science for a changing world

2010 Minerals Yearbook

CHILE [ADVANCE RELEASE]

U.S. Department of the Interior
U.S. Geological Survey

May 2012

The Mineral Industry of Chile

By Steven T. Anderson

Chile's position in the world mineral economy was as a leading supplier of many minerals in crude form, especially metals associated with the mining of copper and industrial minerals (such as lithium carbonate and potash) obtained from mining the salars and arid areas in the country. At the end of 2009, the country was estimated to have the leading reserves of copper, lithium, rhenium, and selenium (tied with Russia) in the world; the second ranked reserves of iodine and silver; and the third ranked reserves of molybdenum. Chile was also estimated to have globally significant (equal to or greater than 5% of the world total) reserves of gold, and a substantial proportion of the gold and silver reserves were associated with the copper reserves at some of the major porphyry copper deposits in the country. Chile was estimated to have accounted for less than 2% of global potash reserves (Servicio Nacional de Geología y Minería, 2010, p. 14–16, 47–55; Brooks, 2011b; Edelstein, 2011; George, 2011a, b; Jasinski, 2011; Jaskula, 2011; Polyak, 2011a, b).

In 2010, Chile remained the world's leading producer of copper, accounting for 34% of world mine production; iodine (60%[1] of world mine production); rhenium (52%); and lithium (mostly in the form of lithium carbonate) (35%[1]). The country was estimated to have been the world's second ranked producer of arsenic (accounting for an estimated 21% of world production) and (total) refined copper (17%), and the third ranked producer of mined boron (ulexite) (19%[1]) and molybdenum (about 15%). It was the world's fifth ranked producer of silver (6% of world mine output), and the sixth ranked producer of pumicite (5%) and refined selenium (3%[1]). Chile was estimated to have accounted for about 2% the world's mine output of diatomite, gold, potash (K_2O content), and salt (NaCl), and for about 2% of global production of sulfur (Angulo, 2011a, b; Apodaca, 2011; Brooks, 2011a; Comisión Chilena del Cobre, 2011, p. 136–137, 140–141, 143–145; Crangle, 2011a, b; George, 2011b; Jasinski, 2011; Jaskula, 2011; Kostick, 2011; Polyak, 2011b).

Minerals in the National Economy

In 2010, total mine production accounted for about 19.2% ($39 billion[2]) of the country's gross domestic product (GDP) compared with 15.6% ($25 billion) in 2009, and copper mine production was valued at about $35 billion compared with about $22 billion in 2009. In real terms,[3] the total value of mine production increased by about 1.2% compared with that of 2009, mostly owing to an increase of about 1.7% in the real value of the country's copper mine production; the real value of all noncopper mine production decreased by about 1% during the same timeframe (Banco Central de Chile, 2011a, p. 40–41, 44–46; Comisión Chilena del Cobre, 2011, p. 68–69; International Monetary Fund, 2011).

The mineral trade balance of Chile (including crude petroleum and natural gas) increased to about $30 billion compared with $19.8 billion in 2009. The value of the country's exports of nonfuel mineral products (the leading mineral export sector) increased to $46 billion from $31.4 billion in 2009, and the value of the country's imports of mineral fuels and related materials (the leading mineral import sector) increased to $11.4 billion from $9 billion in 2009 (Banco Central de Chile, 2011b, p. 31, 61).

At current prices, labor costs in the mineral industry continued to increase during 2010. The total wage bill for all mining and the extraction of crude petroleum increased to $3.12 billion compared with about $2.67 billion in 2009. In 2010, mining and the extraction of crude petroleum employed 66,063 workers compared with 62,102 workers in 2009 and 64,268 in 2008. Workers directly employed in mining and the extraction of crude petroleum accounted for only about 1% of all employees in Chile, but this figure does not include the large number of workers who provided necessary services for these mineral extraction sectors (such as administrative, consulting, legal, marketing, security, and transportation services), those who were employed in domestically producing downstream mineral-based products from the raw minerals extracted in Chile, and those whose jobs otherwise critically depended on the extraction of minerals in the country (Servicio Nacional de Geología y Minería, 2010, p. 17–18; 2011, p. 17–18; Comisión Chilena del Cobre, 2011, p. 73).

Government Policies and Programs

On October 13, 2010, the Government approved additional taxes on mining companies and other corporations to help with reconstruction following an earthquake in northern Chile on February 27. These new taxes were expected to be phased in starting in 2011. On June 16, 2005, the Government had approved Law 20.026 to establish a mining-specific tax (royalty), which modified both the applicable Mining Code (approved on September 26, 1983) and the 1974 foreign investment statute, known as Decree Law 600 (D.L. 600). The tax, which is assessed on a per-company basis, took effect at the beginning of 2006 and applies only if the total value of mine production by a single company exceeds the average value of 12,000 metric tons (t) of copper during the year. The royalty rates that mining companies were estimated to be paying in 2010 was between 4% and 5%, and the new taxes to help fund earthquake reconstruction projects could expand the effective royalties rate on mining companies to between 4% and 9%.

---

[1]Excludes production by the United States.

[2]Where necessary, nominal values have been converted from Chilean pesos (Ch$) to U.S. dollars (US$) at an annual average exchange rate of Ch$559.61=US$1.00 for 2009 and about Ch$510.23=US$1.00 for 2010. All values are nominal, at current prices, unless otherwise stated.

[3]Real values are adjusted for inflation using constant 2003 prices.

Before passage of the mining-specific tax law in 2005, the most recent significant modifications of the Mining Code had been through approval of a Mining Safety Act on December 30, 2002. The main environmental law was Decree Law 19.300, which was approved on March 9, 1994, and was supplemented on December 7, 2002, by approval of Decreto Supremo 95, which is a Government decree that requires environmental impact statements for any new investment projects that involve either exploration for or extraction of the country's natural resources (including minerals). Decreto Supremo 95 is the primary statute for environmental regulation of mining concessions in Chile (Rojas and others, 2006, p. 360–362; Biblioteca del Congreso Nacional de Chile, 2008; Economist, The, 2010a, b; Henriquez, 2010; CAP S.A., 2011, p. 2).

In 2006, the Government passed the Fiscal Responsibility Law (FRL) that created two funds to manage increased revenues from mining royalty payments and from the state-owned mining company Corporación Nacional del Cobre (CODELCO). The FRL extends the commitment of the Government to a structural fiscal surplus rule that was established in 2000 to help insulate the economy from fluctuations in mineral commodity prices. During a boom period (as during 2007), this rule allows the Government to spend only the portion of the surplus revenue that is considered permanent and to save the transitory portion. (Transitory Government surpluses from the copper sector have been termed "copper windfall revenues.") As part of the FRL, a panel of six members was selected to form a financial advisory council to advise the Minister of Finance concerning investment guidelines and other matters related to the two funds, including helping to determine what portion of the surplus mining revenues was permanent and what portion was transitory. The first fund is called the Economic and Social Stabilization Fund (ESSF) and was established with an initial investment of about $6 billion in 2006, mostly from the closure of the old Copper Stabilization Fund (established in 1985); the second fund is called the Pension Reserve Fund and was established with an initial investment of $600 million. At the end of 2010, the two funds contained about $12.7 billion and $3.84 billion in assets, respectively, compared with $11.3 billion and $3.42 billion, respectively, at yearend 2009 (International Monetary Fund, 2009, p. 60; Kumhof and Laxton, 2009, p. 25; Ministerio de Hacienda, 2011, p. 10).

The Chilean Government, through the Ministerio de Minería, exercises control of the mineral industry through three state-owned companies and four regulatory agencies. The state-owned companies that are significant to the mineral industry include CODELCO, some subsidiaries of Corporación de Fomento de la Producción (CORFO), and Empresa Nacional de Minería (ENAMI). The specific subsidiaries of CORFO that are significant to the mineral industry include Cía. Chilena de Electricidad S.A., Empresa Nacional del Carbón S.A. (ENACAR), and Empresa Nacional del Petróleo S.A. (ENAP). The four regulatory agencies are Comisión Chilena del Cobre (COCHILCO), the Comisión Nacional del Medio Ambiente (CONAMA), Comité de Inversiones Extranjeras (CIE), and the Servicio Nacional de Geología y Minería (SERNAGEOMIN).

