

SOUTHERN COPPER CORP/
Form 10-K
March 01, 2019

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**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

FORM 10-K

ý **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE
ACT OF 1934**

For the fiscal year ended: December 31, 2018

OR

o **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES
EXCHANGE ACT OF 1934**

For the transition period from _____ to _____
Commission File Number: 1-14066

SOUTHERN COPPER CORPORATION

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

13-3849074
(I.R.S. Employer
Identification No.)

1440 East Missouri Avenue Suite 160 Phoenix, AZ
(Address of principal executive offices)

85014
(Zip code)

Registrant's telephone number, including area code: **(602) 264-1375**

Securities registered pursuant to Section 12(b) of the Act:

Title of each class:
Common stock, par value \$0.01 per share

Name of each exchange on which registered:

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New York Stock Exchange
Lima Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: **None**

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer

Accelerated filer

Non-accelerated filer

Smaller reporting company

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes No

At February 27, 2019, there were of record 773,044,469 shares of common stock, par value \$0.01 per share, outstanding.

The aggregate market value of the shares of common stock (based upon the closing price at June 30, 2018 as reported on the New York Stock Exchange Composite Transactions) of Southern Copper Corporation held by non-affiliates was approximately \$2,639.1 million.

PORTIONS OF THE FOLLOWING DOCUMENTS ARE INCORPORATED BY REFERENCE:

Part III: Proxy statement for 2019 Annual Meeting of Stockholders

Part IV: Exhibit Index is on Page 150 through 152

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Southern Copper Corporation ("SCC")

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PART I

ITEM 1. BUSINESS

THE COMPANY

Southern Copper Corporation ("SCC", "Southern Copper" or the "Company") is one of the largest integrated copper producers in the world. Our major production includes copper, molybdenum, zinc and silver. All of our mining, smelting and refining facilities are located in Peru and Mexico and we conduct exploration activities in those countries and in Argentina, Chile and Ecuador. See Item 2 "Properties Review of Operations" for maps of our principal mines, smelting facilities and refineries. Our operations make us one of the largest mining companies in Peru and Mexico. We believe we have the largest copper reserves in the world. We were incorporated in Delaware in 1952 and have conducted copper mining operations since 1960. Since 1996, our common stock has been listed on both the New York and Lima Stock Exchanges.

Our Peruvian copper operations involve mining, milling and flotation of copper ore to produce copper concentrates and molybdenum concentrates; the smelting of copper concentrates to produce blister and anode copper; and the refining of anode copper to produce copper cathodes. As part of this production process, we also produce significant amounts of molybdenum concentrate and sulfuric acid. Our precious metals plant at the Ilo refinery produces refined silver, gold, and other materials. Additionally, we produce refined copper using solvent extraction/electrowinning technology ("SX-EW"). We operate the Toquepala and Cuajone open-pit mines high in the Andes Mountains, approximately 860 kilometers southeast of the city of Lima, Peru. We also operate a smelter and refinery west of the Toquepala and Cuajone mines in the coastal city of Ilo, Peru.

Our Mexican operations are conducted through our subsidiary, Minera Mexico, S.A. de C.V. ("Minera Mexico"), which we acquired in 2005. Minera Mexico engages primarily in the mining and processing of copper, molybdenum, zinc, silver, gold and lead. Minera Mexico operates through subsidiaries that are grouped into three separate units. Mexicana de Cobre, S.A. de C.V. (together with its subsidiaries, the "La Caridad" unit) operates La Caridad, an open-pit copper mine, a copper ore concentrator, a SX-EW plant, a smelter, refinery and a rod plant. The La Caridad refinery has a precious metals plant which produces refined silver, gold and other materials. Operadora de Minas e Instalaciones Mineras, S.A de C.V. (the "Buenavista unit") operates Buenavista, an open-pit copper mine, which is located at the site of one of the world's largest copper ore deposits, two copper concentrators and three SX-EW plants. Industrial Minera Mexico, S.A. de C.V. (together with its subsidiaries, the "IMMSA unit") operates five underground mines that produce zinc, lead, copper, silver and gold, a coal mine and a zinc refinery.

We utilize modern, state of the art mining and processing methods, including global positioning systems and computerized mining processes. Our operations have a high level of vertical integration that allows us to manage the entire production process, from the mining of the ore to the production of refined copper rod and other products and most related transport and logistics functions, using our own facilities, employees and equipment.

The sales prices for our products are largely determined by market forces beyond our control. Our management, therefore, focuses on cost control and production enhancement to remain profitable. We endeavor to achieve these goals through capital spending programs, exploration efforts and cost reduction programs. Our focus is to remain profitable during periods of low copper prices and on maximizing results in periods of high copper prices. For additional information on the sale prices of the metals we produce, please see "Metal Prices" in this Item 1.

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Currency Information:

Unless stated otherwise, all our financial information is presented in U.S. dollars and any reference herein to "U.S. dollars", "dollars", or "\$" are to U.S. dollars; references to "sol", "soles" or "S/", are to Peruvian soles; and references to "peso", "pesos", or "Ps.", are to Mexican pesos.

Unit Information:

Unless otherwise noted, all tonnages are in metric tons. To convert to short tons, multiply by 1.102. All ounces are troy ounces. All distances are in kilometers. To convert to miles, multiply by 0.621. To convert hectares to acres, multiply by 2.47.

ORGANIZATIONAL STRUCTURE

The following chart describes our organizational structure, starting with our controlling stockholders, as of December 31, 2018. For clarity of presentation, the chart identifies only our main subsidiaries and eliminates intermediate holding companies.

We are a majority-owned, indirect subsidiary of Grupo Mexico S.A.B. de C.V. ("Grupo Mexico"). At December 31, 2018, Grupo Mexico through its wholly-owned subsidiary Americas Mining Corporation ("AMC") owned 88.9% of our capital stock. Grupo Mexico's principal business is to act as a holding company for the shares of other corporations engaged in the mining, processing, purchase and sale of minerals and other products and railway and other related services.

We conduct our operations in Peru through a registered branch (the "SPCC Peru Branch", "Branch" or "Peruvian Branch"). The SPCC Peru Branch comprises substantially all of our assets and liabilities associated with our copper operations in Peru. The SPCC Peru Branch is not a corporation separate from us and, therefore, obligations of SPCC Peru Branch are direct obligations of SCC and vice-versa. It is, however, an establishment, registered pursuant to Peruvian law, through which we hold assets, incur liabilities and conduct operations in Peru. Although it has neither its own capital nor liability separate from us, it is deemed to have equity capital for purposes of determining the economic interests of holders of our investment shares (See Note 13 "Stockholders' Equity" of our consolidated financial statements).

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In April 2005, we acquired Minera Mexico, from Americas Mining Corporation ("AMC"), a subsidiary of Grupo Mexico, our controlling stockholder. Minera Mexico is a holding company and all of its operations are conducted through subsidiaries that are grouped into three units: (i) the La Caridad unit (ii) the Buenavista unit and (iii) the IMMSA unit. We own 99.96% of Minera Mexico.

In 2008, our Board of Directors ("BOD") authorized a \$500 million share repurchase program that has since been increased by the BOD and is currently authorized to \$3 billion. Pursuant to this program, through December 31, 2018 we have purchased 119.5 million shares of our common stock at a cost of \$2.9 billion. These shares are available for general corporate purposes. We may purchase additional shares from time to time, based on market conditions and other factors. This repurchase program has no expiration date and may be modified or discontinued at any time.

REPUBLIC OF PERU AND MEXICO

Our revenues are derived primarily from our operations in Peru and Mexico. Risks related to our operations in both countries include those associated with economic and political conditions, the effects of currency fluctuations and inflation, the effects of government regulations and the geographic concentration of our operations.

AVAILABLE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the U.S. Securities and Exchange Commission ("SEC"). You may read and copy any document we file at the SEC's Public Reference Room at 100 F Street NE, Washington, D.C. 20549. The SEC maintains a website that contains annual, quarterly and current reports, proxy statements and other information that issuers (including Southern Copper Corporation) file electronically with the SEC. The SEC's website is www.sec.gov.

Our website is www.southerncoppercorp.com. Beginning with the Form 8-K dated March 14, 2003, we have made available on this website, free of charge, our annual, quarterly and current reports, as soon as reasonably practical after we electronically file such material with, or furnish it to, the SEC. Our website also includes the Company's Corporate Governance guidelines and the charters of our principal Board Committees. However, the information found on our website is not part of this or any other report.

CAUTIONARY STATEMENT

Forward-looking statements in this report and in other Company statements include information regarding expected commencement dates of mining or metal production operations, projected quantities of future metal production, anticipated production rates, operating efficiencies, costs and expenditures, including taxes, as well as projected demand or supply for the Company's products. Actual results could differ materially depending upon certain factors, including the risks and uncertainties relating to general U.S. and international economic and political conditions, the cyclical and volatile prices of copper, other commodities and supplies, including fuel and electricity, the availability of materials, insurance coverage, equipment, required permits or approvals and financing, the occurrence of unusual weather or operating conditions, lower than expected ore grades, water and geological problems, the failure of equipment or processes to operate in accordance with specifications, failure to obtain financial assurance to meet closure and remediation obligations, labor relations, litigation and environmental risks, as well as political and economic risk associated with foreign operations. Results of operations are directly affected by metal prices on commodity exchanges, which can be volatile.

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Additional business information follows:

COPPER BUSINESS

Copper is an important component in the world's infrastructure. It is the third most widely used metal, after iron and aluminum. Copper has unique chemical and physical properties, including high ductility, malleability, thermal and electrical conductivity, and resistance to corrosion that has made it a superior material for use in electrical and electronic products, including power transmission and generation, which accounts for about three quarters of copper global use, telecommunications, building construction, transportation and industrial machinery. Copper is also an important metal in non-electrical applications such as plumbing and roofing and, when alloyed with zinc to form brass, in many industrial and consumer applications.

Copper is an internationally traded commodity with prices principally determined by the major metal exchanges, the Commodities Exchange, or "COMEX", in New York and the London Metal Exchange or "LME." Copper is usually found in nature in association with sulfur. Pure copper metal is generally produced from a multistage process, beginning with the mining and concentrating of low-grade ores containing copper sulfide minerals, and followed by smelting and electrolytic refining to produce a pure copper cathode. An increasing share of copper is produced from acid leaching of oxidized ores. Copper is one of the oldest metals ever used and has been one of the most important materials in the development of civilization.

BUSINESS REPORTING SEGMENTS:

Our management views Southern Copper as having three reportable segments and manages it on the basis of these segments.

The three segments identified are groups of individual mines, each of which constitutes an operating segment with similar economic characteristics, type of products, processes and support facilities, regulatory environments, employee bargaining contracts and currency risks. In addition, each mine within the individual group earns revenues from similar types of customers for their products and services and each group incurs expenses independently, including commercial transactions between groups.

Inter-segment sales are based on arm's length prices at the time of sale. These may not be reflective of actual prices realized by the Company due to various factors, including additional processing, timing of sales to outside customers and transportation cost. Added to the segment data is information regarding the Company's sales. The segments identified by the Company are:

1. Peruvian operations, which include the Toquepala and Cuajone mine complexes and the smelting and refining plants, including a precious metals plant, industrial railroad and port facilities that service both mines. Sales of its products are recorded as revenue of our Peruvian mines. The Peruvian operations produce copper, with production of by-products of molybdenum, silver and other materials.
2. Mexican open-pit operations, which include the La Caridad and Buenavista mine complexes and the smelting and refining plants, including a precious metals plant and a copper rod plant and support facilities that service both mines. Sales of its products are recorded as revenue of our Mexican mines. The Mexican open-pit operations produce copper, with production of by-products of molybdenum, silver and other materials.
3. Mexican underground mining operations, which include five underground mines that produce zinc, copper, lead, silver and gold, a coal mine that produces coal and coke, and a zinc refinery. This group is identified as the IMMSA unit and sales of its products are recorded as revenue of the IMMSA unit.

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Financial information is regularly prepared for each of the three segments and the results are reported to Senior management on a segment basis. Senior management focuses on operating income and on total assets as measures of performance to evaluate different segments and to make decisions to allocate resources to the reported segments. These are common measures in the mining industry.

Segment information is included in Item 2 "Properties," under the captions "Metal Production by Segments" and "Ore Reserves." More information on business segment and segment financial information is included in Note 17 "Segment and Related Information" of our consolidated financial statements.

CAPITAL INVESTMENT PROGRAM AND EXPLORATION ACTIVITIES

For a description of our capital investment program, see Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations Capital Investment Program" and for our exploration activities, see Item 2 "Properties Explorations Activities."

PRINCIPAL PRODUCTS AND MARKETS

Copper is primarily used in the building and construction industries, in the power generation and transmission industry, in electrical and electronic products and, to a lesser extent, in industrial machinery and equipment, consumer products and in the automotive and transportation industries. Molybdenum is used to toughen alloy steels and soften tungsten alloy and is also used in fertilizers, dyes, enamels and reagents. Silver is used for photographic, electrical and electronic products and, to a lesser extent, in brazing alloys and solder, jewelry, coinage, silverware and catalysts. Zinc is primarily used as a coating on iron and steel to protect against corrosion and is also used to make die cast parts, in the manufacturing of batteries and in the form of sheets for architectural purposes.

Our marketing strategy and annual sales planning emphasize developing and maintaining long-term customer relationships. Thus acquiring annual or other long-term contracts for the sale of our products is a high priority. Generally, 80% to 90% of our metal production is sold under annual or longer-term contracts. Sales prices are determined based on the prevailing commodity prices for the quotation period according to the terms of the contract.

We focus on the ultimate end-user customers as opposed to selling on the spot market or to trading companies. In addition, we devote significant marketing efforts to diversifying our sales both by region and by customer base. We also strive to provide superior customer service, including timely deliveries of our products. Our ability to consistently fulfill customer demand is supported by our substantial production capacity.

For additional information on sales please see "Revenue recognition" in Note 2 "Summary of Significant Accounting Policies" and Note 17 "Segment and Related Information" of our consolidated financial statements.

METALS PRICES

Prices for our products are principally a function of supply and demand and, with the exception of molybdenum, are established on COMEX and LME. Prices for our molybdenum products are established by reference to the publication Platt's Metals Week. Our contract prices also reflect any negotiated premiums and the costs of freight and other factors. From time to time, we have entered into hedging transactions to provide partial protection against future decreases in the market price of metals and we may do so under certain market conditions. For a further discussion of our products market prices, please see Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations Metal Prices."

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The table below shows the high, low and average COMEX and LME per pound copper prices during the last 10 years:

Year	Copper (COMEX)			Copper (LME)		
	High	Low	Average	High	Low	Average
2009	3.33	1.38	2.35	3.33	1.38	2.34
2010	4.44	2.76	3.43	4.42	2.76	3.42
2011	4.62	3.05	4.01	4.60	3.08	4.00
2012	3.97	3.28	3.61	3.93	3.29	3.61
2013	3.78	3.03	3.34	3.74	3.01	3.32
2014	3.43	2.84	3.12	3.37	2.86	3.11
2015	2.95	2.02	2.51	2.92	2.05	2.50
2016	2.69	1.94	2.20	2.69	1.96	2.21
2017	3.29	2.48	2.80	3.27	2.48	2.80
2018 1st Q	3.24	2.96	3.14	3.27	2.95	3.16
2018 2nd Q	3.29	2.95	3.09	3.29	3.01	3.12
2018 3rd Q	2.93	2.56	2.73	2.99	2.64	2.77
2018 4th Q	2.82	2.63	2.74	2.87	2.69	2.80
2018	3.29	2.56	2.93	3.29	2.64	2.96

The per pound COMEX and LME copper price during the last 5 and 10 year periods averaged \$2.71 and \$3.03, respectively.

The table below shows the high, low and average per-pound, except silver, which is per ounce, market prices for our three principal by-products during the last 10 years:

Year	Silver (COMEX)			Molybdenum (Dealer Oxide Platt's Metals Week)			Zinc (LME)		
	High	Low	Average	High	Low	Average	High	Low	Average
2009	19.30	10.42	14.67	18.00	7.83	10.91	1.17	0.48	0.75
2010	30.91	14.82	20.18	18.60	11.75	15.60	1.14	0.72	0.98
2011	48.58	26.81	35.18	17.88	12.70	15.33	1.15	0.79	0.99
2012	37.14	26.25	31.19	14.80	10.90	12.62	0.99	0.80	0.88
2013	32.41	18.53	23.82	11.95	9.12	10.26	0.99	0.81	0.87
2014	22.05	15.39	19.04	15.05	8.75	11.30	1.10	0.88	0.98
2015	18.35	13.67	15.68	9.40	4.30	6.59	1.09	0.66	0.88
2016	20.67	13.74	17.10	8.60	5.10	6.42	1.32	0.73	0.95
2017	18.49	15.37	17.03	10.25	6.85	8.13	1.53	1.00	1.31
2018 1st Q	17.55	16.12	16.68	13.00	10.70	12.14	1.64	1.06	1.55
2018 2nd Q	17.23	15.95	16.50	12.58	10.60	11.55	1.49	1.31	1.41
2018 3rd Q	16.05	14.04	14.92	12.60	10.63	11.74	1.32	1.04	1.15
2018 4th Q	15.43	13.95	14.51	12.38	11.80	11.99	1.24	1.14	1.19
2018	17.55	13.95	15.65	13.00	10.60	11.86	1.64	1.04	1.33

The per ounce COMEX silver price during the last 5 and 10 year periods averaged \$16.90 and \$20.95, respectively. The per pound Platt's Metals Week Dealer Oxide molybdenum price during the last 5 and 10 year periods averaged \$8.86 and \$10.90, respectively. The per pound LME zinc price during the last 5 and 10 year periods averaged \$1.09 and \$0.99, respectively.

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COMPETITIVE CONDITIONS

Competition in the copper market is based primarily on price and service basis, with price being the most important factor when supplies of copper are ample. Our products compete with other materials, including aluminum and plastics. For additional information, see Item 1A "Risk Factors The copper mining industry is highly competitive."

LABOR FORCE

As of December 31, 2018, we had 13,899 employees, approximately 74% of whom are unionized and represented by nine different labor unions. Despite the three strikes in 2017 at our Peruvian operations, we believe the Company has a positive labor environment in our operations in Mexico and Peru, which is allowing us to increase productivity as well as helping us achieve the goals of our capital expansion program.

Peru

75% of our 4,850 Peruvian employees were unionized at December 31, 2018. Currently, there are six separate unions, one large union and five smaller unions. In the first quarter of 2016, the Company signed three-year agreements with all the existing unions at that time. These agreements included, among other things, annual salary increases of 5% for each of the three years.

In June 2018, the Company signed a three-year collective bargaining agreement with one of the smaller unions. This agreement includes, among other things, annual salary increases of 5% for each year starting September 2018, and a signing bonus of S/ 45,000 (approximately \$13,600) which was recorded as labor expense.