Production

In 2010, the Fe content of iron ore production increased by 17% compared with that of 2009, but production of pig iron and crude steel decreased by 31% and 23%, respectively, during the same timeframe. This was because the earthquake caused CAP S.A. of Chile to suspend production of pig iron and crude steel for about 4 months, but production of iron ore by Compañía Minera del Pacífico S.A. (CMP) (a 100%-owned subsidiary of CAP) was basically unaffected. On May 25, 2009, CMP suspended production of manganese ore and concentrates by Manganesos Atacama S.A. (MASA) (another subsidiary of CAP) owing to insufficient demand, and MASA did not produce any manganese through the end of 2010 (table 1; Business News Americas Ltda., 2010; CAP S.A., 2011, p. 2–3, 9, 17–19; Compañía Minera del Pacífico S.A., 2011, p. 15, 50; Servicio Nacional de Geología y Minería, 2011, p. 41).

Despite an increase of about 24% in the average price of lead in 2010 compared with that of 2009, production of mined lead in Chile decreased by 54% during this timeframe. This was mostly owing to a labor strike at Breakwater Resources Ltd. of Canada's El Toqui Mine, which caused the company to modify the mining sequence to produce more gold and silver in concentrates and less lead and zinc in concentrates than initially planned for 2010. Molibdenos y Metales S.A. (MOLYMET) did not decrease production of rhenium much (if at all) in 2010, although a fire at the company's Nos plant in September 2009 had been expected to affect the company's future production of rhenium significantly. Information was not available concerning the reasons for the 23% decrease in the production of silver granules at the noble metals plant at CODELCO's Ventanas smelting and refining complex nor the 17.5% decrease in production of molybdenum oxides by the company's CODELCO Norte Division (table 1; Breakwater Resources Ltd., 2011, p. 1, 6, 21–23; Molibdenos y Metales S.A., 2011, p. 39, 51; Servicio Nacional de Geología y Minería, 2011, p. 31, 41, 59).

In 2010, production of clays (which included ball and plastic clays) and bentonite increased by 31% and about 29%, respectively, compared with that of 2009. Production of refractory or bauxitic clays decreased by 57% during the same timeframe, likely owing to a decrease in domestic demand for refractory materials (bricks) made from bauxitic clays for use in the production of crude steel. After producing only slightly more than 1,000 t of phosphorite in 2009, Compañía Minera de Fosfatos Naturales Ltda. increased production to substantially more than 40,000 t of phosphorite in 2010. Information concerning a reason for the company's increase in phosphorite production was not available, however, and neither was information available to explain why Chile's production of guano and apatite decreased by about 49% and 15%, respectively, during the same timeframe (table 1; Servicio Nacional de Geología y Minería, 2010, p. 85–90, 119–121, 152–153; 2011, p. 65–70; 99–101, 132–133).

Chile's total production of potash (K_2O equivalent) increased by about 40% compared with that of 2009 mostly owing to Sociedad Química y Minera de Chile S.A. (SQM)'s continued expansion of the company's production of potassium-based products in the Salar de Atacama. As part of SQM's expansion of potassium chloride (KCl) production capacity in 2009, SQM converted the company's potassium sulfate (K_2SO_4) production facilities to be of dual-use, with a capacity to produce more KCl in exchange for producing less K_2SO_4. In 2010, the company used this new flexibility to produce more KCl and less K_2SO_4, and this decision was primarily responsible for the precipitous decrease in Chile's production of potassium sulfate compared with that of 2009. In 2010, SQM increased its production of lithium carbonate to about 26,000 t compared with about 14,000 t in 2009 owing to the company's expectation of an increase in global demand (mostly based upon an expected increase in demand for lithium for use in rechargeable batteries). The other major producer of lithium products from the brines of the Salar de Atacama appeared to have increased production of lithium carbonate by about 7,000 t during this same timeframe (tables 1, 2; Sociedad Química y Minera de Chile S.A., 2010, p. 15, 17-18, 23, 31-32; 2011, p. 5, 15–17, 24, 27, 29–31, 34–35, 45).

Structure of the Mineral Industry

In 2010, many of the world's leading private mining companies were deeply invested in the mining sector of Chile. These companies included Anglo American plc and Antofagasta plc of the United Kingdom, Barrick Gold Corp. and Teck Cominco Ltd. of Canada, BHP Billiton Ltd. and BHP Billiton plc of Australia and the United Kingdom (BHP Billiton), Freeport-McMoRan Copper & Gold Inc. of the United States, K+S Aktiengesellschaft (K+S AG) of Germany, Rio Tinto Ltd. and Rio Tinto plc of Australia and the United Kingdom (Rio Tinto), and Xstrata plc of Switzerland (table 2).

The leading Chilean-owned companies in the mineral industry were CAP, CODELCO, MOLYMET, and SQM; CAP, MOLYMET and SQM were privately owned. CAP controlled most of the production of ferrous metals in the country; state-owned CODELCO was the leading copper mining company in the world; SQM was reportedly the leading integrated producer of iodine, lithium carbonate, and natural potassium nitrate in the world; and MOLYMET was the world's leading producer of rhenium (table 2; CAP S.A., 2011, p. 6–9, 51–52; Corporación Nacional del Cobre, 2011, p. 24; Molibdenos y Metales S.A., 2011, p. 9–10, 37, 85; Sociedad Química y Minera de Chile S.A., 2011, p. 17–20, 24–26).

Commodity Review

Metals

Copper.—BHP Billiton reported that the Escondida Mine would be able to produce at a rate of about 1.3 million metric tons per year (Mt/yr) of fine copper by sometime during the second half of 2014 or the first half of 2015 compared with the slightly less than 1.1 million metric tons (Mt) produced in 2010. BHP Billiton also reported that Minera Escondida Ltda. (which was 57.5% owned by BHP Billiton) planned to complete a crusher and conveyor system relocation project to access higher grade ore at the Escondida Mine by the end of 2012. This expansion, combined with completion of a debottlenecking project to provide additional copper ore processing capacity at the Laguna Seca concentration plant, could enable increased production of copper in concentrates at Escondida by the end of 2013 or sometime in 2014. Anglo American expected to increase the production capacity at Los Bronces Mine to about 400,000 metric tons per year (t/yr) of copper in concentrates by 2012 compared with an estimated 250,000 t/yr in 2010. Antofagasta projected that its new Esperanza Mine could produce about 160,000 t of payable copper in 2012 and possibly up to about 180,000 t of copper in 2013 (table 2; Anglo American plc, 2011, p. 18–19; BHP Billiton Ltd., 2011, p. 37–39, 43, 68, 135, 143, 153, 234; Antofagasta plc, 2012; Bourke, 2012).

In 2010, CODELCO approved construction of the Ministro Hales Mine near the Chuquicamata Mine in northern Chile and projected that construction would be completed by the end of 2013 and that mining could begin by sometime in 2014. The new mine was expected to eventually be able to produce about 160,000 t/yr of copper and about 300 t/yr of silver. During 2010, the company also continued with a feasibility study of converting the Chuquicamata Mine to an underground mining operation. A definitive timeline for beginning of construction of the new underground mine was not available, but the current open pit operation could stop being profitable sometime before 2020. After the conversion to an underground operation, the company estimated that the Chuquicamata Mine could produce about 340,000 t/yr of copper and 18,000 t/yr of molybdenum (Corporación Nacional del Cobre, 2011, p. 41–46; Vidal, 2011, p. 5).

Iron Ore and Manganese.—After decreasing production of iron ore in response to decreased demand both domestically and globally in 2009, CMP was able to increase production and exports of iron ore as the average price of all of the company's products more than doubled in 2010 compared with that of 2009. CMP expected that MASA would be able to fill any outstanding orders from stockpiles through 2011 (table 1; CAP S.A., 2011, p. 2–3, 9, 17–19; Compañía Minera del Pacífico S.A., 2011, p. 15, 50; Servicio Nacional de Geología y Minería, 2011, p. 41).

Industrial Minerals

Lithium and Potash.—Chile's globally significant production of industrial minerals was highly dependent on the mining of the brine deposits and caliche ores contained in the salars and arid areas, respectively, in the northern part of the country. In 2010, SQM reportedly increased its production of potash based mostly on expectations that prices for potassium-based fertilizers would consolidate at higher levels in 2010 or 2011 after resolution of issues with the completion of supply contracts between the world's major producers and significant consumers (especially in China). The brines of the Salar de Atacama were reported to contain significant concentrations of lithium as well as potassium, and SQM and one other company accounted for almost all (if not all) of the production of lithium carbonate from those brines (tables 1, 2; Sociedad Química y Minera de Chile S.A., 2011, p. 5, 15–17, 24, 27, 29–31, 34–35, 45).