In August 2018, the Company signed a three-year collective bargaining agreement with three additional unions. This agreement includes, among other things, annual salary increases of 5% for each year starting December 2018, and a signing bonus of S/ 45,000 (approximately \$13,600) which was recorded as labor expense.

As of December 31, 2018, the Company continues negotiations on collective bargaining agreements with the two unsigned unions.

Employees of the Toquepala and Cuajone units reside in townsites, where we have built 3,700 houses and apartments. We also have 90 houses at Ilo for staff personnel. Housing, together with maintenance and utility services, is provided at minimal cost to most of our employees. Our townsites and housing complexes include schools, medical facilities, churches, social clubs and recreational facilities. We also provide shopping, banking and other services at the townsites.

Mexico

74% of our 9,002 Mexican employees were unionized at December 31, 2018, represented by three separate unions. Under Mexican law, the terms of employment for unionized workers are set forth in collective bargaining agreements. Mexican companies negotiate the salary provisions of collective bargaining agreements with the labor unions annually and negotiate other benefits every two years. We conduct negotiations separately at each mining complex and each processing plant.

Our Taxco mine in Mexico has been on strike since July 2007. For a discussion of labor matters, refer to the information contained under the caption "Labor matters" in Note 12 "Commitments and Contingencies" of the consolidated financial statements.

Employees of La Caridad and Buenavista units reside in townsites at Nacozari and Cananea, where we have built approximately 2,000 houses and 275 apartments. Most of the employees of the IMMSA unit reside on the grounds of the mining or processing complexes in which they work and

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where we have built approximately 900 houses and apartments. Housing, together with maintenance and utility services, is provided at minimal cost to most of our employees. Our townsites and housing complexes include educational and medical facilities, churches, social clubs, shopping centers, banking and other services. Through 2007, the Buenavista unit provided health care services to employees and retired unionized employees and their families through its own hospital at the Buenavista unit. In 2010, the Company signed an agreement with the Secretary of Health of the State of Sonora to provide these services to its retired workers and their families. The new workers of Buenavista receive health services through the Mexican Institute of Social Security as is the case for all Mexican workers.

FUEL, ELECTRICITY AND WATER SUPPLIES

The principal raw materials used in our operations are fuel, electricity and water. We use natural gas to power boilers and generators, and for metallurgical processes at our Mexican operations and diesel fuel to power mining equipment. We believe that sources of fuel, electricity and water are readily available. The prices of these raw materials may fluctuate outside of our control, therefore we focus our efforts to reduce these costs through cost and energy saving measures.

Energy is the principal cost in mining, so the concern for its conservation and efficient usage is critical. We have energy management committees at most of our mines, which meet periodically to discuss consumption and to develop measures directed at saving energy. Also, alternative sources are being analyzed at the corporate level, from both traditional and renewable energy sources. This has helped us to develop a culture of energy conservation directed at the sustainability of our operations.

Peru:

Fuel: In Peru, we obtain fuel primarily from local companies. The Company believes that adequate supplies of fuel are available in Peru.

Electricity: In June 2014, we entered into a power purchase agreement for 120 megawatt ("MW") with the state company Electroperu S.A., which began supplying energy for our Peruvian operations for twenty years starting on April 17, 2017. In July 2014, we entered into a power purchase agreement for 120MW with a private power generator Kallpa Generacion S.A. ("Kallpa"), which began supplying energy to our Peruvian operations for ten years starting on April 17, 2017. In May 2016, we signed an additional power purchase agreement for a maximum of 80MW with Kallpa, under which Kallpa will supply energy for the operations related to the Toquepala Expansion and other minor projects for ten years starting on May 1, 2017 and ending after ten years of commercial operation of the Toquepala Expansion or on April 30, 2029; whichever occurs first. In addition, we feel confident that additional power can be obtained from the Peruvian national grid, should the need arise.

Additionally, we have nine megawatts of power generation capacity from two small hydro-generating installations at Cuajone. Power is distributed over a 224-kilometer closed loop transmission circuit, which is interconnected with the Peruvian network.

Water: We have water rights or licenses for up to 1,950 liters per second from well fields at the Huaitire, Vizcachas and Titijones aquifers and surface water rights from the Suches lake and two small water courses, Quebrada Honda and Quebrada Tacalaya. We believe these water sources are sufficient to supply the needs of our operating units at Toquepala and Cuajone, including the Toquepala expansion. At Ilo, we have two desalination plants that produce water for industrial use and domestic consumption that we believe are sufficient for our current and projected needs.

Mexico:

Fuel: In Mexico, since 2018, we have purchased fuel from Petroleos Mexicanos ("PEMEX"), the state producer, and from private suppliers.

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The La Caridad unit imports natural gas from the United States through its pipeline (between Douglas, Arizona and Nacozari, Sonora), which allows us to import natural gas from the United States at market prices and thereby reduce operating costs. Several contracts with PEMEX and the United States provide us with the option of using a monthly or daily fixed price for our natural gas purchases.

Natural gas is used for metallurgical processes, to power furnaces, converters, casting wheels, boilers and electric generators. Diesel oil is a backup for all these uses. We use diesel oil to power mining equipment at our operations.

Electricity: Electricity is used as the main energy source at our mining complexes. We purchase most of our electricity from Mexico Generadora de Energia S. de R. L. ("MGE"), a subsidiary of Grupo Mexico which has two power plants designed to supply power to La Caridad and Buenavista units. MGE is supplying 17% of its power output to third party energy users. These plants are natural gas-fired combined cycle power generating units, with a net total capacity of 516.2 megawatts. In 2012, we entered into a power supply agreement with MGE through 2032. The first plant was completed in 2013 and the second was completed in the second quarter of 2014. The first plant began to supply power to the Company in December 2013, and the second plant began to supply power in June 2015.

We also purchase electricity from the *Comision Federal de Electricidad* (the Federal Electricity Commission or the "CFE"), the state's electrical power producer. In addition, we recover some energy from waste heat boilers at the La Caridad smelter. Accordingly, a significant portion of our operating costs in Mexico is dependent upon the pricing policies of CFE, as well as PEMEX, which reflect government policy, as well as international market prices for crude oil, natural gas and conditions in the refinery markets.

Some mining operations of IMMSA also purchase electricity from Eolica el Retiro, S.A.P.I de C.V. ("Eolica"), a windfarm energy producer that is an indirect subsidiary of Grupo Mexico. In August 2013, IMMSA and other of the mining operations of the Company entered into a purchase agreement and in late 2014 started to purchase electricity from Eolica. Due to the nature of the production process there is not a fixed power capacity contracted. In 2018, the total purchases were approximately 41.7 million kilowatt hours.

Water: In Mexico, water is deemed a public property and industries not connected to a public service water supply must obtain a water concession from *Comision Nacional del Agua* (the National Water Commission or the "CNA"). Water usage fees are established in the *Ley Federal de Derechos* (the Federal Rights Law), which distinguishes several availability zones with different fees per unit of volume according to each zone, with the exception of Mexicana de Cobre. All of our operations have one or several water concessions and pump out the required water from wells. Mexicana de Cobre pumps water from the La Angostura dam, which is close to the mine and plants. At our Buenavista facility, we maintain our own wells and pay the CNA for water usage. Water conservation committees have been established in each plant in order to conserve and recycle water. Water usage fees are updated on a yearly basis and have been increasing in recent years.

ENVIRONMENTAL MATTERS

For a discussion of environmental matters reference is made to the information contained under the caption "Environmental matters" in Note 12 "Commitments and Contingencies" of the consolidated financial statements.

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MINING RIGHTS AND CONCESSIONS

Peru:

We have 125,700 hectares in concessions from the Peruvian government for our exploration, exploitation, extraction and production operations, at various sites, as follows:

	Toquepala	Cuajone	Ilo	Other	Total
	(hectares)				
Plants	360	919	421		1,700
Operations	23,781	21,555	4,483	36,559	86,378
Exploration				37,622	37,622
Total	24,141	22,474	4,904	74,181	125,700

We believe that our Peruvian concessions are in full force and in effect under applicable Peruvian laws and that we are in compliance with all material terms and requirements applicable to these concessions. The concessions have indefinite terms, subject to our payment of concession fees of up to \$3.00 per hectare annually for the mining concessions and a fee based on nominal capacity for the processing concessions. Fees paid during 2018, 2017 and 2016, were approximately \$1.5 million, \$1.2 million and \$1.3 million, respectively. We have two types of mining concessions in Peru: metallic and non-metallic concessions.

In 2011, the Peruvian Congress approved an amendment to the mining royalty charge. The new mining royalty charge is based on operating income margins with graduated rates ranging from 1% to 12% of operating profits, with a minimum royalty charge assessed at 1% of net sales. If the operating income margin is 10% or less, the royalty charge is 1% and for each 5% increment in the operating income margin, the royalty charge rate increases by 0.75%, up to a maximum of 12%. In 2018, 2017 and 2016, we made provisions of \$32.9 million, \$23.4 million and \$16.8 million, respectively.

At the same time the Peruvian Congress amended the mining royalty charge, it enacted a new tax for the mining industry. This tax is also based on operating income and its rates range from 2% to 8.4%. For additional information see Note 7 "Income Taxes" to the consolidated financial statements.

Mexico:

In Mexico we have 534,400 hectares in concessions from the Mexican government for our exploration and exploitation activities as outlined on the table below.

	IMMSA	La Caridad	Buenavista	Projects	Total
	(hectares)				
Mine concessions	188,899	103,821	93,706	147,974	534,400

We believe that our Mexican concessions are in full force and in effect under applicable Mexican laws and that we are in compliance with all material terms and requirements applicable to these concessions. Under Mexican law, mineral resources belong to the Mexican nation and a concession from the Mexican federal government is required to explore or mine mineral reserves. Mining concessions have a 50-year term that can be renewed for another 50 years. Holding fees for mining concessions can be from \$0.36 to \$7.82 per hectare depending on the beginning date of the mining concession. Fees paid during 2018, 2017 and 2016 were approximately \$6.3 million, \$5.8 million and \$5.4 million, respectively. In addition, all of our operating units in Mexico have water concessions that are in full force and effect. Although ownership is not required in order to explore or mine a concession, we generally own the land related to our Mexican concessions. We also own all of the processing facilities of our Mexican operations and the land on which they are constructed.

In December 2013, the Mexican government enacted a new law which, among other things, established a mining royalty charge of 7.5% on earnings before taxes as defined by Mexican tax regulations and an additional royalty charge of 0.5% over gross income from sales of gold, silver and platinum. These charges were effective January 2014 and are deductible for income tax purposes.

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ITEM 1A. RISK FACTORS

Every investor or potential investor in Southern Copper Corporation should carefully consider the following risk factors.

Financial risks

Our financial performance is highly dependent on the price of copper and the other metals we produce.

Our financial performance is significantly affected by the market prices of the metals that we produce, particularly the market prices of copper, molybdenum, zinc and silver. Historically, these prices have been subject to wide fluctuations and are affected by numerous factors out of our control, including international economic and political conditions, levels of supply and demand, the availability and costs of substitutes, inventory levels maintained by users, actions of participants in the commodities markets and currency exchange rates. In addition, the market prices of copper and certain other metals have on occasion been subject to rapid short-term changes.

In the last three years, approximately 80% of our revenues came from the sale of copper, 6% from molybdenum and 10% from silver and zinc. Please see the distribution of our revenues per product on Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" caption "Results of operations net sales" on page 79.

See also historical average price of our products on Item 1 Business caption "Metals prices".

We cannot speculate whether metals prices will rise or fall in the future. Future declines in metals prices, and in particular copper, will have an adverse impact on our results of operations and financial condition. In very adverse market conditions, we might consider curtailing or modifying some of our mining and processing operations.

Our business requires levels of capital investments which we may not be able to maintain.

Our business is capital intensive. Specifically, the exploration and exploitation of copper and other metal reserves, mining, smelting and refining costs, the maintenance of machinery and equipment and compliance with laws and regulations require significant capital investments. We must continue to invest capital to maintain or increase the amount of copper reserves that we exploit and the amount of copper and other metals we produce. We cannot assure you that we will be able to maintain our production levels to generate sufficient cash, or that we have access to sufficient financing to continue our exploration, exploitation and refining activities at or above present levels.

Restrictive covenants in the agreements governing our indebtedness and the indebtedness of our Minera Mexico subsidiary may restrict our ability to pursue our business strategies.

Our financing instruments and those of our Minera Mexico subsidiary include financial and other restrictive covenants that, among other things, limit our and Minera Mexico's abilities to incur additional debt and sell assets. If either we or our Minera Mexico subsidiary do not comply with these obligations, we could be in default under the applicable agreements which, if not addressed or waived, could require repayment of the indebtedness immediately. Our Minera Mexico subsidiary is further limited by the terms of its outstanding notes, which also restrict the Company's applicable incurrence of debt and liens. In addition, future credit facilities may contain limitations on our incurrence of additional debt and liens, on our ability to dispose of assets, or on our ability to pay dividends to our common stockholders.

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We may not pay a significant amount of our net income as cash dividends on our common stock in the future.

We distributed a significant amount of our net income as dividends since 1996. Our dividend practice is subject to change at the discretion of our Board of Directors at any time. The amount that we pay in dividends is subject to a number of factors, including our results of operations, financial condition, cash requirements, tax considerations, future prospects, legal restrictions, contractual restrictions in credit agreements, limitations imposed by the government of Peru, Mexico or other countries where we have significant operations and other factors that our Board of Directors may deem relevant. In light of our capital investment program and global economic conditions, it is possible that future dividend distributions will be reduced from the levels of recent years.

Our ability to recognize the benefits of deferred tax assets is dependent on future cash flows and taxable income.

Through 2018, the Company recognized the expected future tax benefit from deferred tax assets when the tax benefit was considered to be more likely than not of being realized, otherwise, a valuation allowance was applied against deferred tax assets. Assessing the recoverability of deferred tax assets requires management to make significant estimates related to expectations of future taxable income and existing tax laws and there can be no assurance that the Company will be able to recognize the expected future benefits of deferred tax assets; such inability could have a material adverse effect on the Company's results of operations. For more information on the effects of U.S. Tax Reform, please see Note 7 "Income Taxes".

Operational risks

Our actual reserves may not conform to our current estimates of our ore deposits and we depend on our ability to replenish ore reserves for our long-term viability.

There is a degree of uncertainty attributable to the calculation of reserves. Until reserves are actually mined and processed, the quantity of ore and grades must be considered as estimates only. The proven and probable ore reserves data included in this report are estimates prepared by us based on evaluation methods generally used in the mining industry. We may be required in the future to revise our reserves estimates based on our actual production. We cannot assure you that our actual reserves conform to geological, metallurgical or other expectations or that the estimated volume and grade of ore will be recovered. Market prices of our metals, increased production costs, reduced recovery rates, short-term operating factors, royalty charges and other factors may render proven and probable reserves uneconomic to exploit and may result in revisions of reserves data from time to time. Reserves data are not indicative of future results of operations. Our reserves are depleted as we mine. We depend on our ability to replenish our ore reserves for our long-term viability. We use several strategies to replenish and increase our ore reserves, including exploration and investment in properties located near our existing mine sites and investing in technology that could extend the life of a mine by allowing us to cost-effectively process ore types that were previously considered uneconomic. Acquisitions may also contribute to increase ore reserves and we review potential acquisition opportunities on a regular basis. However, we cannot assure you that we will be able to continue with our strategy to replenish reserves indefinitely.

Our operations are subject to risks, some of which are not insurable.

The business of mining, smelting and refining copper, zinc and other metals is subject to a number of risks and hazards, including industrial accidents, labor disputes, unusual or unexpected geological conditions, changes in the regulatory environment, environmental hazards, weather and other natural phenomena, such as seismic activity, wall failures and rock slides in our open-pit mines, structural

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collapses of our underground mines or tailings impoundments, and lower than expected ore grades or recovery rates. The Company's operations may also be affected by mudslides and flash floods caused by torrential rains.

Such occurrences could result in damage to, or destruction of, mining operations resulting in monetary losses and possible legal liability. In particular, surface and underground mining and related processing activities present inherent risks of injury to personnel, loss of life and damage to equipment.

The waste rock and tailings produced in our mining operations represent our largest volume of waste material. Managing the volume of waste rock and tailings presents significant environmental, safety and engineering challenges and risks. We maintain large tailings impoundments containing sand of ground rock, moistened with water, which are effectively large dams that must be engineered, constructed and monitored to assure structural stability and avoid leakages or structural collapse. The failure of tailings and other impoundments at any of our mining operations could cause severe property and environmental damage and loss of life. The importance of careful design, management and monitoring of large impoundments was emphasized in recent years by large scale tailings dam failures at unaffiliated mines, which caused extensive property and environmental damage and resulted in the loss of life. For more information regarding our tailing dams, please see Item 2 "Properties Slope Stability Tailing Dams."

We maintain insurance against many of these and other risks, which in certain circumstances may not provide adequate coverage. Insurance against certain risks, including certain liabilities for environmental damage or hazards as a result of exploration and production, is not generally available to us or other companies within the mining industry. Nevertheless recent environmental legal initiatives have considered future regulations regarding environmental damage insurance. In case such regulations come into force, we will have to analyze the need to obtain such insurance. We do not have, and do not intend to obtain, political risk insurance. We cannot assure you that these and other uninsured events will not have an adverse effect on our business, properties, operating results, financial condition or prospects.

Changes in the demand level for our products and copper sales agreements could adversely affect our revenues.

Our financial results are subject to fluctuations on the level of industrial and consumer demand for the refined, semi-refined metal products and concentrates we sell, as well as global economic slow-downs or recessions. Also, changes in technology, industrial processes, concerns over weaknesses in the global economy and consumer habits may affect the level of demand to the extent that those increase or decrease the need for our metal products. Likewise, our revenues could be adversely affected by events of force majeure that could have a negative impact on our sales agreements. These events include acts of nature, labor strikes, fires, floods, wars, transportation delays, government actions or other events that are beyond the control of the parties of the agreement.

Interruptions of energy supply or increases in energy costs, shortages of water supply, critical parts, equipment, skilled labor and other production costs may adversely affect our results of operations.

We require substantial amounts of fuel oil, electricity, water and other resources for our operations. Fuel, gas and power costs constituted approximately 29%, 31% and 30% of our total production cost in 2018, 2017 and 2016, respectively. We rely upon third parties for our supply of the energy resources consumed in our operations so that prices for and availability of energy resources may be subject to change or curtailment, due to, among other things, new laws or regulations, imposition of new taxes or tariffs, interruptions in production by suppliers, worldwide price levels and market conditions. Regarding water consumption, although each operation currently has sufficient water rights to cover its operational demands, the loss of some or all water rights for any of our mines or

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operations, in whole or in part, or shortages of water to which we have rights could require us to curtail or shut down mining production and could prevent us from pursuing expansion opportunities. In addition, future shortages of critical parts, equipment and skilled labor could adversely affect our operations and development projects.

Our Company is subject to health and safety laws which may restrict our operations, result in operational delays or increase our operating costs and adversely affect our financial results of operations.