Outlook

In a mining survey conducted by Business News Americas Ltda. between October and early December 2011, 45% of survey respondents said that Chile had the best investment climate in Latin America for mining investment. The Fraser Institute's ranking of Chile as a desirable destination for investment by private companies in the mining and quarrying sector was 8th out of 79 jurisdictions worldwide in 2011 compared with 7th out of 72 jurisdictions in 2010. Chile was the only jurisdiction outside of North America that consistently ranked among the top 10 for mining investment in the Fraser Institute's mining survey. Uncertainty owing to labor negotiations, changing tax regimes, uncertainty in output prices, accidents, equipment failures, or even natural hazard incidents (such as earthquakes) is ever present and could affect many of the projected timelines for mining projects or companies' production plans at existing mineral production facilities. Especially for new mining projects that do not yet have a completed feasibility study or do not expect to begin production until 4 to 5 years after an announced timeline, uncertainty can lead to delays in the actual start of production until years after the initially announced startup date (McMahon and Cervantes, 2011, p. 6, 9, 12; Vidal, 2011, p. 3–9; Business News Americas Ltda., 2012).

According to preliminary figures for 2011, it has been estimated that production of cement could have increased to 4.4 Mt; mined gold, to 45 t; iodine, to about 17,500 t; lithium carbonate, to about 55,000 t; molybdenum, to 42,000 t; potash, to about 1.6 Mt (of combined production of potassium chloride and potassium sulfate); and mined silver, to about 1,300 t compared with production in 2010. Production of boron compounds could have decreased to an estimated 480,000 t; mined copper, to about 5.25 Mt; and rhenium, to an estimated 24,000 kilograms compared with production in 2010. Chile's production of mined copper could increase to about 5.6 Mt in 2012 (mostly owing to the expansion at Los Bronces Mine and continued ramping up of production at the Esperanza Mine), 5.7 Mt in 2013 (mostly owing to the continued ramping up of production at ongoing expansions of existing mines and newer mines), and possibly about 5.9 Mt in 2014 (mostly owing to the completion of expansions at the Escondida Mine, and assuming that production at existing mines does not decrease substantially during the next 2 years) (Sociedad Química y Minera de Chile S.A., 2011, p. 5, 15–17, 24, 27, 29–31, 34–35, 45; Vidal, 2011, p. 10–16; Garay and others, 2012, p. 11).

Production of lithium, molybdenum, and potash could increase a bit more above projected 2011 levels, but further increases would probably only be incremental until definitive timelines are established for more major expansion projects or new mines to produce these minerals. Current Chilean law reportedly limits production of lithium in the Salar de Atacama by Sociedad Chilena del Litio Ltda. to no more than 200,000 t/yr of Li content and by SQM Salar S.A. to no more than 180,000 t/yr of lithium (owing to a classification of lithium as a strategic mineral in Chile), but neither company appears likely to approach either of these legal production limits in the next few years. In 2012 and beyond, production of rhenium could remain at about 24,000 kilograms per year or less because MOLYMET expected that its rhenium production levels could be limited by decreasing rhenium content in the (molybdenum) concentrates that the company processes (Azzopardi, 2010; Moores, 2010).

References Cited

Anglo American plc, 2011, Annual report 2010: London, United Kingdom, Anglo American plc, February 18, 208 p.
Angulo, M.A., 2011a, Boron: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 32–33.
Angulo, M.A., 2011b, Iodine: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 76–77.
Antofagasta plc, 2012, Quarterly production report—Q4 2011: London, United Kingdom, Antofagasta plc, February 1, 8 p.
Apodaca, L.E., 2011, Sulfur: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 158–159.
Azzopardi, Tom, 2010, Chile's MOLYMET sees rhenium output cut on fall in grade content: Platts Metals Week, November 10. (Accessed January 24, 2012, at http://www.platts.com/RSSFeedDetailedNews/RSSFeed/Metals/6589901.)
Banco Central de Chile, 2011a, Cuentas nacionales de Chile—2003-2010: Santiago, Chile, Banco Central de Chile, April, 153 p.
Banco Central de Chile, 2011b, Indicadores de comercio exterior—Cuarto trimestre de 2010: Santiago, Chile, Banco Central de Chile, February, 269 p.
BHP Billiton Ltd., 2011, Annual report on Form 40-F for the fiscal year ended June 31, 2011: Melbourne, Victoria, Australia, BHP Billiton Ltd., September 21, 275 p.
Biblioteca del Congreso Nacional de Chile, 2008, Decreto 95—Modifica Reglamento del Sistema de Evaluación de Impacto Ambiental: Biblioteca del Congreso Nacional de Chile, November 29. (Accessed March 26, 2012, at http://www.leychile.cl/Navegar?idNorma=205385&idParte=8140862&idVersion=.)
Bourke, Greta, 2012, Escondida to produce over 1.3 Mt/y copper by 2015—BHP Billiton CEO—Chile: Santiago, Chile, Business News Americas Ltda., February 8, 2 p.
Breakwater Resources Ltd., 2011, 2010 financial report: Toronto, Ontario, Canada, Breakwater Resources Ltd., February 24, 70 p.
Brooks, W.E., 2011a, Arsenic: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 20–21.
Brooks, W.E., 2011b, Silver: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 146–147.
Business News Americas Ltda., 2010, CAP's Huachipato severely damaged by earthquake; Gerdau, Amerigo ops halted—Chile: Santiago, Chile, Business News Americas Ltda., March 1, 1 p.
Business News Americas Ltda., 2012, Executive summary—Survey 2012—Results and analysis: Santiago, Chile, Business News Americas Ltda. Mining Intelligence Series, January, 2 p.
CAP S.A., 2011, Annual operations summary 2010: Santiago, Chile, CAP S.A., February 23, 65 p.
Comisión Chilena del Cobre, 2011, Anuario de estadísticas del cobre y otros minerales 1991-2010: Santiago, Chile, Comisión Chilena del Cobre, June, 168 p.
Compañía Minera del Pacífico S.A., 2011, Consolidated financial statements for the years ended December 31, 2010 and 2009 and independent auditor's report: La Serena, Chile, Compañía Minera del Pacífico S.A., February 23, 85 p.
Corporación Nacional del Cobre, 2011, Annual report 2010: Santiago, Chile, Corporación Nacional del Cobre, March 31, 229 p.
Crangle, R.D., Jr., 2011a, Diatomite: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 52–53.
Crangle, R.D., Jr., 2011b, Pumice and pumicite: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 124–125.
Economist, The, 2010a, Chile's copper industry—Reviving Codelco: The Economist, v. 397, no. 8705, October 23, p. 44.
Economist, The, 2010b, Rebuilding Chile—Taxing times: The Economist, v. 395, no. 8679, April 24, p. 36.
Edelstein, D.L., 2011, Copper: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 48–49.
Garay, V., Schwarz, S., and Donoso, F., 2012, Informe tendencias mercado del cobre—Balance 2011 y perspectivas 2012-2013: Santiago, Chile, Comisión Chilena del Cobre, January, 21 p.

George, M.W., 2011a, Gold: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 66–67.
George, M.W., 2011b, Selenium: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 142–143.
Henriquez, Victor, 2010, Govt to present royalty bill to congress within 10 days—Chile: Santiago, Chile, Business News Americas Ltda., August 13, 1 p.
International Monetary Fund, 2009, Chile: 2009 Article IV Consultation—Staff report; Staff statement and supplement; Public information notice on the Executive Board discussion; and statement by the Executive Director for Chile: International Monetary Fund Country Report no. 09/271, September 9, 63 p.
International Monetary Fund, 2011, Chile, *in* World economic outlook database: International Monetary Fund, September. (Accessed February 8, 2012, via http://www.imf.org/external/pubs/ft/weo/2011/02/index.htm.)
Jasinski, S.M., 2011, Potash: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 122–123.
Jaskula, B.W., 2011, Lithium: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 94–95.
Kostick, D.S., 2011, Salt: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 134–135.
Kumhof, Michael, and Laxton, Douglas, 2009, Chile's structural fiscal surplus rule—A model-based evaluation: International Monetary Fund Working Paper no. 09/88, April 1, 54 p.
McMahon, Fred, and Cervantes, Miguel, 2011, Fraser Institute annual survey of mining companies—2010/2011: Vancouver, British Columbia, Canada, The Fraser Institute, March 3, 98 p.
Metals Economics Group, 2010, Chile, *in* MineSearch database: Halifax, Nova Scotia, Canada, Metals Economics Group. (Accessed October 12, 2010, via http://www.metalseconomics.com/.)
Ministerio de Hacienda, 2011, Informe anual de los fondos soberanos 2010: Santiago, Chile, Ministerio de Hacienda, June, 91 p.
Molibdenos y Metales S.A., 2011, Memoria anual 2010: Santiago, Chile, Molibdenos y Metales S.A., March 8, 217 p.
Moores, Simon, 2010, Argentina aims for Chile's lithium rank: Industrial Minerals, no. 519, November, p. 22–24.
Polyak, D.E., 2011a, Molybdenum: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 106–107.
Polyak, D.E., 2011b, Rhenium: U.S. Geological Survey Mineral Commodity Summaries 2011, p. 130–131.
Rojas, V.d.P., Figueroa, G.M., Calderón, C.M., and Santos, L.V., 2006, Impuesto específico a la actividad minera—Características y principales implicancias, *in* Dirección de Estudios, Comisión Chilena del Cobre, 2006, Estudios e investigaciones: Santiago, Chile, Comisión Chilena del Cobre, p. 345–373.
Servicio Nacional de Geología y Minería, 2010, Anuario de la minería de Chile, 2009: Santiago, Chile, Servicio Nacional de Geología y Minería, 227 p.
Servicio Nacional de Geología y Minería, 2011, Anuario de la minería de Chile, 2010: Santiago, Chile, Servicio Nacional de Geología y Minería, 211 p.
Singer, D.A., Berger, V.I., and Moring, B.C., 2005, Porphyry copper deposits of the world—Database, map, and grade and tonnage models: U.S. Geological Survey Open-File Report 2005-1060, ver. 1. (Accessed January 14, 2008, at http://pubs.usgs.gov/of/2005/1060/.)
Sociedad Química y Minera de Chile S.A., 2010, Annual report on Form 20-F for the fiscal year ended December 31, 2009: Santiago, Chile, Sociedad Química y Minera de Chile S.A., June 30, 108 p.
Sociedad Química y Minera de Chile S.A., 2011, Annual report on Form 20-F for the fiscal year ended December 31, 2010: Santiago, Chile, Sociedad Química y Minera de Chile S.A., June 30, 113 p.
Vidal, V.P., 2011, Inversión en la minería Chilena—Cartera de proyectos: Santiago, Chile, Dirección de Estudios y Políticas Públicas, Comisión Chilena del Cobre, July, 34 p.

TABLE 1
CHILE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
METALS						
Arsenic trioxide[e, 3]		11,000	11,000	10,000	11,000	11,000
Copper:						
Mine output, Cu content[4]	thousand metric tons	5,361	5,557	5,328	5,394 [r]	5,419
Metal:						
Smelter, primary	do.	1,565	1,514	1,369	1,522	1,560
Refined:						
Electrowon	do.	1,692	1,832	1,971	2,118 [r]	2,089
Primary, other	do.	1,119	1,105	1,087	1,159	1,155
Total	do.	2,811	2,937	3,058	3,277 [r]	3,244
Gold, mine output, Au content	kilograms	42,100	41,527	39,162	40,834	39,494
Iron and steel:						
Ore and concentrate:						
Gross weight	thousand metric tons	8,628	8,818	9,316	8,242	9,130
Fe content	do.	5,235	5,379	5,670	5,006	5,852
Metal:						
Pig iron	do.	1,115	1,147	1,109 [r]	923 [r]	635
Ferroalloys:[e, 5]						
Ferrochromium		84	193	54	11	--
Ferromolybdenum		14,000	14,800	16,900	10,800	12,500
Steel, crude	thousand metric tons	1,627	1,679	1,523	1,308 [r]	1,011
Semimanufactures	do.	1,520	1,607	1,573	1,286 [r]	896
Lead, mine output, Pb content		672	1,305	3,985	1,511	695
Manganese ore and concentrate:						
Gross weight		37,169	26,808	18,273	5,722	--
Mn content		9,771	7,287	5,096	1,642	--
Molybdenum, mine output, Mo content		43,278	44,912	33,687	34,925	37,186
Of which, oxides[6]		7,197	7,244	5,662	7,134	5,885
Rhenium, mine output, Re content[e, 7]	kilograms	19,800	22,900	27,600	25,000	25,000
Selenium[e]	do.	74,000	70,000	78,000	90,000	90,000
Silver:						
Mine output, Ag content		1,607	1,936	1,405	1,301	1,287
Metal, Ag content[8]	kilograms	150,952	141,071	161,992	195,375	150,060
Zinc, mine output, Zn content		36,238	36,453	40,519	27,801	27,662
INDUSTRIAL MINERALS						
Barite		375	77	--	--	--
Boron compounds:						
Boric acid (H_3BO_3)		8,446	7,143	7,525	5,214	--
Ulexite, natural		459,645	527,929	583,474	607,921	503,609
Total		468,091	535,072	590,999	613,135	503,609
Cement, hydraulic	thousand metric tons	4,112	4,440	4,622	3,876	3,871
Clays:						
Bentonite		--	533	--	--	--
Kaolin		44,642	87,901	63,526	48,354	62,226
Refractory (bauxitic)		34,594	24,434	60,022	69,634	29,832
Other, including ball and plastic clays		84,846	97,189	23,197	6,076	7,972
Total		164,082	210,057	146,745	124,064	100,030
Copper sulfate		5,124	10,217	12,971	11,860	12,023
Diatomite		19,104	25,405	25,497	23,027	30,925
Dolomite		24,006	13,791	14,263	--	--
Feldspar		5,847	6,704	17,834	9,079	7,723
Gypsum:						
Crude	thousand metric tons	845	773	774	724	758
Calcined	do.	197	200	197	196	184
Iodine, elemental		16,494	15,473	15,503	17,399	15,793
Lime, hydraulic[e]	thousand metric tons	820	840	820	790	790

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
INDUSTRIAL MINERALS—Continued						
Lithium compounds, natural:						
Lithium carbonate		46,241	51,292	48,469	25,154	44,025
Lithium chloride		1,166	4,185	4,362	2,397	3,725
Lithium hydroxide		3,794	4,160	4,050	2,987	5,101
Nitrates, crude, natural	thousand metric tons	1,112	1,160	1,158	1,049	1,059
Phosphatic materials, natural:						
Phosphate rock (apatite):						
Gross weight		12,236	12,910	21,306	10,584	9,019
P_2O_5 content[e]		3,770	3,980	6,570	3,260	2,780
Phosphorite		1,600	12,163	16,988	1,059	40,664
Guano		--	--	2,892	1,649	845
Potash, natural:						
Potassium chloride, KCl		647,449	690,692	753,995	942,309	1,523,222
Of which, K_2O equivalent[9]		409,000	436,300	476,300	595,300	962,200
Potassium sulfate, K_2SO_4		170,406	155,853	163,096	188,643	2,774
Of which, K_2O equivalent[e,10]		87,000	79,000	83,000	96,000	1,400
Pumicite	thousand metric tons	1,423	1,136	1,063	919	824
Pyrophyllite		1,257	1,340	1,147	412	1,126
Salt (NaCl)	thousand metric tons	4,580	4,404	6,431	8,382	7,695
Siliceous sand and gravel (silica):						
Quartz, unspecified	do.	444	520	536	601	502
Silica sand	do.	638	713	865	803	825
Total	do.	1,081	1,234	1,401	1,405	1,326
Sodium compounds, n.e.s., sulfate[11, 12]		100 [e]	100 [e]	128	112	60
Stone:						
Limestone, calcium carbonate	thousand metric tons	7,145	7,196	7,295	6,012	6,518
Of which:						
Coquina	do.	330	392	420	297	329
Ground calcium carbonate, white	do.	16	15	34	46	48
Lapis lazuli		400	72	5	215	--
Marble		169	204	187	1,582	2,170
Travertine		12,020	14,805	11,413	5,473	4,015
Sulfur, byproduct[13]	thousand metric tons	1,641	1,559 [r]	1,573	1,653 [r]	1,676
Talc		704	764	961	790	238
Zeolites		298 [r]	280 [r]	140 [r]	--	--
MINERAL FUELS AND RELATED MATERIALS						
Coal, bituminous and lignite, marketable	thousand metric tons	674	288	534	636	619
Coke, coke oven[e]	do.	560	580	520	450	350
Methanol	do.	3,186	1,841	1,088	942	935
Natural gas liquids:[e]						
Natural gasoline	thousand 42-gallon barrels	NA [r]	NA [r]	NA [r]	NA [r]	NA
Liquefied natural gas	do.	-- [r]	-- [r]	-- [r]	-- [r]	--
Total	do.	NA [r]	NA [r]	NA [r]	NA [r]	NA
Natural gas, marketable	million cubic meters	2,199	2,015	1,828	1,889	1,793
Petroleum:						
Crude and condensate[14]	thousand 42-gallon barrels	1,061	931	966	1,355	1,536
Refinery products:[15]						
Liquefied petroleum gas	do.	8,623	8,246	7,674	8,560	7,787
Gasoline, including for aviation	do.	21,668	18,725	21,687	21,121	17,549
Kerosene, including for jet fuel	do.	5,548	4,862	4,573	5,271	4,994
Diesel and distillate fuel oil	do.	25,600	24,040	27,549	25,751	21,738
Residual fuel oil	do.	17,523	16,310	12,756	11,177	9,202
Other, including asphalt, ethylene, naphtha, propylene, solvents, and so forth	do.	9,108	10,032	8,334	7,875	5,862
Total	do.	88,070	82,215	82,573	79,755	67,131

See footnotes at end of table.