We are required to comply with occupational health and safety laws and regulations in Peru and Mexico where our operations are subject to periodic inspections by the relevant governmental authorities. These laws and regulations govern, among others, health and safety work place conditions, including high risk labor and the handling, storage and disposal of chemical and other hazardous substances. We believe our operations are in compliance in all material respects with applicable health and safety laws and regulations in the countries in which we operate. Compliance with these laws and regulations and new or existing regulations that may be applicable to us in the future could increase our operating costs and adversely affect our financial results of operations and cash flows.

Our efforts are focused on the health and safety of our workforce in order to consistently improve performance and compliance through the implementation of occupational health programs, adequate training and safety incentives at our operations. Despite the Company's efforts, we are not exempt from accidents. These are reported to Mexican and Peruvian authorities as required. Regarding non-fatal accidents, in the last three years, the Company's Dart rate (rate to measure workplace injuries severe enough to warrant Day Away from work, job Restrictions and/or job Transfers) was much lower than the MSHA Dart rate (the MSHA Dart rate is published by the U.S.'s Mine Safety and Health Administration, and is used as an industry benchmark).

In 2018, we did not have fatalities; but in 2017 and 2016 we had two and six fatalities, respectively, in Mexico and Peru. The amounts paid to the Mexican and Peruvian authorities for reportable accidents did not have an adverse effect on our results. Under Mexican and Peruvian law penalties and fines for safety violations are generally monetary, but in certain cases may lead to the temporary or permanent shutdown of the affected facility or the suspension or revocation of permits or licenses. Also, violations of security and safety laws and regulations in our Peruvian operations can be considered a crime, punishable with a sentence of up to 10 years of prison.

Our metals exploration efforts are highly speculative in nature and may be unsuccessful.

Metals exploration is highly speculative in nature. It involves many risks and is frequently unsuccessful. Once mineralization is discovered, it may take a number of years from the initial phases of drilling until production is possible, during which time the economic feasibility of production may change. Substantial expenditures are required to establish proven and probable ore reserves through drilling, to determine metallurgical processes to extract the metals from the ore and, in the case of new properties, to construct mining and processing facilities. We cannot assure you that our exploration programs will result in the expansion or replacement of current production with new proven and probable ore reserves.

Development projects have no operating history upon which we can base estimates of proven and probable ore reserves and estimates of future cash operating costs. Estimates are, to a large extent, based upon the interpretation of geological data obtained from drill holes and other sampling techniques, and feasibility studies that derive estimates of cash operating costs based upon anticipated tonnage and grades of ore to be mined and processed, the configuration of the ore body, expected recovery rates of the mineral from the ore, comparable facility and equipment operating costs, anticipated climatic conditions and other factors. As a result, actual cash operating costs and economic returns based upon development of proven and probable ore reserves may differ significantly from

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those originally estimated. Moreover, significant decreases in actual or expected prices may mean reserves, once found, will be uneconomical to produce.

We may be adversely affected by challenges relating to slope stability.

Our open-pit mines get deeper as we mine them, presenting certain geotechnical challenges including the possibility of slope failure. If we are required to decrease pit slope angles or provide additional road access to prevent such a failure, our stated reserves could be negatively affected. Furthermore, hydrological conditions relating to pit slopes, renewal of material displaced by slope failures and increased stripping requirements could also negatively affect our stated reserves. We have taken actions in order to maintain slope stability, but we cannot assure you that we will not have to take additional action in the future or that our actions taken to date will be sufficient. Unexpected failure or additional requirements to prevent slope failure may negatively affect our results of operations and financial condition, as well as have the effect of diminishing our stated ore reserves.

We may be adversely affected by labor disputes.

In the last several years we have experienced a number of strikes or other labor disruptions that have had an adverse impact on our operations and operating results. As of December 31, 2018, unions represented approximately 74% of our workforce. Currently, we have labor agreements in effect for our Mexican and Peruvian operations.

During 2017, the Unified Labor Union of SPCC workers and one of Toquepala's unions held three separate strikes. The Company estimates that the loss of copper production resulting from the 2017 strikes was not significant and our sales contracts were not affected.

Our Taxco mine in Mexico has been on strike since July 2007. It is expected that operations at this mine will remain suspended until these labor issues are resolved. In addition, the workers of the San Martin mine were on strike from July 2007 to August 2018 and the Company is now working on a rehabilitation plan to restart operations at the San Martin mine with a budget of \$77 million. For additional information, see Item 2, "Properties Mexican IMMSA Unit San Martin and Taxco", and Note 12, "Commitments and Contingencies Labor matters", to our consolidated financial statements.

We cannot assure you when the pending strike will be settled, or that in the future we will not experience strikes or other labor related work stoppages that could have a material adverse effect on our financial condition and results of operations.

Our mining or metal production projects may be subject to additional costs due to community actions and other factors.

In recent years, worldwide mining activity has been pressured by neighboring communities for financial commitments to fund social benefit programs and infrastructure improvements. Our projects in Peru are not exempt from these pressures. Our Tia Maria project in Peru has experienced delays while trying to resolve issues with community groups.

It appears that it is becoming a part of the Peruvian mining environment that in order to obtain acceptance from local communities for projects in their localities, demands for substantial investments in community infrastructure and upgrades must be met in order to proceed with the mining projects.

We are confident that we will move forward with the Tia Maria project. However, we cannot assure you when and that we will not continue to incur additional costs for community infrastructure and upgrades in order to obtain the approval of current or future mining projects.

In addition, there are a number of collective action lawsuits and civil action lawsuits, filed against the Company in Mexico's federal courts and the state courts of Sonora. A number of constitutional

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lawsuits have also been filed against various governmental authorities and against the Company. These lawsuits are seeking damages and requesting remedial actions to restore the environment. The Company believes that it is not possible to determine the extent of the damages sought and considers the lawsuits without merit. However the Company cannot offer any assurances that the outcome of these lawsuits will not have an adverse effect on the Company.

Environmental, regulatory response to climate change, and other regulations may increase our costs of doing business, restrict our operations or result in operational delays.

Our exploration, mining, milling, smelting and refining activities are subject to a number of Peruvian and Mexican laws and regulations, including environmental laws and regulations, and certain industry technical standards. Additional matters subject to regulation include, but are not limited to, concession fees, transportation, production, water use and discharge, power use and generation, use and storage of explosives, surface rights, housing and other facilities for workers, reclamation, taxation, labor standards, mine safety and occupational health.

Environmental regulations in Peru and Mexico have become increasingly stringent over the last decade and we have been required to dedicate more time and money to compliance and remediation activities. Furthermore, the Mexican authorities have become more rigorous and strict in enforcing Mexican environmental laws. We expect additional laws and regulations will be enacted over time with respect to environmental matters.

Please refer to Note 12 "Commitments and Contingencies Environmental matters" of our financial statements for further information on this subject.

The potential physical impacts of climate change on our operations are highly uncertain, and would be particular to the geographic location of our facilities. These may include changes in rainfall patterns, water shortages, changing sea levels, changing storm patterns and intensities, and changing temperatures. These effects may adversely impact the cost, production and financial performance of our operations.

We are aware of fluctuations in weather patterns in the areas where we operate. Aligned with government efforts, we are working in measuring its carbon footprint in order to reduce any contribution to greenhouse gases generated by our operations. Similarly, we evaluate our water demand, as weather changes may result in increase/decrease scenarios that affect our needs.

The development of more stringent environmental protection programs in Peru and Mexico and in relevant trade agreements could impose constraints and additional costs on our operations requiring us to make significant investments in the future. We cannot assure you that current or future legislative, regulatory or trade developments will not have an adverse effect on our business, properties, operating results, financial condition or prospects.

Our mining and metal production projects may subject us to new risks.

Our Company is in the midst of a large expansion program, which may subject us to additional risks of industrial accidents. While we believe our contractors employ safety standards and other procedures to ensure these projects are completed with proper governance, it is possible that the increased activity occurring at our sites could cause accidents of an environmental nature or danger to human life.

In August 2014, our new SX-EW plant in Mexico had an industrial accident caused by a rock slide, coupled with a construction defect in the seal of a pipe at the new leaching system containment dam, which caused a spill of copper sulfate solution into the Bacanuchi River, a tributary of the Sonora River. As a result of this accident the Company absorbed charges of \$126.2 million through 2017. While this is an unusual event in the Company's history, we cannot offer assurance that an accident

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related to our project development program will not occur again in the future and cause environmental damage or damage that causes harm or loss of life.

Our business depends upon information technology systems which may be adversely affected by disruptions, damage, failure and risks associated with implementation and integration.

Our operations depend upon information technology systems which may be subject to disruption, damage or failure from different sources, including, without limitation, installation of malicious software, computer viruses, security breaches, cyber-attacks and defects in design. In recent years, cybersecurity incidents have increased in frequency and include, but are not limited to, malicious software, attempts to gain unauthorized access to data and other electronic security breaches that could lead to disruptions in systems, unauthorized release of confidential or otherwise protected information and the corruption of data.

However, given the unpredictability of the timing, nature and scope of information technology disruptions, we could potentially be subject to manipulation or improper use of our systems and networks, operational delays, the compromising of confidential or otherwise protected information, destruction or corruption of data, security breaches, financial losses from remedial actions, any of which could have a material adverse effect on our cash flows, competitive position, financial condition or results of operations.

Other risks

Applicable law restricts the payment of dividends from our Minera Mexico subsidiary to us.

Our subsidiary, Minera Mexico, is a Mexican company and, as such, may pay dividends only out of net income that has been approved by the shareholders. Shareholders must also approve the actual dividend payment, after mandatory legal reserves have been created and losses for prior fiscal years have been satisfied. These legal constraints may limit the ability of Minera Mexico to pay dividends to us, which in turn, may have an impact on our ability to pay stockholder dividends or to service debt.

Global and local market conditions, including the high competitiveness in the copper mining industry, may adversely affect our profitability.

Our industry is cyclical by nature and fluctuates with economic cycles. Therefore, we are subject to the risks arising from adverse changes in domestic and global economic and political conditions, such as lower levels of consumer and corporate confidence, decreased business investment, increased unemployment, reduced income and asset values in many areas, currency volatility and limited availability of credit and access to capital. Additionally, we face competition from other copper mining and producing companies around the world; significant competition exists to acquire properties producing or capable of producing copper and other metals as well as consolidation among some of our main competitors that make them more diversified than we are.

We cannot assure you that changes in market conditions, including competition, will not adversely affect us to compete in the future on the basis of price or other factors with companies that may benefit from future favorable trading or other arrangements.

We are controlled by Grupo Mexico, which exercises control over our affairs and policies and whose interests may be different from yours.

At December 31, 2018, Grupo Mexico owned indirectly 88.9% of our capital stock. Certain of our and Minera Mexico's officers and directors are also directors and/or officers of Grupo Mexico and/or of its affiliates. We cannot assure you that the interests of Grupo Mexico will not conflict with our minority stockholders.

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Grupo Mexico has the ability to determine the outcome of substantially all matters submitted for a vote to our stockholders and thus exercises control over our business policies and affairs, including the following:

the composition of our Board of Directors and, as a result, any determinations of our Board with respect to our business direction and policy, including the appointment and removal of our officers;

determinations with respect to mergers and other business combinations, including those that may result in a change of control;

whether dividends are paid or other distributions are made and the amount of any dividends or other distributions;

sales and dispositions of our assets;

the amount of debt financing that we incur; and

the approval of capital projects.

We cannot assure you that increased financial obligations of Grupo Mexico or AMC resulting from financings or for other reasons will not result in our parent corporations obtaining loans, increased dividends or other funding from us.

In addition, we have in the past engaged in, and expect to continue to engage in, transactions with Grupo Mexico and its other affiliates which are related party transactions and may present conflicts of interest. For additional information regarding the share ownership of, and our relationships with, Grupo Mexico and its affiliates, see Note 16 "Related Party Transactions."

Unanticipated litigation or negative developments in pending litigation or with respect to other contingencies may adversely affect our financial condition and results of operations.

We are currently, and may in the future become, subject to litigation, arbitration or other legal proceedings with other parties. If decided adversely to the Company, these legal proceedings, or others that could be brought against us in the future, may adversely affect our financial position or prospects. For further detailed discussion of pending litigation, please see Note 12 "Commitment and Contingencies - Litigation matters".

Developments in the United States, Europe and emerging market countries may adversely affect the Company business, our common stock price and our debt securities.

The business and market value of securities of companies with significant operations in Peru and Mexico is, to varying degrees, affected by the economic policies and market conditions in the United States, Europe and emerging market countries. Although economic policies and conditions in such countries may significantly differ from economic conditions in Peru or Mexico, as the case may be, the business community reactions to developments in any of these countries may adversely effect the Company business or the market value or trading price of the securities, including debt securities, of issuers that have significant operations in Peru or Mexico.

In addition, in recent years economic conditions in Mexico have increasingly become correlated to U.S. economic conditions. Therefore, changes in economic policies and conditions in the United States could also have a significant adverse effect on Mexican economic conditions, affecting our business, the price of our common stock or debt securities. In 2017, the United States, Canada and Mexico began a discussion leading towards an update of the North American Free Trade Agreement ("NAFTA"). In September 2018, the three countries reached an agreement on a new trade deal, which will be known

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as the United States Mexico Canada Agreement ("USMCA"). This was signed in November 2018 and is pending approval by the legislatures of each country.

In addition, rising trade tensions between the U.S. and China and efforts by the Chinese government to reduce debt levels contributed to a recent slowdown in China's growth. A continued slowing in China's economic growth and copper demand and continued trade tensions between the U.S. and China could result in lower copper prices which could have a material adverse impact on our business and results of operations. The adoption and expansion of trade restrictions, changes in the state of China-U.S. relations, including the current trade tensions, or other governmental action related to tariffs or trade agreements or policies are difficult to predict and could adversely affect demand for our products, our costs, our customers, our suppliers, and the U.S. economy, which in turn could have a material adverse effect on our cash flows, competitive position, financial condition or results of operations.

We cannot assure you that the market value or trading prices of our common stock and debt securities, will not be adversely affected by events in the United States or elsewhere, including in emerging market countries.

Other international risks.

We are a company with substantial assets located outside of the United States. We conduct production operations in Peru and Mexico and exploration activities in these countries as well as in Chile, Argentina and Ecuador. Accordingly, in addition to the usual risks associated with conducting business in foreign countries, our business may be adversely affected by political, economic and social uncertainties in each of these countries. Such risks include possible expropriation or nationalization of property, confiscatory taxes or royalties, possible foreign exchange controls, changes in the national policy toward foreign investors, extreme environmental standards, etc.

Our international operations must comply with the U.S. Foreign Corrupt Practices Act and similar anti-corruption and anti-bribery laws of the other jurisdictions in which we operate. There has been a substantial increase in the global enforcement of these laws in recent years. As such, our corporate policies and processes may not prevent or detect all potential breaches of law. Any violation of those laws could result in significant criminal or civil fines and penalties, litigation, and loss of operating licenses or permits, and may damage our reputation, which could have a material adverse effect on our cash flows, results of operations and financial condition.

Our insurance does not cover most losses caused by the above described risks. Consequently, our production, development and exploration activities in these countries could be substantially affected by factors out of control, some of which could materially and adversely affect our financial position or results of operations.

Risks Associated with Doing Business in Peru and Mexico

There is uncertainty as to the termination and renewal of our mining concessions.

Under the laws of Peru and Mexico, mineral resources belong to the state and government and concessions are required in both countries to explore for or exploit mineral reserves. In Peru, our mineral rights derive from concessions from Ministry of Energy and Mines ("MINEM") for our exploration, exploitation, extraction and/or production operations. In Mexico, our mineral rights derive from concessions granted, on a discretionary basis, by the Ministry of Economy, pursuant to Mexican mining law and regulations thereunder.

Mining concessions in both Peru and Mexico may be terminated if the obligations of the concessioner are not satisfied. In Peru, we are obligated to pay certain fees for our mining concession. In Mexico, we are obligated, among other things, to explore or exploit the relevant concession, to pay

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any relevant fees, to comply with all environmental and safety standards, to provide information to the Ministry of Economy and to allow inspections by the Ministry of Economy. Any termination or unfavorable modification of the terms of one or more of our concessions, or failure to obtain renewals of such concessions subject to renewal or extensions, could have a material adverse effect on our financial condition and prospects.

Peruvian economic and political conditions may have an adverse impact on our business.

A significant part of our operations are conducted in Peru. Accordingly, our business, financial condition or results of operations could be affected by changes in economic or other policies of the Peruvian government or other political, regulatory or economic developments in the country. During the past several decades, Peru has had a succession of regimes with differing policies and programs. Past governments have frequently intervened in the nation's economy and social structure. Among other actions, past governments have imposed controls on prices, exchange rates and local and foreign investments, as well as limitations on imports, have restricted the ability of companies to dismiss employees and have prohibited the remittance of profits to foreign investors.

In 2018 Peru experienced heightened political instability derived from various currently ongoing investigations into allegations of money laundering and corruption linked to the Operation Car Wash investigation that was initiated by Brazilian authorities. Because we have significant operations in Peru, we cannot provide any assurance that political developments and economic conditions, including any changes to economic policies or the adoption of other reforms proposed by existing or future administrations, in Peru and/or other factors will not have a material adverse effect on market conditions, prices of our securities, our ability to obtain financing and our results of operations and financial condition.

Mexican economic and political conditions, as well as drug-related violence, may have an adverse impact on our business.

The Mexican economy is highly sensitive to economic developments in the United States, mainly because of its high level of exports to this market. Other risks in Mexico are increases in taxes on the mining sector and higher royalties as were enacted in 2013. As has occurred in other metal producing countries, the mining industry may be perceived as a source of additional fiscal revenue.

In addition, security institutions in Mexico are under significant stress, as a result of drug-related violence. This situation creates potential risks especially for transportation of minerals and finished products, which affect a small part of our production. However, drug-related violence has had a limited impact on our operations as it has tended to concentrate outside our areas of production. The potential risks to our operations might increase if the violence was to spread to our areas of production.

Because we have significant operations in Mexico, we cannot provide any assurance that political developments and economic conditions, including any changes to economic policies or the adoption of other reforms proposed by existing or future administrations, or drug-related violence, in Mexico will not have a material adverse effect on market conditions, prices of our securities, on our ability to obtain financing, and on our results of operations and financial condition.

Peruvian inflation and fluctuations in the sol exchange rate may adversely affect our financial condition and results of operations.

Although the U.S. dollar is our functional currency and our revenues are primarily denominated in U.S. dollars, as we operate in Peru, portions of our operating costs are denominated in Peruvian soles. Accordingly, when inflation or deflation in Peru is not offset by a change in the exchange rate of the sol, our financial position, results of operations, cash flows and the market price of our common stock could be affected.

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Inflation in Peru in 2018, 2017 and 2016 was 2.5%, 1.5% and 3.2%, respectively. The value of the sol depreciated against the U.S. dollar 4.1% in 2018, and it appreciated 3.4% and 1.6% in 2017 and 2016, respectively. Although the Peruvian government's economic policy reduced inflation and the economy has experienced significant growth in recent years, we cannot assure you that inflation will not increase from its current level or that such growth will continue in the future at similar rates or at all. Additionally a global financial economic crisis could negatively affect the Peruvian economy.