TABLE 1—Continued

CHILE: PRODUCTION OF MINERAL COMMODITIES[1]

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. NA Not available. -- Zero.

[1]Table includes data available through January 27, 2012.

[2]In addition to the commodities listed, pyrite is also produced, but available information is inadequate to make reliable estimates of output.

[3]Estimated arsenic trioxide equivalent of possible arsenic-containing residues and smelter dusts that might be recovered from nonferrous metals plants in Chile, although these residual materials may not have been processed to recover commercial-grade arsenic trioxide.

[4]Figures are the nonduplicate copper content of ore concentrates, blister, and refined copper measured at the last stage of commercial production, as reported by Comisión Chilena del Cobre (COCHILCO). Mine production reported by Servicio Nacional de Geología y Minería (SERNAGEOMIN) for the same years was only slightly higher (0.01% to 0.95%).

[5]Estimated from reported net exports.

[6]Production of molybdenum oxide only from the CODELCO Norte Division of Corporación Nacional del Cobre de Chile (CODELCO).

[7]Rhenium content of mine output in Chile was estimated based on information from COCHILCO.

[8]Production of refined silver metal (granular) only from the Ventanas smelter and refinery.

[9]Based on 63.17% potassium oxide equivalent for potassium chloride (sylvite) in Chile, as reported by SERNAGEOMIN, and rounded to four significant digits.

[10]Based on an assumed 51% potassium oxide equivalent for potassium sulfate, according to a minimum global average estimate and rounded to two significant digits. Source: Jasinski, S.M., 2011, Potash, *in* Metals and minerals: U.S. Geological Survey Minerals Yearbook 2009, v. I, p. 58.1–58.9.

[11]Not elsewhere specified.

[12]Includes production of natural sodium sulfate and anhydrous sodium sulfate, which are coproducts of the nitrate industry (salitre).

[13]Sulfur content of sulfuric acid as a byproduct of metallurgy and processing of mineral fuels, as reported by COCHILCO.

[14]Includes natural gasoline.

[15]Includes production from both imported and domestic petroleum, as reported by Empresa Nacional del Petróleo (ENAP).

TABLE 2
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Barite	metric tons	Sociedad Minera Godoy Schwenger y Cía.	La Calera, Region V	400
Bentonite	do.	Sociedad Legal Minera Mabel Dos Primera de Arica	Quarry and plant near Arica, Region XV	1,500
Boron compounds, B_2O_3 content		Química Industrial del Bórax Ltda. (private, Chile-based investors, 100%)	Ulexite mine at Salar del Surire; and boric acid and agrochemical plants near Arica, Region XV	550
Do.		S.Q.M. Boratos S.C.M. [Sociedad Química y Minera de Chile S.A. (SQM), 100%]	Mine brines of Atacama Salar, and boric acid plant at Antofagasta, Region II	200
Do.		S.Q.M. Salar S.A. [Sociedad Química y Minera de Chile S.A. (SQM), 100%]	Plant in Santiago Metropolitan Region	NA
Calcium carbonate, natural		Minera El Way S.A. (Cementos Bío Bío S.A., 100%)	Quarry near Antofagasta, Region II	NA
Do.		Minera El Jilguero S.A. (Cementos Bío Bío S.A., 100%)	Quarry near Copiapo, Region III	NA
Do.		Minera Río Teno S.A. (Cementos Bío Bío S.A., 100%)	Quarry and plant at Teno, near Curico, Region VII	NA
Do.		Minera Río Colorado S.A (Cementos Bío Bío S.A., 51%, and Soprocal Calerías e Industrias S.A., 49%)	La Perla Mine and plant near Melipilla, Santiago Metropolitan Region	NA
Do.		Sociedad Minera Las Abuelitas Ltda. (Soprocal Calerías e Industrias S.A., 100%)	Mine and plant near Melipilla, Santiago Metropolitan Region	NA
Do.		Minera Melón S.A. (Melón S.A., 100%)	Navío Mine near Quillota, Region V	NA
Do.		Alfredo Villalobos Román Tarsicio S.A.	Quarry and plant near Illapel, Region IV	NA
Do.		César B. Formas Ortiz S.A.	Plant at Chañaral, Region III	NA
Do.		Explotaciones de Minas Tongoy Ltda.	Quarry and plant near Tongoy, Region IV	NA
Do.		Imopac Ltda.	Plant at Vallenar, Region III	NA
Do.		Mario Alberto Pizarro A. S.A.	Plant at Los Vilos, Region IV	NA
Do.		Minera Trucco Ltda.	Mine and plant, Santiago Metropolitan Region	NA
Do.		Cristalerías Toro S.A.I.C.	Plant at Santiago, Santiago Metropolitan Region	NA
Do.		Sociedad Minera Godoy Schwenger y Cía.	Mine and plant near Quillota, Region V	NA
Do.		Compañía Minera Feltre Ltda.	Plant at Santiago, Santiago Metropolitan Region	NA
Do.		Compañía Minera Saturno Ltda.	do.	NA
Do.		Unimin Chile Ltda.	do.	NA
Do.		Sociedad Minera y Comercial Alegría y Cia Ltda.	Mine and plant at Coquimbo, Region IV	NA
Do.		Sociedad Contractual Minera Pirineos	Quarry and plant at Vallenar, Region III	NA
Do.		Cemento Polpaico S.A. (Holcim Ltd., 54.3%; Compañía de Consumidores de Gas de Santiago, 40.9%; other, 4.8%)	Cerro Blanco plant, Santiago Metropolitan Region; Mejillones plant, Region II; Coronel plant, Region VIII	NA
Cement		do.	do.	2,700 [1]
Do.		Melón S.A. (Inversiones Brescia S.A., 99.24%, and other private, 0.76%)	La Calera plant, Region V, and grinding plant at Puerto Montt, Region X	1,800 [1]
Do.		Cementos Bío Bío S.A. (private, 100%)	Talcahuano Plant, Region VIII	750 [1]
Do.		do.	Grinding plant at San Antonio, Region V	300 [1]
Do.		Industria Nacional de Cemento S.A. (INACESA), 100%	Plant near Antofagasta City, Region II	500 [1]
Do.		do.	Plant near Curico City, Region VII	1,700 [1]
Clays, unspecified		Sociedad Minera Casablanca S.A.	Quarry and plant in Santiago Metropolitan Region	NA
Do.		Sociedad Minera Godoy Schwenger y Cía.	Quarry and plant near Quillota, Region V	NA
Do.		Minera Lealtad Ltda.	Quarry and plant at Til Til, Santiago Metropolitan Region, and at Olmue, Region V	NA
Coal, bituminous and lignite		Empresa Nacional del Carbón S.A. (ENACAR)	Trongol Mine near Curanilahue, and plant at Lota, Region VIII	NA
Do.		Carbonífera Victoria de Lebu S.A. (Empresa Nacional del Carbón S.A., 100%)	La Fortuna de Lebu Mine near Lebu, Region VIII	150
Do.		Ingeniería del Sur S.A.	Bish Mine and possibly other active mines, Pecket deposit, Magallanes coal basin, Region XII	600
Copper, Cu content		Minera Escondida Ltda. (BHP Billiton plc, 57.5%; Rio Tinto plc, 30%; Japan Escondida Corp., 10%; International Finance Corp., 2.5%)	Escondida open pit mine, two concentrator plants, an oxide plant for cathode production (SX-EW[2]), and a sulfide-leach plant for cathode production, Region II	1,200
Do.		Minera Spence S.A. (BHP Billiton plc, 100%)	Spence Mine and SX-EW[2] plant, Region II	200 [1]
Do.		Compañía Minera Cerro Colorado (BHP Billiton plc, 100%)	Cerro Colorado Mine and SX-EW[2] plant, Region I	120 [1]

See footnotes at end of table.