To manage the volatility related to the risk of currency rate fluctuations, we may enter into forward exchange contracts. We cannot assure you, however, that currency fluctuations will not have an impact on our financial condition and results of operations.

Mexican inflation, restrictive exchange control policies and fluctuations in the peso exchange rate may adversely affect our financial condition and results of operations.

Although all of our Mexican operations' sales of metals are priced and invoiced in U.S. dollars, a substantial portion of its costs are denominated in pesos. Accordingly, when inflation in Mexico increases without a corresponding depreciation of the peso, the net income generated by our Mexican operations is adversely affected. The annual inflation rate in Mexico was 4.8% in 2018, 6.8% in 2017 and 3.4% in 2016.

At the same time, the peso has been subject in the past to significant volatility, which may not have been proportionate to the inflation rate and may not be proportionate to the inflation rate in the future. The value of the peso relative to the U.S. dollar increased by 0.3% and 4.5% in 2018 and 2017, and decreased by 20.1% in 2016.

The Mexican government does not currently restrict the ability of Mexican companies or individuals to convert pesos into dollars or other currencies. While we do not expect the Mexican government to impose any restriction or exchange control policies in the future, it is an area we closely monitor. We cannot assure you the Mexican government will maintain its current policies with regard to the peso or that the peso's value will not fluctuate significantly in the future. The imposition of exchange control policies could impair Minera Mexico's ability to obtain imported goods and to meet its U.S. dollar-denominated obligations and could have an adverse effect on our business and financial condition.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

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ITEM 2. PROPERTIES

We were incorporated in Delaware in 1952. Our corporate offices in the United States are located at 1440 East Missouri Avenue Suite 160, Phoenix, Arizona 85014. Our Phoenix telephone number is (602) 264-1375. Our corporate offices in Mexico are located in Mexico City and our corporate offices in Peru are located in Lima. Our website is www.southerncoppercorp.com. We believe that our existing properties are in good condition and suitable for the conduct of our business.

REVIEW OF OPERATIONS

The following maps set forth the locations of our principal mines, smelting facilities and refineries. We operate open-pit copper mines in the southern part of Peru at Toquepala and Cuajone and in Mexico, at La Caridad and Buenavista. We also operate five underground mines that produce zinc, copper, silver and gold, as well as a coal mine and a coke oven.

EXTRACTION, SMELTING AND REFINING PROCESSES

Our operations include open-pit and underground mining, concentrating, copper smelting, copper refining, copper rod production, solvent extraction/electrowinning ("SX-EW"), zinc refining, sulfuric acid production, molybdenum concentrate production and silver and gold refining. The extraction and production process are summarized below.

OPEN-PIT MINING

In an open-pit mine, the production process begins at the mine pit, where waste rock, leaching ore and copper ore are drilled and blasted and then loaded onto diesel-electric trucks by electric shovels. Waste is hauled to dump areas and leaching ore is hauled to leaching dumps. The ore to be milled is transported to the primary crushers.

UNDERGROUND MINING

In an underground mine, the production process begins at the stopes, where copper, zinc and lead veins are drilled and blasted and the ore is hauled to the underground crusher station. The crushed ore is then hoisted to the surface for processing.

CONCENTRATING

The copper ore with a copper grade over 0.4% from the primary crusher or the copper, zinc and lead-bearing ore from the underground mines is transported to a concentrator plant where gyratory

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crushers break the ore into sizes no larger than three-quarter of an inch. The ore is then sent to a mill section where it is ground to the consistency of fine powder. The finely ground ore is mixed with water and chemical reagents and pumped as a slurry to the flotation separator where it is mixed with certain chemicals. In the flotation separator, reagent solutions and air pumped into the flotation cells cause the minerals to separate from the waste rock and bubble to the surface where they are collected and dried.

If the bulk concentrated copper contains molybdenum, it is first processed in a molybdenum plant as described below under "Molybdenum Production."

COPPER SMELTING

Copper concentrates are transported to a smelter, where they are smelted using a furnace, converter and anode furnace to produce either blister copper (which is in the form of cakes with air pockets) or copper anodes (which are cleaned of air pockets). At the smelter, the concentrates are mixed with flux (a chemical substance intentionally included for high temperature processing) and then sent to reverberatory furnaces producing copper matte and slag (a mixture of iron and other impurities). Copper matte contains approximately 65% copper. Copper matte is then sent to the converters, where the material is oxidized in two steps: (i) the iron sulfides in the matte are oxidized with silica, producing slag that is returned to the reverberatory furnaces, and (ii) the copper contained in the matte sulfides is then oxidized to produce copper that, after casting, is called blister copper, containing approximately 98% to 99% copper, or anodes, containing approximately 99.7% copper. Most of the blister and anode production is sent to the refinery and the remainder is sold to customers.

COPPER REFINING

Anodes are suspended in tanks with a solution containing water, sulfuric acid and copper sulfate. A weak electrical current is passed through the anodes and chemical solution and the dissolved copper is deposited on very thin starting sheets to produce copper cathodes containing approximately 99.99% copper. During this process, silver, gold and other metals (for example, palladium, platinum and selenium), along with other impurities, settle on the bottom of the tank (anodic muds). This anodic mud is processed at a precious metal plant where selenium, silver and gold are recovered.

COPPER ROD PLANT

To produce copper rod, copper cathodes are first smelted in a furnace and then dosified in a casting machine. The dosified copper is then extruded and passed through a cooling system that begins solidification of copper into a 60x50 millimeter copper bar. The resulting copper bar is gradually stretched in a rolling mill to achieve the desired diameter. The rolled bar is then cooled and sprayed with wax as a preservation agent and collected into a rod coil that is compacted and sent to market.

SOLVENT EXTRACTION/ELECTROWINNING ("SX-EW")

A complementary processing method is the leaching and SX-EW process. During the SX-EW process, low-grade sulfides ore and copper oxides are leached with sulfuric acid to allow copper content recovery. The acid and copper solution is then agitated with a solvent that contains chemical additives that attract copper ions. As the solvent is lighter than water, it floats to the surface carrying with it the copper content. The solvent is then separated using an acid solution, freeing the copper. The acid solution containing the copper is then moved to electrolytic extraction tanks to produce copper cathodes.

MOLYBDENUM PRODUCTION

Molybdenum is recovered from copper-molybdenum concentrates produced at the concentrator. The copper-molybdenum concentrate is first treated with a thickener until it becomes slurry with 60%

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solids. The slurry is then agitated in a chemical and water solution and pumped to the flotation separator. The separator creates a froth that carries molybdenum to the surface but not the copper mineral (which is later filtered to produce copper concentrates containing approximately 27% copper). The molybdenum froth is skimmed off, filtered and dried to produce molybdenum concentrates of approximately 58% contained molybdenum.

ZINC REFINING

Metallic zinc is produced through electrolysis using zinc concentrates and zinc oxides. Sulfur is eliminated from the concentrates by roasting and the zinc oxide is dissolved in sulfuric acid solution to eliminate solid impurities. The purified zinc sulfide solution is treated by electrolysis to produce refined zinc and to separate silver and gold, which are recovered as concentrates.

SULFURIC ACID PRODUCTION

Sulfur dioxide gases are produced in the copper smelting and zinc roasting processes. As a part of our environmental preservation program, we treat the sulfur dioxide emissions at two of our Mexican plants and at our Peruvian processing facilities to produce sulfuric acid, some of which is, in turn, used for the copper leaching process, with the balance sold to mining and fertilizer companies located principally in Mexico, Peru, United States and Chile.

SILVER AND GOLD REFINING

Silver and gold are recovered from copper, zinc and lead concentrates in the smelters and refineries, and from slimes through electrolytic refining.

KEY PRODUCTION CAPACITY DATA

All production facilities are owned by us. The following table sets forth as of December 31, 2018, the locations of production facilities by reportable segment, the processes used, as well as the key production and capacity data for each location:

Facility Name	Location	Process	Nominal Capacity(1)	2018 Production	2018 Capacity Use(4)
PERUVIAN OPEN-PIT UNIT Mining Operations					
Cuajone open-pit mine	Cuajone (Peru)	Copper ore milling and recovery, copper and molybdenum concentrate production	90.0 ktpd ore milled	82.2	91.3%
Toquepala open-pit mine; Concentrator I	Toquepala (Peru)	Copper ore milling and recovery, copper and molybdenum concentrate production	60.0 ktpd ore milled	59.9	99.9%
Concentrator II	Toquepala (Peru)	Leaching, solvent extraction and cathode electrowinning	60.0 ktpd ore milled	30.5	50.9%
Toquepala SX-EW plant			56.0 ktpy refined	26.5	47.4%
Processing Operations					
Ilo copper smelter	Ilo (Peru)	Copper smelting, blister, anodes production	1,200.0 ktpy concentrate feed	1,187.7	99.0%
Ilo copper refinery	Ilo (Peru)	Copper refining	280 ktpy refined cathodes	292.7	104.5%
Ilo acid plants	Ilo (Peru)	Sulfuric acid	1,050 ktpy sulfuric acid	1,169.1	111.3%
Ilo precious metals refinery	Ilo (Peru)	Slime recovery & processing, gold & silver refining	320 tpy	462.7	144.6%

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Facility Name	Location	Process	Nominal Capacity(1)	2018 Production	2018 Capacity Use(4)
MEXICAN OPEN-PIT UNIT					
Mining Operations					
Buenavista open-pit mine; Concentrator I	Sonora (Mexico)	Copper ore milling & recovery, copper concentrate production	82.0 ktpd milling	83.0	101.2%
Concentrator II			100.0 ktpd milling	109.7	109.7%
Buenavista: SX-EW plant I	Sonora (Mexico)	Leaching, solvent extraction & refined cathode electrowinning	11.0 ktpy refined		%
SX-EW plant II			43.8 ktpy refined	6.7	15.4%
SX-EW plant III			120.0 ktpy refined	82.1	68.4%
La Caridad open-pit mine	Sonora (Mexico)	Copper ore milling & recovery, copper & molybdenum concentrate production	94.5 ktpd milling	94.7	100.2%
La Caridad SX-EW plant	Sonora (Mexico)	Leaching, solvent extraction & cathode electrowinning	21.9 ktpy refined	26.4	120.6%
Processing Operations					
La Caridad copper smelter	Sonora (Mexico)	Concentrate smelting, anode production	1,000 ktpy concentrate feed	1,042	104.2%
La Caridad copper refinery	Sonora (Mexico)	Copper refining	300 ktpy copper cathode	239	79.7%
La Caridad copper rod plant	Sonora (Mexico)	Copper rod production	150 ktpy copper rod	147	98.1%
La Caridad precious metals refinery	Sonora (Mexico)	Slime recovery & processing, gold & silver refining	1.8 ktpy slime	1.1	61.8%
La Caridad sulfuric acid plant	Sonora (Mexico)	Sulfuric acid	1,565.5 ktpy sulfuric acid	1,002.5	64.0%
IMMSA UNIT					
Underground mines					
Charcas	San Luis Potosi (Mexico)	Copper, zinc, lead milling, recovery & concentrate production	1,460 ktpy ore milled	1,290	88.4%
San Martin(2)	Zacatecas (Mexico)	Lead, zinc, copper & silver mining, milling recovery & concentrate production	1,606 ktpy ore milled		%
Santa Barbara	Chihuahua (Mexico)	Lead, copper and zinc mining & concentrates production	2,190 ktpy ore milled	1,671	76.3%
Santa Eulalia	Chihuahua (Mexico)	Lead & zinc mining and milling recovery & concentrate production	547.5 ktpy ore milled	316	57.8%
Taxco(2)	Guerrero (Mexico)	Lead, zinc silver & gold mining recovery & concentrate production	730 ktpy ore milled		%
Nueva Rosita coal & coke complex(3)	Coahuila (Mexico)	Clean coal production	900 ktpy clean coal	42.8	4.8%
			100 ktpy coke		%
Processing Operations					
San Luis Potosi zinc refinery	San Luis Potosi (Mexico)	Zinc concentrates refining	105.0 ktpy zinc cathode	107.5	102.4%
San Luis Potosi sulfuric acid plant	San Luis Potosi (Mexico)	Sulfuric acid	180.0 ktpy sulfuric acid	184.2	102.3%

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ktpd = thousands of tons per day

ktpy = thousands of tons per year

Tpy = tons per year

- (1) Our estimates of actual capacity under normal operating conditions with allowance for normal downtime for repairs and maintenance and based on the average metal content for the relevant period.
- (2) The Taxco mine has been on strike since July 2007. The Company expects to have production from the San Martin mine in the second quarter of 2019.
- (3) At December 31, 2018, the coal reserves for the Nueva Rosita coal plant were 94.8 million tons with average sulfur content of 1.38% and a BTU content of 10,022 per pound.
- (4) In some cases, real production exceeds the nominal capacity due to higher grades and recovery rates.

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PROPERTY BOOK VALUE

At December 31, 2018, net book values of property are as follows (in millions):

Peruvian operations:	
Cuajone	\$ 704.3
Toquepala	1,018.9
Tia Maria project	333.9
Ilo and other support facilities	599.7
Construction in progress	1,611.4
Total Peru	\$ 4,268.2
Mexican open-pit operations:	
Buenavista mine and concentrator plants	\$ 2,324.6
Buenavista SX-EW and Quebalix	1,105.9
La Caridad mine and concentrator plant	352.0
La Caridad support facilities	400.2
Construction in progress	280.2
Total Mexico Open Pit	\$ 4,462.9
Mexican IMMSA unit:	
San Luis Potosi	\$ 96.9
Zinc electrolytic refinery	79.2
Charcas	60.9
San Martin	20.4
Santa Barbara	64.5
Taxco	2.2
Santa Eulalia	37.3
Nueva Rosita	8.7
Construction in progress and other facilities	77.2
Total IMMSA Unit	\$ 448.3
Other property:	
El Pilar	\$ 86.7
Mexicana del Arco	39.0
Total	\$ 125.7
Mexican administrative offices	\$ 98.7
Total Mexico	\$ 5,135.6
Total Southern Copper Corporation	\$ 9,403.8

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SUMMARY OPERATING DATA

The following table sets out certain operating data underlying our financial and operating information for each of the periods indicated.

	Year Ended December 31,			Variance			
	2018	2017	2016	2018 - 2017		2017 - 2016	
				Volume	%	Volume	%
COPPER (thousand pounds):							
<i>Mined</i>							
Peru open-pit							
Toquepala	316,849	271,056	256,894	45,793	16.9%	14,162	5.5%
Cuajone	354,016	348,562	377,978	5,454	1.6%	(29,416)	(7.8)%
SX-EW Toquepala	58,480	55,320	54,851	3,160	5.7%	469	0.9%
Mexico open-pit							
La Caridad	233,882	234,287	231,373	(405)	(0.2)%	2,914	1.3%
Buenavista	716,239	703,074	696,681	13,165	1.9%	6,393	0.9%
SX-EW La Caridad	58,232	62,586	62,406	(4,354)	(7.0)%	180	0.3%
SX-EW Buenavista	196,788	246,426	289,705	(49,638)	(20.1)%	(43,279)	(14.9)%
IMMSA unit	13,715	12,093	14,171	1,622	13.4%	(2,078)	(14.7)%
Total Mined	1,948,201	1,933,404	1,984,059	14,797	0.8%	(50,655)	(2.6)%
<i>Smelted</i>							
Peru open-pit							
Blister Ilo	5,799	3,953	2,048	1,846	46.7%	1,905	93.0%
Anodes Ilo	760,060	762,460	711,137	(2,400)	(0.3)%	51,323	7.2%
Mexico open-pit							
Anodes La Caridad	631,056	595,717	590,492	35,339	5.9%	5,225	0.9%
Total Smelted	1,396,915	1,362,130	1,303,677	34,785	2.6%	58,453	4.5%
<i>Refined</i>							
Peru Open-pit							
Cathodes Ilo	645,191	642,367	595,652	2,824	0.4%	46,715	7.8%
SX-EW Toquepala	58,480	55,320	54,851	3,160	5.7%	469	0.9%
Mexico Open-pit							
Cathodes La Caridad	527,306	502,783	494,175	24,523	4.9%	8,608	1.7%
SX-EW La Caridad	58,232	62,586	62,406	(4,354)	(7.0)%	180	0.3%
SX-EW Buenavista	196,788	246,426	289,705	(49,638)	(20.1)%	(43,279)	(14.9)%
Total Refined	1,485,997	1,509,482	1,496,789	(23,485)	(1.6)%	12,693	0.8%
Rod Mexico Open-pit La Caridad	324,403	293,435	318,604	30,968	10.6%	(25,169)	(7.9)%
SILVER (thousand ounces)							
<i>Mined</i>							
Peru Open-pit							
Toquepala	2,132	1,779	1,586	353	19.8%	193	12.2%
Cuajone	2,280	2,390	2,178	(110)	(4.6)%	212	9.7%
Mexico Open-pit							
La Caridad	2,085	2,009	1,967	76	3.8%	42	2.1%
Buenavista	5,162	4,988	4,819	174	3.5%	169	3.5%
IMMSA unit	5,649	4,760	5,622	889	18.7%	(862)	(15.3)%
Total Mined	17,308	15,926	16,172	1,382	8.7%	(246)	(1.5)%
<i>Refined</i>							

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Peru Ilo	3,884	3,953	3,295	(69)	(1.7)%	658	20.0%
Mexico La Caridad	8,496	7,152	8,260	1,344	18.8%	(1,108)	(13.4)%
IMMSA unit	1,203	2,583	3,641	(1,380)	(53.4)%	(1,058)	(29.0)%
Total Refined	13,583	13,688	15,196	(105)	(0.8)%	(1,508)	(9.9)%

MOLYBDENUM (thousand pounds)

Mined							
Toquepala	9,169	9,224	13,942	(55)	(0.6)%	(4,718)	(33.8)%
Cuajone	6,832	8,259	8,655	(1,427)	(17.3)%	(396)	(4.6)%
Buenavista	10,842	7,636	3,472	3,206	42.0%	4,164	119.9%
La Caridad	21,626	21,900	21,850	(274)	(1.2)%	50	0.2%
Total Mined	48,469	47,019	47,919	1,450	3.1%	(900)	(1.9)%

ZINC (thousand pounds)

Mined IMMSA	156,038	151,380	163,107	4,658	3.1%	(11,727)	(7.2)%
Refined IMMSA	237,076	230,166	233,894	6,910	3.0%	(3,728)	(1.6)%

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SLOPE STABILITY:

Peruvian Operations

The Toquepala and Cuajone pits are approximately 825 meters and 930 meters deep, respectively. Under the present mine plan configuration the Toquepala pit will reach a depth of 1,605 meters and the Cuajone pit will reach a depth of 1,380 meters. The deepening pits present us with a number of geotechnical challenges. Perhaps the foremost concern is the possibility of slope failure, a possibility that all open-pit mines face. In the past, in order to maintain slope stability, we have decreased pit slope angles, installed additional or duplicate haul road access, and increased stripping requirements. We have also responded to hydrological conditions and removed material displaced by slope failures. To meet the geotechnical challenges relating to slope stability of the open-pit mines, we have taken the following steps:

In the late 1990s, we hosted round table meetings in Vancouver, B.C. with a group of recognized slope stability and open-pit mining specialists. The agenda for these meetings was principally a review of pit design for mines with greater than 700 meter depth. The discussions included practices for monitoring, data collection and blasting processes.