TABLE 2—Continued
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Copper, Cu content—Continued	Compañía Minera Doña Inés de Collahuasi SCM (Anglo American plc, 44%; Xstrata plc, 44%; companies led by Mitsui & Co. Ltd., 12%)	Collahuasi open pit mine, concentration plant, and SX-EW[2] plant, at Ujina, Region I	590 [1]
Do.	Corporación Nacional del Cobre (CODELCO) (Government, 100%)	CODELCO Norte Division, including Chuquicamata, Mina Mina Sur, and Radomiro Tomic Mines; and Chuquicamata SX-EW[2] plant (oxide), smelter, and refinery (oxide and sulfide), and Radomiro Tomic SX-EW[2] plant, Region II	900
Do.	do.	El Teniente Division and Mine, and Caletones smelter (anodes) and refinery (fire-refined ingots), Region VI	430
Do.	do.	Ventanas Division, Las Ventanas smelter and refinery (cathodes), Region V	400
Do.	do.	Andina Division, including Rio Blanco and Sur Sur Mines (concentrates), Region V	210
Do.	do.	Salvador Division, including Campamento Antiguo and Damiana Norte open pit mines; Inca underground mine; and Potrerillos SX-EW[2] plant and refinery, Region III	80
Do.	Minera Gaby S.A. [Corporación Nacional del Cobre (CODELCO) (Government, 100%), 100%]	Gabriela Mistral Mine and SX-EW[2] plant, Sierra Gorda, Region II	150 [1]
Do.	Compañía Minera Los Pelambres S.A. (Antofagasta plc, 60%, and a Japanese consortia, 40%)	Los Pelambres open pit mine and concentration plant, Region IV	340
Do.	Minera El Tesoro S.A. (Antofagasta plc, 100%)	El Tesoro open pit mine and SX-EW[2] plant, Region II	100
Do.	Minera Michilla S.A. (Antofagasta plc, 74.2%, and other private Chilean investors, 25.8%)	Michilla Mine and SX-EW[2]/sulfide-leaching plant, Region II	45
Do.	Empresa Nacional de Minería (ENAMI) (Government, 100%)	Hernán Videla Lira smelter (anodes and blister), Paipote, Region III	340
Do.	do.	Concentration plants: Manuel Antonio Matta, Paipote; Osvaldo Martínez, El Salado; and Vallenar, Region III; and José Antonio Moreno, Taltal, Region II	180
Do.	Anglo American Sur S.A. (Anglo American plc, 100%)	Los Bronces Mine (concentrates) and Tortolas SX-EW[2] plant (cathodes), Santiago Metropolitan Region	250
Do.	do.	Chagres smelter (anodes and blister), Region V	175
Do.	do.	El Soldado Mine (concentrates), Region V	50
Do.	Empresa Minera de Mantos Blancos S.A. (Anglo American plc, 99.9%, and other private, 0.1%)	Mantos Blancos open pit mine and SX-EW[2] plant, Region II	100
Do.	do.	Mantoverde open pit mine and SX-EW[2] plant, Region III	65
Do.	Xstrata Copper Chile S.A.	Altonorte smelter (anodes and blister), La Negra, Region II	280 [1]
Do.	Compañía Minera Xstrata Lomas Bayas (Xstrata plc, 100%)	Lomas Bayas Mine and SX-EW[2] plant, Region II	75 [1]
Do.	Sociedad Contractual Minera El Abra [Freeport-McMoRan Copper & Gold Inc., 51%, and Corporación Nacional del Cobre (CODELCO) (Government, 100%), 49%]	El Abra Mine and SX-EW[2] plant, near Calama, Region II	225 [1]
Do.	Cía. Contractual Minera Candelaria (Freeport-McMoRan Copper & Gold Inc., 80%, and SMMA Candelaria Inc., 20%)	Candelaria open pit mine, underground mine, and concentration plant, near Copiapo, Region III	150
Do.	Cía. Contractual Minera Ojos del Salado (Freeport-McMoRan Copper & Gold Inc., 80%, and SMMA Candelaria Inc., 20%)	Ojos del Salado Mine and concentration plant, near Copiapo, Region III	35
Do.	Compañía Minera Zaldívar (Barrick Gold Corp., 100%)	Zaldívar open pit mine and SX-EW[2] plant, Region II	150
Do.	Compañía Minera Quebrada Blanca [Teck Cominco Ltd., 76.5%; Inversiones Mineras S.A., 13.5%; Empresa Nacional de Minería (ENAMI) (Government, 100%), 10%]	Quebrada Blanca open pit mine and SX-EW[2] plant, Region I	100

See footnotes at end of table.

TABLE 2—Continued
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Copper, Cu content—Continued		Compañía Minera Carmen de Andacollo [Teck Cominco Ltd., 90%, and Empresa Nacional de Minería (ENAMI) (Government, 100%), 10%]	Carmen de Andacollo Mine and SX-EW[2] plant, Region IV	22
Do.		Alliance Copper Ltd. (Codelco Technologies Ltd., 100%)	Plant to acid-leach fine copper at Chuquicamata, Region II (from residual material produced at CODELCO Norte and El Teniente Divisions)	20
Copper sulfate	metric tons	Compañía Minera Cerro Negro	Portales Mine and a plant at Cabildo, Region V	200
Do.	do.	Minera Capacho Viejo Ltda.	Mine and plant near Tocopilla, Region II	5,000
Do.	do.	Compañía Minera San Gerónimo	Mine and plant near Coquimbo, Region IV	10,000
Diatomite		Celite Chile Ltda. (IMERYS S.A., 100%)	Plant at Port of Arica, and mining operations nearby in Regions I and XV	30
Dolomite		Minera El Jilguero S.A. (Cementos Bío Bío S.A., 100%)	Quarries and plant near Copiapo, Region III	30
Feldspar		Minera Alfa Quintay Ltda.	Quarry and plant, Santiago Metropolitan Region	NA
Do.		J.B. Schiappacase A.	Quarry and plant near Limache, Region V	NA
Do.		Minera Pacífico Ltda.	Quarries and plants in Region VI, and plant in Santiago Metropolitan Region	NA
Ferromolybdenum		Molibdenos y Metales S.A. (MOLYMET) (private, 100%)	Nos plant, San Bernardo, 30 kilometers south of Santiago, Santiago Metropolitan Region	25
Gold:				
Metal ingots	kilograms	Corporación Nacional del Cobre (CODELCO) (Government, 100%)	Ventanas refinery, Region V	6,000
Mine output	do.	do.	Andina, CODELCO Norte, El Teniente, and Salvador Divisions (byproduct of copper production)	2,000
Do.	do.	Minera Escondida Ltda., 100%	Escondida copper mine and plants, Region II	4,500
Do.	do.	Cía. Contractual Minera Candelaria, 100%	Candelaria copper mine and plant, Region III	2,500
Do.	do.	Cía. Contractual Minera Ojos del Salado, 100%	Ojos del Salado copper mine and plant, Region III	600
Do.	do.	Compañía Minera Los Pelambres S.A., 100%	Los Pelambres Mine and plant, Region IV	1,200
Do.	do.	Empresa Nacional de Minería (ENAMI) (Government, 100%)	Manuel Antonio Matta plant, Paipote; Osvaldo Martínez plant, El Salado; and Vallenar plant, Region III; and José Antonio Moreno plant, Taltal, Region II	400
Do.	do.	Compañía Minera Doña Inés de Collahuasi SCM, 100%	Collahuasi Mine and plants, Region I	NA
Do.	do.	Compañía Minera Mantos de Oro (Kinross Gold Corp., 100%)	La Coipa Mine and plant, Region III, 140 kilometers north of Copiapo	7,400
Do.	do.	Compañía Minera Maricunga (Kinross Gold Corp., 100%)	Maricunga open pit, heap-leach mine, Region III, 100 kilometers east of Copiapo	7,500
Do.	do.	Cía. Minera Meridian S.A. (Yamana Gold Inc., 100%)	El Peñón Mine and concentration plant, Region II	7,000
Do.	do.	Minera Florida S.A. (Yamana Gold Inc., 100%)	Minera Florida Mine and concentration plant, Santiago Metropolitan Region	2,700
Do.	do.	Compañía Minera Cerro Bayo Ltda. (Mandalay Resources Corp., 100%)	Cerro Bayo Mine and concentration plant, Region XI	1,000
Do.	do.	Sociedad Contractual Minera El Toqui Ltda. (Breakwater Resources Ltd., 100%)	El Toqui Mine and Doña Rosa concentration plant, Region XI, 120 kilometers north of Coyhaique	1,500
Gypsum, natural		Compañía Industrial El Volcán S.A. (Saint-Gobain Gypsum S.A., 100%)	El Volcan quarry near Santiago, Santiago Metropolitan Region	100
Do.		Compañía Minera Romeral S.A. (Etex Group S.A., 59.8%, and Melón S.A., 40.2%)	El Romeral quarry near Santiago, Santiago Metropolitan Region	50
Do.		Minera Lo Valdés Ltda.	Santiago Metropolitan Region	NA
Do.		Compañía Minera Polpaico Ltda.	Yeso Norte Mine, Region II	NA
Do.		Industria Nacional de Cemento S.A. (INACESA), 100%	Mantos verdes quarry near Antofagasta City, Region II	NA
Do.		Antonio Zotti Rosetti y Cía. Sociedad Minera	La Confianza and San Jose Mines near Los Vilos, Region IV; Margarita and San Nicolas Mines, and a plant near Renca, Santiago Metropolitan Region	NA

See footnotes at end of table.