Based on the concepts defined at the Vancouver meetings, we initiated slope stability studies to define the mining of reserves by optimum design. These studies were performed by outside consultants and included slope stability appraisals, evaluation of the numerical modeling, slope performance and inter-ramp angle design and evaluation of hydrological conditions.

The studies were completed in 2000 and we believe we implemented the study recommendations. One of the major changes implemented was slope angle reduction at both mines, at Toquepala by an average of five degrees and at Cuajone by an average of seven degrees. Although this increased the waste included in the mineable reserve calculation, it also improved the stability of the pits.

Since 1998, a wall depressurization program has been in place in both pits. This consists of a horizontal drilling program, which improves drainage thereby reducing saturation and increasing wall stability. Additionally, a new blasting control program was put in place, implementing vibration monitoring and blasting designs of low punctual energy and pre-split techniques. Also a new slope monitoring system was implemented using reflection prisms, deformation inclinometers and piezometers for water level control, as well as real-time robotic monitoring equipment.

Toquepala:

In 2007, we installed 20 meter wide geotechnical berms every 10 benches at the Toquepala mine. We believe this will further strengthen the stability of the Toquepala pit. In October 2012, two interferometric radars were put in place to monitor slope stability at the Toquepala mine, and in September 2013, new full monitoring software (FMS360) was installed. These systems improve the reliability of instrumentation, the information quality for assessing the behavior of the slopes and anticipates the risks of instability.

In 2013, a mining consulting group began a study of dump stability at the Toquepala mine. This study assessed the current stability of the dumps and is developing a geotechnical campaign to obtain information to assess the stability of the future and final stages of the dumps. In 2016, the stability study was resumed by executing geophysical test and test pits for the characterization of the dumps. The execution of sonic perforations and complementary geophysical tests are currently pending. On December 2016, the consultants also presented the report "*Slope Stability Analysis in Deposits of Waste and Leachable Material*".

In 2016, the mining consultants presented the final report "*Physical Stability of the Quebrada Honda tailings dam*". This study consisted in the development of geotechnical investigations, static,

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seismic and post-seismic stability analysis, filtration analysis, deformation analysis, liquefaction potential analysis and dynamic analysis.

In 2016, as part of the slope stability upgrade study, a geotechnical and hydrological oriented drill program of 3,470 meters was executed at the Toquepala mine. This program was conducted in order to complement the study and to get a better understanding of the behavior of the rock mass. The geotechnical drilling program involved 11 diamond drill holes, six geotechnical drills and five hydrogeological drills, all of them with geological and geotechnical logging. During the execution of these hydrogeological drills, permeability tests in the rock were executed as well as slug tests and constant load tests. Additionally, instrumentation was implemented with five vibrating wire piezometers for the monitoring of water table and to give support to the hydrogeological model. Also in 2016, the external mining consultants began the report for phase three of this study, which was concluded in 2017. They submitted and updated the block models of inter-ramp angles, the model of rock mass, the hydrogeological model and the 3D structural model. In addition, fieldwork continued on the *"Slope Stability Analysis in Deposits of Waste and Leachable Material"* study by executing geophysical tests, sampling and laboratory tests of soil mechanics. This study was concluded and submitted by the external consultants in 2018. Additionally, in 2018 we dedicated efforts to update the geotechnical pit models, which are essential to perform the analysis of slope stability. Related to this, we have carried out actions, including the completion of the geotechnical database implementation, laboratory testing, training, and other important aspects.

In recent years, we have destined efforts for the development of stability studies of slopes of the pit, dumps and leachable deposits and tailings; thus guaranteeing the safety of personnel and equipment, the continuity of the operation, and complying with Peruvian regulations.

Cuajone:

At the Cuajone mine, in 2007 in order to minimize the damage to the slopes caused by production blast vibrations, blasting control using three pre-split drills was implemented. Also, the slope monitoring system with reflection prisms has been replaced by a system using slope monitoring radar. In February 2012, the first radar equipment was put in service followed in August 2013 with the second radar installation and a geotechnical surveillance camera was added. This system improved the reliability and continuity of monitoring, improved the quality of information used to evaluate the performance of the slopes and helped better anticipate the risk of instability. The sub-surface deformation and the water level are still monitored with inclinometers and piezometers. In September 2012, we completed a program of oriented geotechnical drilling totaling 17,938 meters, and in May 2013 we completed a program of vertical geotechnical drilling totaling 2,814 meters, with hydraulic tests performed on rock and subsequently instrumented with inclinometers/piezometers. The geotechnical and hydraulic information obtained from the two programs will be used in the development of a geotechnical study for the new 15 year mine development plan (2015-2029). Also during 2013, we drilled 772 meters of sub-horizontal holes in order to drain the east slope of the pit. The geotechnical study for the new 15-year mine development plan was completed at the end of 2015 and the result of this study is the increase by an average of three degrees of the inter ramp angle and include 40 meters wide geotechnical berms for inter ramp heights above 150 meters. This study also contains recommendations for improving the stability of the pit slopes.

In 2013, the Board of Directors approved a project to improve slope stability at the south area of the Cuajone mine, which will remove approximately 148 million tons of waste material in order to improve the mine design without reducing our actual production level. As of December 31, 2018, 96.1 million tons of waste material have been removed. For further information see Item 7 "Management Discussion and Analysis Capital Investment Program."

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In 2017, we installed three vibration monitoring stations and ten digital extensometers to monitor surface deformations on waste dumps in real time. We also completed the detailed engineering for the construction of the coronation channel in the west Torata waste dump. In 2018, we began to operate the first radar for monitoring blasting vibrations and a second geotechnical surveillance camera. This equipment will allow us to improve control over the walls of the pit and to anticipate possible damages.

To increase the possibility of mining in the event of a slide, we have provided for two extraction ramps for each open-pit mine. While these measures cannot guarantee that a slope failure will not occur, we believe that our mining practices are sound and that the steps taken and the ongoing reviews performed are a prudent methodology for open-pit mining.

Mexican operations

In 2004, our 15-year mine plan study for the La Caridad mine was awarded to an independent consulting firm to conduct a geotechnical evaluation. The purpose of the plan was to develop a program of optimum bench design and inter-ramp slope angles for the open-pit. The results of the evaluation presented by the consultants included a recommendation of a maximum average bench face angle of 72 degrees. Additionally, single benching was recommended for the upper sections of the west, south and east walls of the main pit. Likewise, double benching was recommended for the lower levels of the main pit and single benching for the upper slope segments that consist of either alluvial material, mine waste dumps or mineralized stockpile material. Alternatively, slopes in these types of materials, may be designed with an overall 37 degree slope. The geosstructural and geotechnical parameters recommended were applied in the pit design for the new life of the mine plan for La Caridad mine prepared in 2015. This mine plan replaced the 15-year mine plan prepared in 2010. However, since final pit limits have not been yet established at La Caridad, all current pit walls are effectively working slopes. Geosstructural and geotechnical data collected at the open-pit mine from cell-mapping and oriented-core drilling databases provided the basis for the geotechnical evaluation and recommendations. We continue to collect new information related to geotechnical data and other geology features from the mine pit and diamond drill hole, in order to ensure the structural security and also to improve the geotechnical data base for future studies.

At the Buenavista mine, we are following the recommendations of a geotechnical evaluation of design slope for the 15-year pit plan. This evaluation was prepared by an independent mine consulting firm. This evaluation included the determination of optimum pit slope design angles and bench design parameters for the proposed mine plan. The objective of the study was: (1) to determine optimum inter-ramp slope angles and bench design parameters for the 15-year plan and (2) to identify and analyze any potential major instability that could adversely impact mine operation. In 2012, we installed a radar system to monitor the walls of the mine.

The following recommendations were made for the Buenavista mine: inter-ramp slope design angles for the 15-year pit plan, for all of the 21 design sectors, defined on a rock-fabric-based catch bench analysis, using double bench, can range from 48° and 55°, and the inter-ramp slope angles are based on geometries that resulted from the back-break analysis using 80% reliability of achieving the required 7.5 meter catch bench width for a single bench configuration and 10.6 meter catch bench width for a double bench configuration. Preliminary observations suggest the 15-year pit walls may be relative free-draining, the back-break analysis assumed depressurized conditions of mine benches, and the inter-ramp stability analysis were performed for both, saturated and depressurized conditions.

A pit dewatering/depressurization plan for the Buenavista mine was also recommended to address the issues of open-pit drainage, dewatering plan and future slope depressurization. Phase I of the geohydrological study was completed by an independent consultant. The analysis included a preliminary assessment and work plan implementations.

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In 2011, five wells for extraction and monitoring were drilled close to the mine. Also, we began a drilling program to monitor possible water filtration beyond the limits of the open-pit mine. All the information obtained from these well drilling programs has been analyzed and included in the hydrologic model. The open-pit dewatering program from the bottom benches also continued during 2012 with a drilling program of 3,797 meters in several monitoring wells in order to allow us to continue with the current mining plan.

In 2013, Buenavista continued the drilling program monitoring the extraction wells in the area of Increment (Phase) five of the mine and beyond the current limits of the open pit mine.

During 2013, the program to dewater the Buenavista pit bottom was continued in accordance with the short and medium term mine plans. Pumping from sumps located in Increment five, permitted mining of high grade copper blocks. Concurrent with this operational task, a geophysical study was conducted to determine the best locations for water extraction wells to control the inflow of water to the pit bottom and thus allow us to continue our mining operations. The water extracted is being used for various purposes, including road irrigation for dust mitigation. The geophysical investigation also permitted the location of underground workings and the filtration and seepage through fractures.

A total of 7,339 meters were drilled during 2013 for 30 extraction wells, three of these wells are located in the area of Increment (Phase) five. The rest were drilled at various locations outside of the current open pit mine limit.

In 2014, we continued collecting new geotechnical information from two exploration drilling projects; this data is available to analyze the geotechnical data base for new studies in accordance with slope angle for the open pit excavations. In the free face benches at the open pit mine operations, the cell-mapping were prepared to increment the geotechnical data base. Following the recommendations of geotechnical evaluation we continued monitoring the walls using the radar system.

Various studies are now being conducted by outside specialized consultants in order to establish long-range mine water management objectives and to implement recommendations for the efficient use of this resource.

Tailings Dams

Tailings are comprised of solid particles originating at the concentrator plants during the grinding process that, combined with water, are sent to specially built structures where they are impounded. The water is recovered to be reused in the process.

Tailings dams are basically built in two manners: by using the coarse fraction from the same tailings or by using external material, often known as "borrowed material" such as rock, clay etc. We believe SCC's tailings dams are built with the highest quality standards and engineering practices. We comply with and at times exceed the national norms and recommendations of the International Commission on Large Dams (ICOLD). In addition we maintain a committee including both internal and external specialists, which periodically review the safety and operation of each dam.

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We have six tailings dams in operation in Mexico and one in Peru as follows:

Country	Operation	Name	Current Height	Material	Method
Mexico	Buenvista	Tailings dam # 3	90 meters	Borrowed	Downstream
Mexico	Buenvista	New tailings dam	70 meters	Borrowed	Downstream
Mexico	La Caridad	Tailings dam # 7	168 meters	Borrowed	Downstream
Mexico	Charcas	Tailings dam	50 meters	Coarse tailings	Upstream
Mexico	Santa Barbara	Noriega dam	45 meters	Coarse tailings	Upstream
Mexico	Santa Eulalia	Tailings dam	70 meters	Coarse tailings	Upstream
Peru	Cuajone and Toquepala	Quebrada Honda	128 meters	Coarse tailings	Downstream

METAL PRODUCTION BY SEGMENTS

Set forth below are descriptions of the operations and other information relating to the operations included in each of our three segments.

PERUVIAN OPERATIONS

Our Peruvian segment operations include the Cuajone and Toquepala mine complexes and the smelting and refining plants, industrial railroad which links Ilo, Toquepala and Cuajone and the port facilities.

Following is a map indicating the approximate location of, and access to, our Cuajone and Toquepala mine complexes, as well as our Ilo processing facilities:

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We have ongoing maintenance and improvement programs to ensure the satisfactory performance of our equipment. We believe all our Peruvian plant's equipment is in good physical condition and suitable for our operations.

Cuajone

Our Cuajone operations consist of an open-pit copper mine and a concentrator located in southern Peru, 30 kilometers from the city of Moquegua and 840 kilometers from Lima, at an altitude of 3,430 meters above sea level. Access to the Cuajone property is by plane from Lima to Tacna (1:40 hours) and then by highway to Moquegua and Cuajone (3:30 hours). The concentrator has a milling capacity of 90,000 tons per day. Overburden removal commenced in 1970 and ore production commenced in 1976. Our Cuajone operations utilize a conventional open-pit mining method to collect copper ore for further processing at the concentrator.

The table below sets forth 2018, 2017 and 2016 production information for our Cuajone operations:

		2018	2017	2016	Variance 2018 - 2017	
					Volume	%
Mine annual operating days		365	365	366		
<i>Mine</i>						
Total ore mined	(kt)	29,571	29,769	30,825	(198)	(0.7)%
Copper grade	(%)	0.651	0.617	0.649	0.034	5.5%
Leach material mined	(kt)	1,122			1,122	100%
Leach material grade	(%)	0.456			0.456	100%
Stripping ratio	(x)	4.92	4.01	4.68	0.91	22.7%
Total material mined	(kt)	175,177	149,265	175,009	25,912	17.4%
<i>Concentrator</i>						
Total material milled	(kt)	29,575	29,751	30,681	(176)	(0.6)%
Copper recovery	(%)	83.40	86.10	86.12	(2.70)	(3.1)%
Copper concentrate	(kt)	660.7	607.5	656.5	53.2	8.8%
Copper in concentrate	(kt)	160.6	158.1	171.4	2.5	1.6%
Copper concentrates average grade	(%)	24.31	26.03	26.11	(1.72)	(6.6)%
<i>Molybdenum</i>						
Molybdenum grade	(%)	0.019	0.019	0.019		
Molybdenum recovery	(%)	55.63	66.62	68.60	(10.99)	(16.5)%
Molybdenum concentrate	(kt)	5.8	6.9	7.1	(1.1)	(16.0)%
Molybdenum concentrate average grade	(%)	53.30	54.16	55.01	(0.86)	(1.6)%
Molybdenum in concentrate	(kt)	3.1	3.7	3.9	(0.6)	(17.3)%

Key: kt = thousand tons

x = Stripping ratio obtained dividing waste plus leachable material by ore mined.

Copper and molybdenum grades are referred to as total copper grade and total molybdenum grade, respectively.

Geology

The Cuajone porphyry copper deposit is located on the western flank of Cordillera Occidental, in the southern-most region of the Andes mountains range of Peru. The deposit is part of a mineral district that contains two additional known deposits, Toquepala and Quellaveco. The copper mineralization at Cuajone is typical of porphyry copper deposits.

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The Cuajone deposit is located approximately 30 kilometers north-west from the Toquepala deposit and is part of the Toquepala Group dated approximately 60 to 100 million years (Upper Cretaceous to Lower Tertiary). The Cuajone lithology contains volcanic rocks from the Cretaceous to the Quaternary period. The deposit contains 50 rock types including, pre-mineral rocks, basaltic andesite, porphyritic rhyolite, Toquepala dolerite, Toquepala rhyolite and intrusive rocks, including diorite, porphyritic latite, breccias and dikes. In addition, the following post-mineral rocks are present: the Huaylillas and Chuntacala formations that have been formed by conglomerates, tuffs sequence, traquites and agglomerates. These formations date from nine to 23 million years. There is also the occurrence of Quaternary rocks formed by alluvial and colluvial mainly located in slopes of hills and streams.

The mineralogy is simple and is evenly distributed. It is mainly composed of minerals such as chalcopyrite (CuFeS₂), chalcocine (Cu₂S) and molybdenite (MoS₂) with occasional presence of galena, enargite and tetraedrite without economic value.

Mine exploration

Exploration activities during the drill campaign in 2018 were as follows:

Studies	Meters	Holes	Notes
Infill drilling	15,077	33	To obtain additional information to improve confidence in our block model.
Reverse circulation	3,850	72	To corroborate presence of oxides in Dump N°3
Geotechnical	4,404	21	To confirm the continuity of major structures.

Concentrator

Our Cuajone operations use state-of-the-art computer monitoring systems at the concentrator, the crushing plant and the flotation circuit in order to coordinate inflows and optimize operations. Material with a copper grade over 0.35% is loaded onto an overland conveyor belt and sent to the milling circuit, where giant rotating crushers reduce the size of the rocks to approximately one-half of an inch. The ore is then sent to the ball mills, which grind it to the consistency of fine powder. The finely ground powder is agitated in a water and reagents solution and is then transported to flotation cells. Air is pumped into the cells to produce foam for floating the copper and molybdenum minerals, but separating waste material called tailings. This copper-molybdenum bulk concentrate is then treated by inverse flotation where molybdenum is floated and copper is depressed. The copper concentrate is shipped by rail to the smelter at Ilo and the molybdenum concentrate is packaged for shipment to customers. Sulfides under 0.35% copper are considered waste.

Tailings are sent to thickeners where water is recovered. The remaining tailings are sent to the Quebrada Honda dam, our principal tailings storage facility.

A major mill expansion was completed in 1999 and the eleventh primary mill was put in operation in January 2008. In December 2013, the high pressure grinding roll was put in operation. At the end of 2016, the Larox filter press for molybdenum concentrate began operations. The overland primary crusher began operations in May 2018. The new tailings thickener is expected to start operations in early 2019.

Toquepala

Our Toquepala operations consist of an open-pit copper mine and two concentrators. We also refine copper at the SX-EW facility through a leaching process. Toquepala is located in southern Peru, 30 kilometers from Cuajone and 870 kilometers from Lima, at an altitude of 3,220 meters above sea level. Access is by plane from Lima to the city of Tacna (1:40 hours) and then by the Pan-American highway to Camiara (1:20 hours) and by road to Toquepala (1 hour). Each concentrator has a milling

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capacity of 60,000 tons per day. The SX-EW facility has a production capacity of 56,000 tons per year of LME grade A copper cathodes. Overburden removal commenced in 1957 and ore production commenced in 1960. Our Toquepala operations utilize a conventional open-pit mining method to collect copper ore for further processing in our concentrators. The second concentrator began operations in the fourth quarter of 2018.

The table below sets forth 2018, 2017 and 2016 production information for our Toquepala operations:

		2018	2017	2016	Variance 2018 - 2017	
					Volume	%
Mine annual operating days		365	365	366		
<i>Mine</i>						
Total ore mined	(kt)	22,701	20,411	19,940	2,290	11.2%
Copper grade	(%)	0.686	0.663	0.647	0.023	3.5%
Leach material mined	(kt)	104,126	85,048	78,485	19,078	22.4%
Leach material grade	(%)	0.160	0.201	0.191	(0.041)	(20.4)%
Stripping ratio	(x)	9.64	8.98	9.48	0.66	7.4%
Total material mined	(kt)	241,514	203,778	209,064	37,736	18.5%
<i>Concentrator</i>						
Total material milled	(kt)	23,060	20,392	20,071	2,668	13.1%
Copper recovery	(%)	90.99	90.94	89.73	0.05	0.1%
Copper concentrate	(kt)	528.2	451.9	424.5	76.3	16.9%
Copper in concentrate	(kt)	143.7	122.9	116.5	20.8	16.9%
Copper concentrate average grade	(%)	27.21	27.21	27.45		
<i>SX-EW plant</i>						
Estimated leach recovery	(%)	24.11	24.62	25.29	(0.51)	(2.1)%
SX-EW cathode production	(kt)	26.5	25.1	24.8	1.4	5.7%
<i>Molybdenum</i>						
Molybdenum grade	(%)	0.028	0.029	0.043	(0.001)	(3.5)%
Molybdenum recovery	(%)	68.42	69.69	73.61	(1.27)	(1.8)%
Molybdenum concentrate	(kt)	7.5	7.5	11.3		
Molybdenum concentrate average grade	(%)	55.54	55.76	55.96	(0.22)	(0.4)%
Molybdenum in concentrate	(kt)	4.2	4.2	6.3		

Key: kt = thousand tons

x = Stripping ratio obtained dividing waste plus leachable material by ore mined.

Copper and molybdenum grades are referred to as total copper grade and total molybdenum grade, respectively.

Geology

The Toquepala porphyry deposit is located on the western slopes of Cordillera Occidental, in the southern-most region of the Andes mountains range of Peru, approximately 120 kilometers from the border with Chile. This region extends into Chile and is home to many of the world's most significant known copper deposits. The deposit is part of a mineral district that contains two additional known deposits, Cuajone and Quellaveco. The deposit is in a territory with intrusive and eruptive activities of rhyolitic and andesitic rocks which are 70 million years old (Cretaceous-Tertiary) and which created a series of volcanic lava. The lava is composed of rhyolites, andesites and volcanic agglomerates with a western dip and at an altitude of 1,500 meters. These series are known as the Toquepala Group.

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Subsequently, different intrusive activities occurred which broke and smelted the rocks of the Toquepala Group. These intrusive activities resulted in diorites, granodiorites and dikes of porphyritic dacite. Toquepala has a simple mineralogy with regular copper grade distribution. Economic ore is found as disseminated sulfurs throughout the deposit as veinlets, replenishing empty places or as small aggregates. Ore minerals include chalcopyrite (CuFeS₂), chalcosine (Cu₂S) and molybdenite (MoS₂). A secondary enrichment zone is also found with thicknesses between 0 and 150 meters.

Mine Exploration

Exploration activities during the drill campaign in 2018 were as follows:

Studies	Meters	Holes	Notes
Ore and leach confirmation to reserves and phases	14,758	23	To confirm the continuity of the ore and leach material.
Study of Slopes Stability Instability-West Sector	400	2	To define the potential depth of instability.
Exploration geotechnical and hydrogeological drill	6,081	16	To define rock mass quality and hydrogeological behavior.
Total	21,239	41	

Concentrator

Our Toquepala concentrator operations use state-of-the-art computer monitoring systems in order to coordinate inflows and optimize operations. Material with a copper grade over 0.40% is loaded onto rail cars and sent to the crushing circuit, where rotating crushers reduce the size of the rocks by approximately 85%, to less than one-half of an inch. The ore is then sent to the rod and ball mills, which grind it in a mix with water to the consistency of fine powder. The finely ground powder mixed with water is then transported to flotation cells. Air is pumped into the cells producing a froth, which carries the copper mineral to the surface but not the waste rock, or tailings. The bulk concentrate with sufficient molybdenum content is processed to recover molybdenum by inverse flotation. This final copper concentrate with a content of approximately 26.5% of copper is filtered in order to reduce moisture to 8.5% or less. Concentrates are then shipped by rail to the Ilo smelter.

Tailings are sent to thickeners where water is recovered. The remaining tailings are sent to the Quebrada Honda dam, our principal tailings storage facility.

SX-EW Plant

The SX-EW facility at Toquepala produces grade A LME electrowon copper cathodes of 99.999% purity from solutions obtained by leaching low-grade ore stored at the Toquepala and Cuajone mines. The leach plant commenced operations in 1995 with a design capacity of 35,629 tons per year of copper cathodes. In 1999, the capacity was expanded to 56,000 tons per year.

Copper oxides from Cuajone with a copper grade higher than 0.275%, with an acid solubility index higher than 48% and a cyanide solubility index higher than 24% are leached. In Toquepala, the copper sulfides cutoff grade is 0.041% and therefore material with a total copper grade between 0.041% and 0.223% are leached. Copper in solution produced at Cuajone is sent to Toquepala through an eight-inch pipe laid alongside the Cuajone-Toquepala railroad track.

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Plant and equipment are supported by a maintenance plan and a quality management system to assure good physical condition and high availability. The SX-EW plant management quality system (including leaching operations) has been audited periodically since 2002 by an external audit company, and found to be in compliance with the requirements of the ISO 9001-2008 standard. In 2012, we obtained the certification OHSAS 18001-2007 of our occupational health and safety system and the ISO14001-2015 for our environmental standards at the SX-EW plant.

Processing Facilities Ilo

Our Ilo smelter and refinery complex is located in the southern part of Peru, 17 kilometers north of the city of Ilo, 121 kilometers from Toquepala, 147 kilometers from Cuajone and 1,240 kilometers from the city of Lima. Access is by plane from Lima to Tacna (1:40 hours) and then by highway to the city of Ilo (2:00 hours). Additionally, we maintain a port facility in Ilo, from which we ship our products and receive supplies. Products shipped and supplies received are moved between Toquepala, Cuajone and Ilo on our industrial railroad.

Smelter

Our Ilo smelter produces copper anodes for the refinery we operate as part of the same facility. When the copper produced by the smelter exceeds the refinery's capacity, the excess is sold to other refineries around the world. In 2007, we completed a major modernization of the smelter. The nominal installed capacity of the smelter is 1,200,000 tons of copper concentrate per year. Copper concentrates from Toquepala and Cuajone are transported by railroad to the smelter, where they are smelted using an ISASMELT furnace, converters and anode furnaces to produce copper anodes with 99.7% copper. At the smelter, the concentrates are mixed with flux and other material and sent to the ISASMELT furnace producing a mixture of copper matte and slag, which is tapped through a taphole to either of two rotary holding furnaces, where these smelted phases will be separated. Copper matte contains approximately 63% copper. Copper matte is then sent to the four Pierce Smith converters, where the material is oxidized in two steps: (1) the iron sulfides in the matte are oxidized with oxygen enriched air and silica is added producing slag that is sent to the slag cleaning furnaces, and (2) the copper contained in the matte sulfides is then oxidized to produce blister copper, containing approximately 99.3% copper. The blister copper is refined in two anode furnaces by oxidation to remove sulfur with compressed air injected into the bath. Finally, the oxygen content of the molten copper is adjusted by reduction with injection of liquefied petroleum gas with steam into the bath. Anodes, containing approximately 99.7% copper, are cast in two casting wheels. The smelter also can produce blister copper bars, especially when an anode furnace is in general repair.

The table below sets forth 2018, 2017 and 2016 production and sales information for our Ilo smelter plant:

Smelter		2018	2017	2016	Variance 2018 - 2017	
					Volume	%
Concentrate smelted	(kt)	1,187.7	1,153.5	1,070.6	34.2	3.0%
Average copper recovery	(%)	97.4	97.4	97.4		
Anode production	(kt)	345.6	346.6	323.3	(1.0)	(0.3)%
Average anode grade	(%)	99.77	99.77	99.77		
Blister production	kt	2.7	1.8	0.9	0.9	46.8%
Average blister grade	(%)	99.24	99.32	99.23	(0.08)	(0.09)%
Sulfuric acid produced	(kt)	1,169.1	1,119.6	1,036.3	49.5	4.4%

Key: kt = thousand tons

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The off gases from the smelter are treated to recover over 92% of the incoming sulfur received in the concentrates producing 98.5% sulfuric acid. The gas stream from the smelter with 11.34% SO₂ is split between two plants: The No. 1 acid plant (single absorption/single contact) and the No. 2 plant (double absorption/double contact). Approximately, 16% of the acid produced is used at our facilities with the balance sold to third parties. We anticipate that our internal usage will be over 80% when the Tia Maria project begins operation. The smelter also has two oxygen plants. Plant No. 1, with 272 tons per day of production capacity, and Plant No.2, with 1,045 tons per day of capacity.

In 2010, the Ilo smelter marine trestle started operation. This facility allows us to offload directly to offshore ships the sulfuric acid produced, avoiding hauling cargo through the city of Ilo. The 500 meter long marine trestle is the last part of the Ilo smelter modernization project. Currently all overseas shipments of sulfuric acid are being made using the marine trestle.

Refinery

The Ilo refinery consists of an electrolytic plant, a precious metal plant and a number of ancillary installations. The refinery is producing grade A copper cathode of 99.998% purity. The nominal capacity is 280,000 tons per year. Anodic slimes are recovered from the refining process and then sent to the precious metals facility to produce refined silver, refined gold and commercial grade selenium.

Anodes are suspended in tanks containing a solution of sulfuric acid and copper sulfate. A low voltage but high amperage electrical current is passed through the anodes, chemical solution and cathodes in order to dissolve copper which is deposited on initially very thin starting sheets increasing its thickness to produce high grade copper cathodes. During this process, silver, gold and other metals, including palladium, platinum and selenium, along with other impurities, settle on the bottom of the tank in the form of anodic slime. This anodic slime is processed in a precious metal plant where silver, gold and selenium are recovered.

The table below sets forth 2018, 2017 and 2016 production and sales information for our Ilo refinery and precious metals plants:

Refinery		2018	2017	2016	Variance 2018 - 2017	
					Volume	%
Cathodes produced	(kt)	292.7	291.4	270.2	1.3	0.4%
Average copper grade	(%)	99.999	99.999	99.998		
Refined silver produced	(000 Kg)	120.8	123.0	102.5	(2.2)	(1.8)%
Refined gold produced	(kg)	282.4	237.7	209.9	44.7	18.8%
Commercial grade selenium produced	(tons)	52.2	49.2	48.7	3.0	5.9%

Key: kt = thousand tons

In addition to the processing facilities, the refinery has a production control section, a laboratory which provides sample analysis throughout the Company, a maintenance department, a desalinization plant and other support facilities.

Other facilities in Ilo are a coquina plant with a production capacity of 200,000 tons per year of seashells and a lime plant with a capacity of 80,000 tons per year. We also operate an industrial railroad to haul production and supplies between Toquepala, Cuajone and Ilo.

The industrial railroad's main equipment includes locomotives of different types and rolling stock with different types of cars and capacities. The track runs in a single 214 kilometer standard gauge line and supports a 30-ton axle load. The total length of the track system is around 257 kilometers including main yards and sidings. The infrastructure includes 27 kilometers of track under tunnels and one concrete bridge. The industrial railroad includes a car repair shop which is responsible for maintenance and repair of the car fleet. Annual tonnage transported is approximately 4.7 million tons.

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MEXICAN OPERATIONS

Following is a map indicating the approximate locations of our Mexican mines and processing facilities:

MEXICAN OPEN-PIT SEGMENT

Our Mexican open-pit segment operations combine two units of Minera Mexico, La Caridad and Buenavista, which include La Caridad and Buenavista mine complexes and smelting and refining plants and support facilities, which service both complexes.

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Following is a map indicating the approximate location of, and access to, our Mexican open-pit mine complexes, as well as our processing facilities:

We have ongoing maintenance and improvement programs to ensure the satisfactory performance of our equipment. We believe all our Mexican open-pit segment equipment is in good physical condition and suitable for our operations.

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Buenavista

The Buenavista mining unit operates an open-pit copper mine, two concentrators and three SX-EW plants. It is located 100 air-kilometers northwest of La Caridad and 40 kilometers south of the Arizona, U.S. Mexican border, at an altitude of 1,900 meters above sea level. It lies on the outskirts of the city of Cananea. Buenavista is connected by paved highways to the border city of Agua Prieta to the northeast, to the town of Nacozari in the southeast and to the town of Imuris to the west. Buenavista is also connected by railway to Agua Prieta and Nogales. A municipal airport is located approximately 20 kilometers to the northeast of Buenavista.

We have concluded our \$3.5 billion investment program in Mexico and all of the projects of this program are in full operation. The program included a third SX-EW plant, completed in June 2014, with a rated annual capacity of 120,000 tons of copper. A new concentrator, completed in 2015, with an annual copper production capacity of 188,000 tons. The program includes two molybdenum plants with a combined annual capacity of 4,600 tons. The first plant was completed in 2013 and the second one, in 2016. Additionally, the program included the Crushing, Conveying and Spreading System for Leachable Ore (Quebalix IV), which has been completed on time and under budget and is currently operating steadily. This project will reduce mining costs as well as increase SX-EW copper recovery, allowing the Buenavista unit to reach its copper production capacity of 500,000 tons.

The original concentrator currently has a nominal milling capacity of 76,700 tons per day. The second concentrator began operations in 2015 with a nominal milling capacity of 100,000 tons per day. The SX-EW facilities have a cathode production capacity of 174,470 tons per year. The Buenavista ore body is considered one of the world's largest porphyry copper deposits. Buenavista is the oldest continuously operated copper mine in North America, with operations dating back to 1899. High grade ore deposits in the district were mined exclusively using underground methods. The Anaconda Company acquired the property in 1917. In the early 1940s, Anaconda started developing the first open-pit in Buenavista. In 1990, through a public auction procedure, Minera Mexico acquired 100% of the Buenavista mining assets for \$475 million. Buenavista is currently applying conventional open-pit mining methods to extract copper ore for further processing in the concentrator.

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The following table shows 2018, 2017 and 2016 production information for Buenavista:

		2018	2017	2016	2018 - 2017	
					Volume	Variance
Mine annual operating days		365	365	366		
<i>Mine:</i>						
Total ore mined	(kt)	70,464	69,773	66,328	691	1.0%
Copper grade	(%)	0.537	0.547	0.566	(0.010)	(1.8)%
Leach material mined	(kt)	145,253	157,802	123,738	(12,549)	(8.0)%
Leach material grade	(%)	0.242	0.261	0.281	(0.019)	(7.3)%
Stripping ratio	(x)	3.23	3.14	2.88	0.09	2.9%
Total material mined	(kt)	297,718	288,716	257,395	9,002	3.1%
<i>Concentrator:</i>						
Total material milled	(kt)	70,328	69,294	66,112	1,034	1.5%
Copper recovery	(%)	86.02	84.12	84.50	1.90	2.3%
Copper concentrate	(kt)	1,371.1	1,361.8	1,329.6	9.3	0.7%
Copper in concentrate	(kt)	325.0	319.0	316.0	6.0	1.9%
Copper concentrate average grade	(%)	23.7	23.42	23.77	0.3	1.3%
<i>SX-EW plant</i>						
Estimated leach recovery	(%)	60.00	70.00	70.77	(10.00)	(14.3)%
SX-EW cathode production	(kt)	89.3	111.8	131.4	(22.5)	(20.1)%
<i>Molybdenum</i>						
Molybdenum grade	(%)	0.012	0.013	0.013	(0.001)	(7.7)%
Molybdenum recovery	(%)	58.44	39.85	25.11	18.59	46.7%
Molybdenum concentrate	(kt)	9.62	6.74	3.19	2.88	42.4%
Molybdenum concentrate average grade	(%)	51.13	51.38	49.45	(0.25)	(0.5)%
Molybdenum in concentrate	(kt)	8.41	3.46	1.58	4.95	143.0%

Key: kt = thousand tons

x = Stripping ratio obtained dividing waste plus leachable material by ore mined.

The copper and molybdenum grade are total grade.

Geology

The Buenavista mining district lies on the southern cordilleran orogen, which extends from southern Mexico to northwestern United States. It also falls within the Basin and Range metallogenic province. Geological and structural features in the district are representative of large, disseminated type, porphyry copper deposits. A calcareous sedimentary sequence of lower Paleozoic age, lithologically correlated with a similar section in southeastern Arizona, unconformably overlies Precambrian granite basement. The entire section was covered by volcanic rocks of Mesozoic age and later intruded by deep seated granodiorite batholith of Tertiary age, with further quartz monzonite porphyry differentiates of Laramide age.

Mineralization in the district is extensive covering a surface area of approximately 30 square kilometers. An early pegmatitic stage associated with bornite-chalcocite-molybdenite assemblage was followed by a widespread flooding of hydrothermal solutions with quartz-pyrite-chalcocite. A pervasive quartz-sericite alteration is evident throughout the district's igneous rock fabric.

An extensive and economically important zone of supergene enrichment, with disseminated and stockworks of chalcocite (Cu₂S), developed below the iron oxide capping. This zone coincides with the topography and has an average thickness of 300 meters. A mixed zone of secondary and primary

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sulfides underlay the chalcocite blanket. The hypogene mineralization, principally chalcopyrite (CuFeS_2), extensively underlies the ore body. Molybdenite occurs throughout the deposit and the content tends to increase with depth.

The Buenavista copper porphyry is considered world-class and unique. The deepest exploration results in the core of the deposit have confirmed significant increase in copper grades. Similar porphyry copper deposits usually contain lower grades at depth. The district is also unique for the occurrence of high-grade breccia pipes, occurring in clusters following the trend of the district.

Current dimensions of the mineralized ore body are 5x3 kilometers, and projects to more than one kilometer at depth. Considering the geological and economic potential of the Buenavista porphyry copper deposit, it is expected that the operation can support a sizeable increase in copper production capacity.

Mine Exploration

In-fill core drilling was conducted in 2011 at the Buenavista zinc-copper-silver deposit, including directional drilling for geotechnical purposes. A deep drilling campaign was initiated in 2011 to explore the extent of the deposit at depth, drilling a total of 3,860 meters in 2012. For short-term mine planning, 6,652 meters were drilled to confirm copper grade and metallurgical recoveries. Also, in 2011, a condemnation drilling program was initiated to define areas for future infrastructure, as well as areas where leach and waste dumps will be deposited. A total of 28,369 meters of core drilling were completed in 2011. A geohydrology program was initiated in 2011 to explore the possibility of groundwater sources within the mine limits, and a total of 29,750 meters of diamond drilling were drilled in 2012. In addition, 3,797 meters were drilled for water monitoring wells. We did not have a drilling campaign in 2013. In 2014, we performed a drilling program of 20,000 meters in order to verify the reserves. In 2015, we complied with our drilling program target of 15,000 meters to define reserves and to confirm copper and molybdenum grades. In 2018, we drilled 4,434 meters to further define reserves and confirm grades.