TABLE 2—Continued
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Iodine	metric tons	SQM Químicos S.A. [Sociedad Química y Minera de Chile S.A. (SQM), 100%]	Nueva Victoria Mine and plant and Iris Plant, Region I; El Toco Mine and María Elena plant; and Pampa Blanca and Pedro de Valdivia Mines and plants, Region II	11,000 [1]
Do.	do.	Sociedad Contractual Minera Cosayach (Inverraz S.A., 100%)	Mine and plant near Iquique, Region I	3,000
Do.	do.	Atacama Minerals Chile Sociedad Contractual Minera (Atacama Minerals Corp., 100%)	Mine and plant in Aguas Blancas, Region II	1,100
Do.	do.	ACF Minera S.A.	Lagunas mine and plant near Iquique, Region I	1,400
Iron ore		Compañía Minera del Pacífico S.A. (CMP), 100% (subsidiary of CAP S.A.)	Cristales and El Algarrobo Mines, El Algarrobito and Huasco concentration plants, and Huasco pellet plant, Region III; El Romeral and El Tofo Mines, and El Romeral concentration and pellet-feed plants, Region IV; and El Laco concentration plant, Region II	9,000
Do.		Sociedad Contractual Minera Vallenar Iron Company (Admiralty Resources NL, 100%)	Japonesa and Japonesita Mines, near Vallenar, Region III	2,000
Do.		Cía. Minera Huasco S.A. [Cía. Minera del Pacífico S.A. (CMP), 50%, and MC Inversiones Ltda., 50%]	Los Colorados Mine and concentration plant, Region III	NA
Kaolin		Compañía Minera Polpaico Ltda.	El Guindo Mine and a plant in the Santiago Metropolitan Region	NA
Do.		Minera Lealtad Ltda.	Mine and plant at Til Til, Santiago Metropolitan Region	NA
Do.	metric tons	Mario Alberto Pizarro A.S.A.	Plant at Los Vilos, Region IV	600
Lapis lazuli	do.	Las Flores de los Andes S.A.	Mine near Ovalle, Region IV	400
Lead, mine output	do.	Minera Florida S.A. (Yamana Gold Inc., 100%)	Minera Florida Mine and concentration plant, Santiago Metropolitan Region	NA
Do.	do.	Sociedad Contractual Minera El Toqui Ltda. (Breakwater Resources Ltd., 100%)	El Toqui Mine and Doña Rosa concentration plant, Region XI, 120 kilometers north of Coyhaique	3,000
Lime, hydraulic		Industria Nacional de Cemento S.A. (INACESA) (Cementos Bío Bío S.A., 100%)	Plants near Antofagasta City, Region II, and near Copiapo City, Region III	880 [1]
Do.		Soprocal Calerías e Industrias S.A.	Plant at Melipilla, Santiago Metropolitan Region	165
Lithium carbonate	metric tons	Sociedad Chilena del Litio Ltda. (subsidiary of Chemetall GmbH, owned by Rockwood Holdings Inc., 100%)	Chemetalle Foote plant at La Negra, near the city of Antofagasta, Region II	26,000
Do.	do.	SQM Salar S.A. [subsidiary of Sociedad Química y Minera de Chile S.A. (SQM)] (private, 100%)	Plant at Salar del Carmen, near the city of Antofagasta, Region II	43,500 [1]
Lithium chloride	do.	do.	do.	NA
Lithium hydroxide	do.	do.	do.	6,000 [1]
Manganese	do.	Manganesos Atacama S.A. (subsidiary of CAP S.A.)	Plant in Coquimbo city and mines in Region IV[3]	10,000
Marble, dimension stone	do.	Pier Luigi Indri S.A.	Quarry at Cerrillos, Region III	250
Do.	do.	Compañía Minera Feltre Ltda.	Quarry and plant in Region III	1,400
Molybdenum, mine output	do.	Anglo American Sur S.A., 100%	Los Bronces Mine and Tortolas molybdenum flotation plant, Santiago Metropolitan Region	3,000
Do.	do.	Corporación Nacional del Cobre (CODELCO) (Government, 100%)	CODELCO Norte Division, Region II	20,000
Do.	do.	do.	El Teniente Mine and plant, Region VI	5,500
Do.	do.	do.	Andina Division, Region III	2,500
Do.	do.	do.	El Salvador Division, Region III	1,500
Do.	do.	Compañía Minera Los Pelambres S.A., 100%	Los Pelambres Mine and plant, Region IV	8,500
Do.	do.	Compañía Minera Doña Inés de Collahuasi SCM, 100%	Collahuasi Mine and molybdenum plant, Region I	4,000
Molybdenum oxide, Mo content	do.	Molibdenos y Metales S.A. (MOLYMET) (private, 100%)	Nos plant, San Bernardo, 30 kilometers south of Santiago, Santiago Metropolitan Region	45,000
Do.	do.	do.	Molynor plant, Mejillones, Region II	15,000
Do.	do.	Corporación Nacional del Cobre (CODELCO) (Government, 100%)	CODELCO Norte Division, Region II	7,500
Natural gas	million cubic meters	Empresa Nacional del Petróleo S.A. (ENAP) (Government, 100%)	About 23 oilfields, including Costa Auera, in the Magallanes basin, Region XII	2,200
Do.	do.	GeoPark Chile Ltd. (operator) (GeoPark Holdings Ltd., 100%)	Oilfields and gasfields and the Kimiri Aike natural gas plant on the Fell block, Magellan or Austral Basin, Region XII	380

See footnotes at end of table.

TABLE 2—Continued
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Nitrates:				
Primarily sodium nitrate		SQM Nitratos S.A. [subsidiary of Sociedad Química y Minera de Chile S.A. (SQM)] (private, 100%)	El Toco Mine and Maria Elena plant; Pampa Blanca and Pedro de Valdivia Mines and plants; and Coya Sur plant, Region II	770 [1]
Primarily potassium nitrate		do.	do.	650 [1]
In fertilizer		Cosayach Nitratos S.A. (Inverraz S.A., 100%)	Mine and plant near Iquique, Region I	200
Do.		SQM Industrial S.A.	Mine and plant near Santiago, Region II	100
Do.		ACF Minera S.A.	Lagunas Mine and plant near Iquique, Region I	NA
Petroleum	thousand 42-gallon barrels	Empresa Nacional del Petróleo S.A. (ENAP) (Government, 100%)	About 23 oilfields, including Costa Auera, in the Magallanes basin, Region XII	6,500
Do.	do.	GeoPark Chile Ltd. (operator) (GeoPark Holdings Ltd., 100%)	Oil and gas fields in the Fell block, Magellan or Austral Basin, Region XII	800
Petroleum refinery products	do.	Empresa Nacional del Petróleo S.A. (ENAP) (Government, 100%)	Aconcagua, Bio Bio, and Gregorio refineries	90,000
Phosphatic materials, natural:				
Guano		Guano Rojo Punta Gruesa Ltda.	Mine and plant near Iquique, Region I	3
Phosphate rock, apatite		César B. Formas Ortiz S.A.	Mine near Chanaral, Region II	20
Do.		Compañía Minera El Sauce Ltda.	Mine near La Serena, Region IV	5
Phosphorite		Compañía Minera de Fosfatos Naturales Ltda. (Bifox Ltda.) (TEHMCORP S.A., 100%)	Mines at and around Bahia Inglesa; Osorno plant near Bahia Inglesa, Region III; and Bahia Inglesa plant at Caldera, Region IV	45
Do.		Sociedad Contractual Minera Bahía Inglesa	Selaqueos Mine near Bahia Inglesa, Region III	NA
Pig iron		Cía. Siderúrgica Huachipato S.A. (subsidiary of CAP S.A.) (private, 100%)	Plant in Bahia de San Vicente, Region VIII, 14 kilometers northeast of Concepcion	1,200
Potash (KCl and K_2SO_4), K_2O content		SQM Salar S.A. [subsidiary of Sociedad Química y Minera de Chile S.A. (SQM)] (private, 100%)	Plant at Salar del Carmen, near the city of Antofagasta, Region II	955
Do.		Sociedad Chilena del Litio Ltda. [Chemetall GmbH (Rockwood Holdings Inc., 100%), 100%]	Chemetalle Foote plant at La Negra, near the city of Antofagasta, Region II	50
Potassium chloride (KCl)		Sociedad Contractual Minera Virginia (Inverraz S.A., 100%)	Mine and plant near Iquique, Region I	NA
Do.		ACF Minera S.A.	Lagunas Mine and plant near Iquique, Region I	NA
Pumicite, including pozzolan		Empresas El Melón S.A.	Quarry at Rinconada Lo Vial near Maipu, and plant at Santiago, Santiago Metropolitan Region	1,200
Do.		Compañía Minera Polpaico Ltda.	Puzolana Norte Mine, Region II; and Puzolana Pudahuel Mine and a plant in the Santiago Metropolitan Region	NA
Do.		Minera Río Teno S.A. (Cementos Bío Bío S.A., 100%)	Quarry and plant near Curico, Region VI	200
Do.		Minera El Way S.A. (Cementos Bío Bío S.A., 100%)	Quarries and plant near Antofagasta, Region II	100
Do.		Harborlite Chile Ltda. (IMERYS S.A., 100%)	Laguna del Maule Mine at Talca, Region VII, and plant at Santiago, Santiago Metropolitan Region	NA
Pyrophyllite	metric tons	Sociedad Minera Godoy Schwenger y Cía.	Mine and plant near La Calera, Region V	1,800
Do.	do.	José Orrego Bugueño S.A.	Mine and plant near Chincolco, Region V	1,000
Do.	do.	Mario Alberto Pizarro A. S.A.	Plant at Los Vilos, Region IV	1,000
Rhenium, metal	kilograms	Molibdenos y Metales S.A. (MOLYMET) (private, 100%)	Nos plant, San Bernardo, 30 kilometers south of Santiago, Santiago Metropolitan Region	30,000
Salt, NaCl		Sociedad Minera Punta de Lobos Ltda. (K+S Aktiengesellschaft, 100%)	Open pit mine in the Salar Grande de Tarapaca, Region I, and port facilities at Puerto Patillos	7,000 [1]
Do.		Benjamín Nuñez Ltda.	Mine near Iquique, Region I	NA
Do.		Inversiones Alpina Ltda.	Mine in the Salar Grande Irlanda and plant at Iquique Region I	NA
Do.		Playa Grande Ltda.	Mine in Region I	NA
Do.		José Álvarez Jara Ltda.	do.	NA
Do.		Christian Fletcher Ltda.	do.	NA
Do.		Elías Echeverría Ltda.	do.	NA
Do.		Cía. Minera Cordillera Chile S.C.M.	do.	NA