Concentrator

Buenavista uses state-of-the-art computer monitoring systems at the concentrators, the crushing plant and the flotation circuit in order to coordinate inflows and optimize operations. In the original concentrator, material with a copper grade over 0.38% is loaded onto trucks and sent to the milling circuit, where giant rotating crushers reduce the size of the ore to approximately one-half of an inch. The ore is then sent to the ball mills, which grind it to the consistency of fine powder. The finely ground powder is agitated in a water and reagents solution and is then transported to flotation cells. Air is pumped into the cells producing a froth, which carries the copper mineral to the surface but not the waste rock, or tailings. Recovered copper, with the consistency of froth, is filtered and dried to produce copper concentrates with an average copper content of approximately 24%. Concentrates are then shipped by rail to the smelter at La Caridad.

In the second concentrator, material with a copper grade over 0.57% is sent to a three-phase milling circuit, where the ore size is reduced to approximately one-half inch. The ore is then sent to a circuit of six ball mills, which grind it to the consistency of fine powder. The finely ground powder is agitated in a water and reagents solution and is then transported to flotation cells. Air is pumped into the cells producing a froth, which carries the copper mineral to the surface but not the waste rock, or tailings. Recovered copper, with the consistency of froth, is filtered and dried to produce copper concentrates with an average copper content of approximately 24%. Concentrates are then sent by trucks or by railroad to the La Caridad smelter or to the Guaymas port, at Sonora, for exporting.

As part of the expansion program for this unit, in 2013 we completed the construction of the first molybdenum plant with an annual production capacity of 2,000 tons of molybdenum contained in

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concentrate. The plant was designed to process 1,500 tons of copper-molybdenum concentrates per day with a recovery of approximately 80% of copper and 50% of molybdenum content. The molybdenum plant consists of thickeners, homogenizer tanks, flotation cells, column cells and a holo-flite dryer. The second molybdenum plant obtained its first production lot in July 2016 and fully initiated operations in November 2016.

SX-EW Plant

The Buenavista unit operates a leaching facility and three SX-EW plants. All copper ore with a grade lower than the mill cut-off grade of 0.38%, but higher than 0.25%, is delivered to the leach dumps. A cycle of leaching and resting occurs for approximately five years in the run-of-mine dumps and three years for the crushed leach material.

There are three irrigation systems for the dumps and eleven dams for the pregnant leach solution (PLS). Plant I has four solvent extraction tanks with a nominal capacity of 18,000 liters per minute of PLS and 54 electrowinning cells and has a daily production capacity of 30 tons of copper cathodes with 99.999% purity. Plant II has five trains of solvent extraction with a nominal capacity of 62,000 liters per minute of PLS and 220 cells distributed in two bays and has a daily production capacity of 120 tons of copper cathodes with 99.9% purity. Plant III has three trains of solvent extraction with a nominal capacity of 167,100 liters per minute of PLS and 270 cells distributed in two bays and has a daily production capacity of 328 tons of copper cathodes with 99.9% purity. The plant produces copper cathodes of LME grade A. Please see "Capital Investment Program" under Item 7 for further information.

La Caridad

The La Caridad complex includes an open-pit mine, concentrator, smelter, copper refinery, precious metals refinery, rod plant, SX-EW plant, lime plant and two sulfuric acid plants.

La Caridad mine and mill are located about 23 kilometers southeast of the town of Nacozari in northeastern Sonora, at an altitude of 2,000 meters above sea level. Nacozari is about 264 kilometers northeast of the Sonora state capital of Hermosillo and 121 kilometers south of the U.S. Mexico border. Nacozari is connected by paved highway with Hermosillo and Agua Prieta and by rail with the international port of Guaymas, and the Mexican and United States rail systems. An airstrip with a reported runway length of 2,500 meters is located 36 kilometers north of Nacozari, less than one kilometer away from the La Caridad copper smelter and refinery. The smelter and the sulfuric acid plants, as well as the refineries and rod plant, are located approximately 24 kilometers from the mine. Access is by paved highway and by railroad.

The concentrator began operations in 1979, the molybdenum plant was added in 1982, the smelter in 1986, the first sulfuric acid plant in 1988, the SX-EW plant in 1995, the second sulfuric acid plant in 1997, the copper refinery in 1997, the rod plant in 1998, the precious metals refinery in 1999 and the dust and effluents plant in 2012.

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The table below sets forth 2018, 2017 and 2016 production information for La Caridad:

		2018	2017	2016	Variance 2018 - 2017	
					Volume	%
Mine annual operating days		365	365	366		
<i>Mine</i>						
Total ore mined	(kt)	34,675	34,699	34,648	(24)	(0.1)%
Copper grade	(%)	0.353	0.360	0.355	(0.007)	(1.9)%
Leach material mined	(kt)	30,764	36,540	41,342	5,776	(15.8)%
Leach material grade	(%)	0.221	0.230	0.228	(0.009)	(3.9)%
Stripping ratio	(x)	1.78	1.84	1.84	(0.06)	(3.3)%
Total material mined	(kt)	96,541	98,534	98,435	(1,993)	(2.0)%
<i>Concentrator</i>						
Total material milled	(kt)	34,548	34,548	34,539		
Copper recovery	(%)	87.09	85.51	85.66	1.58	1.9%
Copper concentrate	(kt)	446.2	443.3	447.1	2.9	0.7%
Copper in concentrate	(kt)	106.1	106.3	104.9	(0.2)	(0.2)%
Copper concentrate average grade	(%)	23.78	23.98	23.47	(0.20)	(0.8)%
<i>SX-EW plant</i>						
Estimated leach recovery	(%)	37.99	38.16	38.26	(0.17)	(0.5)%
SX-EW cathode production	(kt)	26.41	28.39	28.31	(1.98)	(7.0)%
<i>Molybdenum</i>						
Molybdenum grade	(%)	0.034	0.035	0.035	(0.001)	(2.9)%
Molybdenum recovery	(%)	83.28	82.50	81.15	0.78	1.0%
Molybdenum concentrate	(kt)	18.0	18.3	18.7	(0.3)	(1.6)%
Molybdenum concentrate average grade	(%)	54.61	54.31	52.96	0.3	0.6%
Molybdenum in concentrate	(kt)	9.8	9.9	9.9	(0.1)	(1.0)%

Key: kt = thousand tons

x = Stripping ratio obtained dividing waste plus leachable material by ore mined

The copper and molybdenum grade are total grade.

Geology

The La Caridad deposit is a typical porphyry copper and molybdenum deposit as seen also in the southwestern basin of United States. The La Caridad mine uses a conventional open-pit mining method. The ore body is at the top of a mountain, which gives La Caridad the advantage of a relative low waste-stripping ratio, natural pit drainage and relative short haul for both ore and waste. The mining method involves drilling, blasting, loading and haulage of ore mill and waste to the primary crushers and the leach materials and waste to dumps, respectively.

La Caridad deposit is located in northeastern Sonora, Mexico. The deposit is situated near the crest of the Sierra Juriquipa, about 23 kilometers southeast of the town of Nacozari, Sonora, Mexico. The Sierra Juriquipa rises to elevations of around 2,000 meters in the vicinity of La Caridad and is one of the many north-trending mountain ranges in Sonora that form a southern extension of the basin and range province.

The La Caridad porphyry copper-molybdenum deposit occurs exclusively in felsic to intermediate intrusive igneous rocks and associated breccias. Host rocks include diorite and granodiorite. These rocks are intruded by a quartz monzonite porphyry stock and by numerous breccia masses, which contain fragments of all the older rock types.

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Supergene enrichment consists of complete to partial chalcocite (Cu_2S) replacement of chalcopyrite (CuFeS_2). The zone of supergene enrichment occurs as a flat and tabular blanket with an average diameter of 1,700 meters and thickness generally between 0 and 90 meters.

Economic ore is found as disseminated sulfurs within the central part of the deposit. Sulfide-filled breccia cavities are most abundant in the intrusive breccia. This breccia-cavity mineralization occurs as sulfide aggregates which have crystallized in the spaces separating breccia clasts. Near the margins of the deposit, mineralization occurs almost exclusively in veinlets. Ore minerals include chalcopyrite (CuFeS_2), chalcocite (Cu_2S) and molybdenite (MoS_2).

Mine Exploration

The La Caridad ore body has been mined for over 35 years. The extent of the model area is approximately 6,000 meters by 4,000 meters with elevation ranging from 750 to 1,800 meters. Seventeen drilling campaigns have been conducted on the property since 1968. These campaigns drilled a total of 3,349 drill holes: 1,186 were diamond drill holes and 2,163 were reverse circulation. We have also drilled some hammer and percussion drill holes.

In 2008, La Caridad finished a large exploration program of 50,000 meters. The target was to reach to the 900 level in order to reduce the drilling space and to define the copper and molybdenum mineralization continuity and also carry out metallurgical testing for the flotation and leaching processes. There was no exploration program in 2009, 2011 and 2013. In 2012 we drilled 10,000 meters and further defined the extent of the copper and molybdenum mineralization. From 2014 to 2017 we drilled 96 diamond drill holes equivalent to 38,984 meters in order to define a high grade ore body located in the south western edge of the pit (Bella Union location). In 2018 we drilled 18 diamond drill holes equivalent to 5,132 meters in the Bella Union location.

Concentrator

La Caridad uses state-of-the-art computer monitoring systems at the concentrator, the crushing plant and the flotation circuit in order to coordinate inflows and optimize operations. The concentrator has a current capacity of 94,500 tons of ore per day.

Ore extracted from the mine with a copper grade over 0.30% is sent to the concentrator and is processed into copper concentrates and molybdenum concentrates. The copper concentrates are sent to the smelter and the molybdenum concentrate is sold to a Mexican customer. The molybdenum recovery plant has a capacity of 2,000 tons per day of copper-molybdenum concentrates. The lime plant has a capacity of 340 tons of finished product per day.

SX-EW Plant

Approximately 856.8 million tons of leaching ore with an average grade of approximately 0.251% copper have been extracted from the La Caridad open-pit mine and deposited in leaching dumps from May 1995 to December 31, 2018. All copper ore with a grade lower than the mill cut-off grade 0.30%, but higher than 0.15% copper, is delivered to the leaching dumps. In 1995, we completed the construction of a SX-EW facility at La Caridad that has allowed processing of this ore and certain leach ore reserves that were not mined and has resulted in a reduction in our copper production costs. The SX-EW facility has an annual design capacity of 21,900 tons of copper cathodes.

The plant has three trains of solvent extraction with a nominal capacity of 2,400 cubic meters per hour and 94 electrowinning cells distributed in one single electrolytic bay. The plant has a daily production capacity of 65 tons of copper cathodes with 99.999% purity.

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Processing Facilities La Caridad

Our La Caridad complex includes a smelter, an electrolytic copper refinery, a precious metal refinery, a copper rod plant and an effluent and dust treatment plant. The distance between this complex and the La Caridad mine is approximately 24 kilometers.

Smelter

Copper concentrates from Buenavista, Santa Barbara, Charcas and La Caridad are transported by rail and truck to the La Caridad smelter where they are processed and cast into copper anodes of 99.2% purity. Sulfur dioxide off-gases collected from the flash furnace, the El Teniente converter and conventional converters are processed into sulfuric acid at two sulfuric acid plants. Approximately 2% to 3% of this acid is used by our SX-EW plants and the balance is sold to third parties.

All of the anodes produced in the smelter are sent to the La Caridad copper refinery. The actual installed capacity of the smelter is 1,000,000 tons per year, a capacity that is sufficient to treat all the concentrates of La Caridad and almost 40.5% of total production of the OMIMSA I and OMIMSA II concentrators from Buenavista, and starting in 2010, the concentrates from the IMMSA mines, as we closed the San Luis Potosi smelter.

Other facilities in the smelter include two sulfuric acid plants with capacities of 2,625 and 2,135 tons per day, three oxygen plants each with a production capacity of 275 tons per day; and one power turbine which generates 11.5 MWh.

Refinery

La Caridad includes an electrolytic copper refinery that uses permanent cathode technology. The installed capacity of the refinery is 300,000 tons per year. The refinery consists of an anode plant with a preparation area, an electrolytic plant with an electrolytic cell house with 1,115 cells and 32 liberator cells, two cathode stripping machines, an anode washing machine, a slime treatment plant and a number of ancillary installations. The refinery is producing grade A (LME) and grade 1 (COMEX) copper cathode of 99.99% purity. Anodic slimes are recovered from the refining process and sent to the slimes treatment plant where additional copper is extracted. The slimes are then filtered, dried, packed and shipped to the La Caridad precious metals refinery to produce silver and gold.

Precious Metals Plant

The operations of the precious metal refinery begin with the reception of anodic slimes, which are dried in a steam dryer. After this, the dried slime is smelted and a gold and silver alloy is obtained, which is known as Dore. The precious metal refinery plant has a hydrometallurgical stage and a pyrometallurgical stage, besides a steam dryer, Dore casting system, Kaldo furnace, 20 electrolytic cells in the silver refinery, one induction furnace for fine silver, one silver ingot casting system and two reactors for obtaining fine gold. The process ends with the refining of the gold and silver alloy. We also recover commercial selenium from the gas produced by the Kaldo furnace process.

Copper Rod Plant

A rod plant at the La Caridad complex began operations in 1998 and reached its full annual operating capacity of 150,000 tons in 1999. The plant is producing eight millimeter copper rods with a purity of 99.99%.

Effluent and Dust Treatment Plant

In 2012, we started operating a dust and effluent plant with a treatment capacity of 5,000 tons of smelter dusts per year which will produce 1,500 tons of copper by-products and 2,500 tons of lead sulfates per year. This plant is designed to reduce dust emissions from La Caridad metallurgical complex.

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The table below sets forth 2018, 2017 and 2016 production information for the La Caridad processing facilities:

		2018	2017	2016	Variance 2018 - 2017	
					Volume	%
<i>Smelter</i>						
Total copper concentrate smelted	(kt)	1,041.7	997.7	1,004.8	44.0	4.4%
Anode copper production	(kt)	287.7	271.8	269.5	15.9	5.9%
Average copper content in anode	(%)	99.49	99.41	99.38	0.08	0.1%
Average smelter recovery	(%)	96.9	97.4	96.8	(0.5)	(0.5)%
Sulfuric acid production	(kt)	1,002.5	976.4	1,007.9	26.1	2.7%
<i>Refinery</i>						
Refined cathode production	(kt)	239.2	228.1	224.2	11.1	4.9%
Refined silver production	(000 kg)	264.3	222.5	256.9	41.8	18.8%
Refined gold production	(Kg)	1,228.5	1,264.2	4,805.8	(35.7)	(2.8)%
<i>Rod Plant</i>						
Copper rod production	(kt)	147.1	133.1	144.5	14.0	10.5%

Key: kt = thousand tons

Kg = kilograms

MEXICAN IMMSA UNIT

Our IMMSA unit (underground mining poly-metallic division) operates five underground mining complexes situated in central and northern Mexico and produces zinc, lead, copper, silver and gold, and has a coal mine. These complexes include industrial processing facilities for zinc, lead, copper and silver. All of IMMSA's mining facilities employ exploitation systems and conventional equipment. We believe that all the plants and equipment are in satisfactory operating condition. IMMSA's principal mining facilities include Charcas, Santa Barbara, San Martin, Santa Eulalia and Taxco.

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The table below sets forth 2018, 2017 and 2016 production information for our Mexican IMMSA unit:

		2018	2017	2016	Variance 2018 - 2017	
					Volume	%
Average annual operating days(*)		353	352	353		
Total material mined and milled	(kt)	3,277	2,871	3,031	406	14.1%
Zinc:						
Zinc average ore grade	(%)	2.51	2.76	2.81	(0.25)	(9.0)%
Zinc average recovery	(%)	86.07	86.75	86.93	(0.68)	(0.8)%
Zinc concentrate produced	(kt)	135.3	129.2	140.0	6.1	4.7%
Zinc concentrate average grade	(%)	52.30	53.13	52.96	(0.83)	(1.6)%
Zinc in concentrate	(kt)	70.8	68.7	73.9	2.1	3.1%
Lead:						
Lead average ore grade	(%)	0.91	0.95	1.00	(0.04)	(5.0)%
Lead average recovery	(%)	74.32	73.91	80.41	0.41	0.6%
Lead concentrate produced	(kt)	39.1	33.6	40.7	5.5	16.4%
Lead concentrate average grade	(%)	56.51	60.29	59.88	(3.8)	(6.3)%
Lead in concentrate	(kt)	22.1	20.2	24.4	1.9	9.4%
Copper:						
Copper average ore grade	(%)	0.35	0.35	0.37		
Copper average recovery	(%)	54.56	54.65	56.83	(0.09)	(0.2)%
Copper concentrate produced	(kt)	23.5	21.3	24.9	2.2	10.3%
Copper concentrate average grade	(%)	26.45	25.71	25.86	0.73	2.9%
Copper in concentrate	(kt)	6.2	5.5	6.4	0.7	12.7%
Silver:						
Silver average ore grade	(ounces)	2.25	2.19	2.35	0.06	2.7%
Silver average recovery	(%)	76.59	75.72	79.41	0.87	1.2%
Silver concentrate average grade	(%)	28.5	25.8	30.4	2.7	10.5%
Silver in concentrates	((000) ounces)	5,649.5	4,759.9	5,622.0	889.6	18.7%

kt = thousand tons

(*) Weighted average annual operating days based on total material mined and milled in the three active mines: Charcas, Santa Barbara, and Santa Eulalia.

Charcas

The Charcas mining complex is located 111 kilometers north of the city of San Luis Potosi in the State of San Luis Potosi, Mexico. Charcas is connected to the state capital by a paved highway of 130 kilometers. It was discovered in 1573 and operations in the 20th century began in 1911. The complex includes three underground mines (San Bartolo, Rey-Reina and La Aurora) and one flotation plant that produces zinc, lead and copper concentrates, with significant amounts of silver. The Charcas mine is characterized by low operating costs and good quality ores and is situated near the zinc refinery. Regarding its geology, economic ore is found as replacement sulfurs in carbonates host rock. The ore mineralogy is comprised predominantly of calcopyrite (CuFeS₂), sphalerite (ZnS), galena (PbS) and silver minerals as diaphorite (Pb₂Ag₃Sb₃S₈). The Charcas mine is now Mexico's largest producer of zinc.

In October 2015, an earthquake damaged some underground facilities as well as the access to the mine. Consequently, normal mine operations were interrupted. In 2016, operations took place normally and a production compliance of 97% was reached.

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Mine exploration in 2015 included 32,144 meters of surface drilling and 20,536 meters from underground stations, which increased our reserves by 3,089,797 tons. For 2016, it included 20,000 meters of surface drilling and 20,754 meters from underground stations, which increased our reserves by 1,778,728 tons. For 2017, it included 5,999 meters of surface drilling and 23,098 meters from underground stations, which increased our reserves by 2,004,577 tons. For 2018, 11,757 meters of diamond drilling and 20,285 meters from underground stations were drilled, which increased our reserves by 2,282,322 tons. For 2019, 25,000 meters of diamond drilling are planned to identify additional reserves.

Santa Barbara

The Santa Barbara mining complex is located approximately 26 kilometers southwest of the city of Hidalgo del Parral in southern Chihuahua, Mexico. The area can be reached via paved road from Hidalgo del Parral, a city on a federal highway. It was discovered in 1536 and mining activities in the 20th century began in 1913. Santa Barbara includes three main underground mines (San Diego, Segovedad and Tecolotes) and a flotation plant and produces lead, copper and zinc concentrates, with significant amounts of silver.

Regarding its geology, economic ore minerals include sphalerite (ZnS), marmatite (ZnFeS), galena (PbS), chalcopyrite (CuFeS₂) and tetrahedrite (CuFe₁₂Sb₄S₁₃). Due to the variable characteristics of the ore bodies, four types of mining methods are used: shrinkage stoping, long-hole drilled open stoping, cut-and-fill stoping and horizontal bench stoping. The ore, once crushed, is processed in the flotation plant to produce concentrates.

Mine exploration in 2015 included 5,977 meters of surface drilling and 16,609 meters from underground stations, which increased our reserves by 1,135,750 tons. For 2016, it included 14,300 meters from underground stations, which increased our reserves by 1,416,756 tons. For 2017, it included 2,571 meters of surface drilling and 11,838 meters from underground stations, which increased our reserves by 613,872 tons. For 2018, 10,769 meters from underground stations were drilled, which increased our reserves by 418,345 tons. For 2019, 14,160 meters of diamond drilling are planned to identify additional reserves.

Santa Eulalia

The mining district of Santa Eulalia is located in the central part of the state of Chihuahua, Mexico, approximately 26 kilometers east of the city of Chihuahua, and is connected to the city of Chihuahua by a paved road (highway no. 45). It was discovered in 1590 but exploitation began in 1870. The main mines in Santa Eulalia are The Buena Tierra mine and the San Antonio mine.

Regarding its geology, the mineralization corresponds in its majority to ore skarns: silicoaluminates of calcium, iron and manganese with variable quantities of lead, zinc, copper and iron sulfides. Economic ore include sphalerite (ZnS), galena (PbS) and small quantities of pyrrargyrite (Ag₃SbS₃).

Mine exploration in 2015 included 3,014 meters from underground stations, which increased our reserves by 64,800 tons. For 2017, it included 936 meters from underground stations, which increased our reserves by 60,525 tons. For 2018, 1,930 meters from underground stations were drilled, which increased our reserves by 249,930 tons. For 2019, 8,700 meters of diamond drilling from underground stations in San Antonio and Buena Tierra are planned to identify additional reserves.

San Martin and Taxco

The San Martin mining complex is located in the municipality of Sombrerete in the western part of the state of Zacatecas, Mexico. It was discovered in 1555 and mining operations in the 20th century

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began in 1949. The complex includes an underground mine and a flotation plant. The ore body contains lead, copper and zinc concentrates, with significant amounts of silver.

After eleven years of an illegal stoppage, we resumed control of the San Martin mine in August 2018. The San Martin facilities deteriorated during this period and we are undertaking a major renovation in order to restart operations, with an estimated capital budget of \$77 million.

The Taxco mining complex has been on strike since July 2007. It is located on the outskirts of the city of Taxco in the northern part of the state of Guerrero, Mexico. It was discovered in 1519 and mining activities in the 20th century began in 1918. The complex includes several underground mines (San Antonio, Guerrero and Remedios) and a flotation plant. The ore contains lead and zinc concentrates, with some amounts of gold and silver.

There was no mine exploration drilling in San Martin and Taxco during the three years ended December 31, 2018 because of the strikes. Please see Note 12 "Commitments and Contingencies Labor matters" to our consolidated financial statements.

Processing Facilities San Luis Potosi

Our San Luis Potosi electrolytic zinc refinery is located in the city of San Luis Potosi, in the state of San Luis Potosi, Mexico. The city of San Luis Potosi is connected to our refinery by a major highway.

Zinc Refinery

The San Luis Potosi electrolytic zinc refinery was built in 1982 and was designed to produce 105,000 tons of refined zinc per year by treating up to 200,000 tons of zinc concentrate from our own mines, principally Charcas, which is located 113 kilometers from the refinery. The refinery produces special high grade zinc (99.995%), high grade zinc (over 99.9%) and zinc-based alloys with aluminum, lead, copper or magnesium in varying quantities and sizes depending on market demand. Refined silver and gold production is obtained from tolling services provided by a third party mining company.

The electrolytic zinc refinery has an acid plant, a steam recovery boiler and a roaster. There is also a calcine processing area with five leaching stages: neutral, hot acid, intermediate acid, acid, purified fourth and jarosite, as well as two stages for solution purifying.

The table below sets forth 2018, 2017 and 2016 production information for our San Luis Potosi zinc refinery:

		2018	2017	2016	Variance 2018 - 2017	
					Volume	%
Total zinc concentrate treated	(kt)	204.0	202.3	202.0	1.7	0.84%
Refined zinc produced	(kt)	107.5	104.4	106.1	3.1	3.0%
Sulfuric acid produced	(kt)	184.2	180.6	181.3	3.6	2.0%
Refined silver produced	(kt)	16.8	14.5	10.5	2.3	15.9%
Refined gold produced	(k)	23.8	17.8	14.4	6.0	33.1%
Refined cadmium produced	(kt)	0.6	0.6	0.7		
Average refinery recovery	(%)	94.4	94.3	93.8	0.1	0.1%

kt = thousand tons

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The Nueva Rosita coal and coke complex began operations in 1924 and is located in the state of Coahuila, Mexico, on the outskirts of the city of Nueva Rosita near the Texas border. It includes (a) an underground coal mine, which has been closed since 2006; (b) an open-pit mine with a yearly capacity of approximately 350,000 tons of coal; (c) a coal washing plant with a capacity of 900,000 tons per year that produces high quality clean coal; and d) a re-engineered and modernized 21 ovens coke facility capable of producing 100,000 tons of coke per year (metallurgical, nut and fine) of which, 95,000 tons are metallurgical coke. There is also a by-product plant to clean the coke gas oven in which tar, ammonium sulfate and light crude oil are recovered. There are also two boilers, which produce 80,000 pounds of steam that is used in the by-products plant. In September 2017, a decision was made to close the coke plant, and initiate the cleaning and remediation process.

Carbon mine exploration

In Coahuila, an intensive exploration program of diamond drilling has identified two additional areas, Esperanza with a potential for more than 30 million tons of "in place" mineralized coal and Guayacan with a potential for 15 million tons of "in place" mineralized coal, that could be used for a future coal-fired power plant. In 2015, we drilled 3,046 meters and increased our reserves by 465,509 tons. In 2016, we drilled 1,052 meters and finished the last stage of exploration in two areas for open pit, San Jose y Cuatro y medio, and increased reserves by 607,532 tons. In 2017 and 2018, we did not undertake exploration activities.

The table below sets forth 2018, 2017 and 2016 production information for our Nueva Rosita coal and coke complex:

		Variance 2018 - 2017				
		2018	2017	2016	Volume	%
Coal mined open-pit	(kt)	108.6	132.7	194.3	(24.1)	(18.0)%
Average BTU content	BTU/Lb	10,022	10,022	9,485		
Average percent sulfur	%	1.38	1.38	1.49		
Clean coal produced	(kt)	42.8	66.4	86.2	(23.6)	(36.0)%
Coke tonnage produced	(kt)		45.4	71.7	(45.4)	(100.0)%
Average realized price Coal	(\$ per ton)	39.0	29.2	40.2	9.8	34.0%
Average realized price Coke	(\$ per ton)	265.0	233.0	215.0	32.0	14.0%

kt = thousand tons

ORE RESERVES

Ore reserves are those estimated quantities of proven and probable material that may be economically mined and processed for extraction of their mineral content, at the time of the reserve determination. "Proven" (measured) reserves are reserves for which (a) quantity is computed from dimensions revealed in outcrops, trenches, workings or drill holes; (b) grade and/or quality are computed from the results of detailed samplings; and (c) the sites for inspection, sampling and measurement are spaced so closely and the geologic character is so well defined that size, shape, depth and mineral content of reserves are well-established. "Probable" (indicated) reserves are reserves for which quantity and grade and/or quality are computed from information similar to that used for proven (measured) reserves, but the sites for inspection, sampling, and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance, although lower than that for proven (measured) reserves, is high enough to assume continuity between points of observation. "Mineralized material," on the other hand, is a mineralized body that has been delineated by appropriately spaced

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drilling and/or underground sampling to support the reported tonnage and average grade of metal(s). Such a deposit does not qualify as a reserve until legal and economic feasibility are concluded based upon a comprehensive evaluation of unit costs, grade, recoveries and other material factors.

Our proven and probable ore reserve estimates are based on engineering evaluations of assay values derived from the sampling of drill holes and other openings. We believe that the samplings taken are spaced at intervals close enough and the geological characteristics of the deposits are sufficiently well defined to render the estimates reliable. The ore reserves estimates include assessments of the resource, mining and metallurgy, as well as economic, marketing, legal, environmental, governmental, social and other necessary considerations.

Our Peruvian operations, including the Toquepala and Cuajone reserves, are classified into proven (measured), probable (indicated) and possible (inferred) categories based on a Relative Confidence Bound Index ("RCB Index") that measures our level of geologic knowledge and confidence in each block. The RCB index is a measure of relative confidence in the block grade estimate. This approach combines the local variability of the composites used to krig a block with the kriging variance and incorporates the use of confidence intervals in measuring uncertainty of the block estimates relative to each other. The final resource classification is then based on the distribution of these RCB values for blocks above 0.05% copper. It is the distribution that is used to find the breaks between proven/probable and probable/possible.

Our Mexican operations, including the Buenavista and La Caridad reserves, are calculated using a mathematical block model and applying the MineSight software system. The estimated grades per block are classified as proven and probable. These grades are calculated applying a three-dimensional interpolation procedure and the inverse distance squared. Likewise, the quadrant method or spherical search is implemented in order to limit the number of composites that will affect the block's interpolated value. The composites data is derived from the geological exploration of the ore body. In order to classify the individual blocks in the model, a thorough geostatistical variogram analysis is conducted, taking into consideration the principal characteristics of the deposit. Based on this block model classification, and with the implementation of the Lerch-Grossman algorithm, and the MineSight Pit Optimizer procedure, mineable reserves are determined. The calculated proven and probable reserves include those blocks that are economically feasible to mine by open-pit method within a particular mine design.

For the IMMSA unit, the basis for reserve estimations are sampling of mining operations and drilling exploration, geographical and topographic surveys, tracking down all the foregoing in the corresponding maps, measurement, calculation and interpretation based on the maps and reports from the mines, the mills and/or smelters. Mineral reserves are mineral stock which is estimated for extraction, to exploit if necessary, to sell or utilize economically, all or in part, taking into consideration the quotations, subsidies, costs, availability of treatment plants and other conditions which we estimate will prevail in the period for which reserves are being calculated. The reserves are divided into proven (85% reliable or more according to statistical studies) and probable (70% - 80% reliable or more according to statistical studies) categories according to their level of reliability and availability. In order to comply with SEC regulations, proven reserves is a classification that can only be used for such mineral found on top of the last level of the mine (either mineral up to 15 meters below the last level or below the first 15 meters only with sufficient drilling (25 or 30 meters between each drill)).

Annually our engineering department reviews in detail the reserve computations. In addition, our engineering department reviews the computation when changes in assumptions occur. Changes can occur for price or cost assumptions, results in field drilling or new geotechnical parameters. We also engage third party consultants to review mine planning procedures.

Pursuant to SEC guidance, the reserves information in this report are calculated using average metals prices over the most recent three years unless otherwise stated. We refer to these three-year

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average metals prices as "current prices." Our current prices for copper are calculated using prices quoted by COMEX, and our current prices for molybdenum are calculated according to Platt's Metals Week. Unless otherwise stated, reserves estimates in this report use \$2.64 per pound for copper and \$8.88 per pound for molybdenum, both current prices as of December 31, 2018. The current prices for copper and molybdenum were \$2.50 and \$7.07 as of December 31, 2017 and \$2.61 and \$8.10 as of December 31, 2016, respectively.

For internal ore reserve estimation, our management uses long-term metal price assumptions for copper and molybdenum, which are intended to approximate average prices over the long term. At December 31, 2018 and 2017, we considered \$2.90 per pound of copper and \$7.50 per pound of molybdenum.

The average metal prices over the last 10 and 15 years periods and the continued positive outlook for these metals have led us to use these prices. For other forecast and planning purposes, particularly related to merger and acquisition activities, our management considers other price scenarios. These changes, however, do not affect the preparation of our financial statements.

For the years 2018, 2017 and 2016, we have used reserve estimates based on current average prices as of the most recent three years then ended to determine amortization of mine development and intangible assets.

We periodically reevaluate estimates of our ore reserves, which represent our estimate as to the amount of unmined copper remaining in our existing mine locations that can be produced and sold at a profit. These estimates are based on engineering evaluations derived from samples of drill holes and other openings, combined with assumptions about copper market prices and production costs at each of our mines.

The persons responsible for ore reserve calculations are as follows:

Peruvian open-pit:

Cuajone mine Edgar A. Peña Valenzuela, Mine Engineering Superintendent
Toquepala mine Wilbert Perez, Mine Engineering Superintendent

Tia Maria project:

Jaime Arana Murriel, Investment Projects Leaching Manager

Los Chancas project:

Jaime Arana Murriel, Investment Projects Leaching Manager
Juan Fernando Núñez Chavez, Technical Manager of Explorations

Mexican open-pit:

La Caridad Mine Gilberto Quintana, Mine Manager
Buenavista mine Jesus Molinares, Engineering and Mine Planning Superintendent

IMMSA unit:

Santa Barbara Raul Guerrero Valdez, Manager
Charcas Juan J. Aguilar, Planning and Control Superintendent
Santa Eulalia Jose Rovelo Saenz, Manager
Taxco Jose M. Espinosa, Manager
San Martin Maria I. Carrillo, Planning Manager

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El Arco project:

Michelle P. Cerecer A., Planning Engineer (with support of Hexagon Mining)

El Pilar project:

Michelle P. Cerecer A., Planning Engineer (with support of Hexagon Mining)

Pilares project:

Michelle P. Cerecer A., Planning Engineer (with support of Hexagon Mining)

For more information regarding our reserve estimates, please see Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations Critical Accounting Policies and Estimates Ore Reserves."

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Ore Reserves Estimated at Current Prices:

The table below details our estimated proven and probable copper and molybdenum reserves at December 31, 2018 based on the last three year average market prices following SEC guidance:

	PERUVIAN OPEN-PIT UNIT		MEXICAN OPEN-PIT UNIT		TOTAL OPEN-PIT MINES	MEXICAN IMMSA UNIT(2)	DEVELOPMENT PROJECTS			
	Cuajone Mine(1)	Toquepala Mine(1)	Buenvista Mine(1)	La Caridad Mine(1)			Tia Maria	El Arco	El Pilar	Pilares
Mineral Reserves										
Metal prices:										
Copper (\$/lb.)	2.6424	2.6424	2.6424	2.6424	2.642	2.642	2.642	2.642	2.642	2.642
Molybdenum (\$/lb.)	8.876	8.876	8.876	8.876	8.876		8.876			
Cut-off grade	0.215%	0.234%	0.171%	0.112%	0.176%		0.207%	0.150%	0.150%	
Proven										
Sulfide ore reserves (kt)	1,016,568	1,885,610	2,760,641	2,119,208	7,782,027	18,102		1,368,191		13,026
Average grade:										
Copper	0.570%	0.556%	0.461%	0.227%	0.435%	0.460%		0.443%		0.768%
Molybdenum	0.019%	0.033%	0.008%	0.029%	0.021%			0.007%		
Lead							1.210%			
Zinc							2.710%			
Leachable material (kt)	725	653,441	1,912,370	429,028	2,995,564		213,559	188,689	255,756	249
Leachable material grade	0.625%	0.214%	0.169%	0.185%	0.181%		0.329%	0.330%	0.297%	0.241%
Probable										
Sulfide ore reserves (kt)	749,563	179,051	1,341,362	1,124,643	3,394,619	29,166		985,147		31,447
Average grade:										
Copper	0.408%	0.367%	0.407%	0.212%	0.341%	0.510%		0.404%		0.692%
Molybdenum	0.016%	0.012%	0.009%	0.030%	0.018%			0.007%		
Lead							0.890%			
Zinc							2.750%			
Leachable material (kt)	3,093	1,038,707	739,766	150,927	1,932,493		517,552	66,103	13,225	928
Leachable material grade	0.752%	0.146%	0.147%	0.174%	0.150%		0.368%	0.159%	0.275%	0.252%
Total										
Sulfide ore reserves (kt)	1,766,131	2,064,661	4,102,003	3,243,851	11,176,646	47,268		2,353,337		44,473
Average grade:										
Copper	0.501%	0.540%	0.443%	0.222%	0.406%	0.491%		0.427%		0.715%
Molybdenum	0.018%	0.031%	0.008%	0.030%	0.020%			0.007%		
Lead							1.013%			
Zinc							2.735%			
Leachable material (kt)	3,818	1,692,148	2,652,136	579,955	4,928,057		731,111	254,792	268,981	1,178
Leachable material grade	0.728%	0.172%	0.163%	0.182%	0.169%		0.356%	0.286%	0.296%	0.250%
Waste (kt)	4,672,393	7,738,634	5,742,183	2,353,527	20,506,737		654,239	2,107,905	418,441	162,033
Total material (kt)	6,442,342	11,495,443	12,496,322	6,177,333	36,611,440	47,268	1,385,350	4,716,034	687,422	207,684
Stripping ratio ((W+L)/O)	2.65	4.57	2.05	0.90	2.28			1.00		3.67
Stripping ratio (W/(L+O))	2.64	2.06	0.85	0.62	1.27		0.89	0.81	1.56	3.55
Leachable material										
	18,332	1,550,834	1,676,237	866,311	4,111,714					

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Reserves in stock
(kt)

Average copper grade	0.486%	0.155%	0.161%	0.243%	0.178%					
In pit reserves:										
Proven (kt)	725	653,441	1,912,370	429,028	2,995,564	213,559	188,689	255,756	249	
Average copper grade	0.625%	0.214%	0.169%	0.185%	0.181%	0.329%	0.330%	0.297%	0.241%	
Probable (kt)	3,093	1,038,707	739,766	150,927	1,932,493	517,552	66,103	13,225	928	
Average copper grade	0.752%	0.146%	0.147%	0.174%	0.150%	0.368%	0.159%	0.275%	0.252%	
Total leachable reserves (kt)	22,150	3,242,982	4,328,373							