See footnotes at end of table.

TABLE 2—Continued
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Selenium	metric tons	Corporación Nacional del Cobre (CODELCO) (Government, 100%)	Ventanas smelter and refinery, noble metals plants, Region V (byproduct of copper production)	95
Silica, quartz		Cedric Fernández y Compañía Ltda.	Mine and plant near Calama, Region II	100
Do.		Antonio Zotti Rosetti y Cía. Sociedad Minera	La Confianza and San Jose Mines near Los Vilos, Region IV; Margarita and San Nicolas Mines, and a plant near Renca, Santiago Metropolitan Region	20
Do.		Minera Alfa Quintay Ltda.	Quarry and plant, Santiago Metropolitan Region	30
Do.		Minera Pacífico Ltda.	do.	NA
Do.		Minera Granos Industriales Ltda.	El Turco Mine and Migrin Plant near Cartagena, Region V	250
Do.		Productora Cuarzo El Peral Ltda.	El Peral Mine and plant near Cartagena, Region V	250
Do.		Sociedad Legal Minera Pedro Luís	Mine and plant near Copiapo, Region III	120
Do.		Minera San Pedro Ltda.	Natacha Mine and El Rulo plant at Til-Til, Santiago Metropolitan Region	30
Do.		SLM Santa Dorila de las Arenitas	Mine and plant at Constitucion, Region VII	250
Do.		Cristalerías Toro S.A.	Mine at Rancagua, Region VI	120
Do.		Vidrios Lirquén S.A.	Mine and glass plant at Lirquen, Region VIII	80
Do.		Minera Arsil S.A.	Mine and plant at Concepcion, Region VIII	50
Silver:				
Metal grains	kilograms	Corporación Nacional del Cobre (CODELCO) (Government, 100%)	Ventanas refinery, Region V	220,000
Mine output	do.	do.	Andina, CODELCO Norte, El Teniente, and Salvador Divisions	300,000
Do.	do.	Compañía Minera Mantos de Oro (Kinross Gold Corp., 100%)	La Coipa Mine and plant, Region III, 140 kilometers north of Copiapo	200,000
Do.	do.	Cía. Minera Meridian S.A. (Yamana Gold Inc., 100%)	El Peñón Mine and concentration plant, Region II	320,000
Do.	do.	Minera Florida S.A. (Yamana Gold Inc., 100%)	Minera Florida Mine and concentration plant, Santiago Metropolitan Region	25,000
Do.	do.	Minera Escondida Ltda., 100%	Escondida copper mine and plants, Region II	180,000
Do.	do.	Empresa Nacional de Minería (ENAMI) (Government, 100%)	Manuel Antonio Matta plant, Paipote; Osvaldo Martínez plant, El Salado; Vallenar plant, Region III; and José Antonio Moreno plant, Taltal, Region II	6,000
Do.	do.	Compañía Minera Cerro Bayo Ltda. (Mandalay Resources Corp., 100%)	Cerro Bayo Mine and concentration plant, Region XI	60,000
Do.	do.	Compañía Minera Doña Inés de Collahuasi SCM, 100%	Collahuasi Mine and plants, Region I	60,000
Do.	do.	Compañía Minera Los Pelambres S.A., 100%	Los Pelambres Mine and plant, Region IV	42,000
Do.	do.	Anglo American Sur S.A., 100%	Los Bronces Mine and plants, Santiago Metropolitan Region	35,000
Do.	do.	Cía. Contractual Minera Candelaria, 100%	Candelaria Mine and concentration plant, Region III	30,000
Do.	do.	Cía. Contractual Minera Ojos del Salado, 100%	Ojos del Salado copper mine and plant, Region III	4,500
Do.	do.	Sociedad Contractual Minera El Toqui Ltda. (Breakwater Resources Ltd., 100%)	El Toqui Mine and Doña Rosa concentration plant, Region XI, 120 kilometers north of Coyhaique	11,000
Sodium sulfate	metric tons	SQM Químicos S.A. [Sociedad Química y Minera de Chile S.A. (SQM), 100%]	Nueva Victoria Mine, Region I, and Maria Elena Mine and Coya Sur plant, Region II	80,000
Do.	do.	Sociedad Legal Minera Santa Inés Uno de Antofagasta	Santa Ines Mine near Antofagasta, Region II	150
Steel, crude		Cía. Siderúrgica Huachipato S.A. (subsidiary of CAP S.A.) (private, 100%)	Primary plant in Talcahuano and plant in Rengo, Region VIII	1,450
Do.		Gerdau AZA S.A.	Steel plants in Renca and Colina, Santiago Metropolitan Region	520
Sulfuric acid		Xstrata Copper Chile S.A. (Xstrata plc, 100%)	Altonorte smelter, Region II	900 [1]
Do.		Anglo American Sur S.A. (Anglo American plc, 100%)	Chagres smelter, Region V	500
Do.		Corporación Nacional del Cobre (CODELCO) (Government, 100%)	Ventanas sulfuric acid plant, Region V	370
Do.		do.	Caletones plant, Region VI	1,000
Do.		do.	Chuquicamata plant, Region II	500
Do.		do.	Portrerillos plant, Region III	100
Do.		Empresa Nacional de Minería (ENAMI) (Government, 100%)	Hernán Videla Lira smelter, Paipote, Region III	290

See footnotes at end of table.

TABLE 2—Continued
CHILE: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Talc	metric tons	Sociedad Talco Eduardo Martín Abejón Ltda.	Mines near Constitucion, Region VII, and plant at Santiago, Santiago Metropolitan Region	1,000
Do.	do.	Minera Trucco Ltda.	Mine and plant near Santiago, Santiago Metropolitan Region	NA
Travertine, dimension stone	do.	Mármoles San Marino Chile S.A. (Grupo San Marino S.A., 100%)	Quarry near Calama, Region II, and plant in Til-Til, Santiago Metropolitan Region	7,000
Do.	do.	Andes Travertine & Stones S.A.	Quarry and plant in Region II	NA
Do.	do.	Canteras de Atacama S.A.	Quarry and plant at Calama, Region II	6,000
Zeolites	do.	Sociedad Legal Minera Serrín Tercera	Serrin Tercera Mine and Remulcao Plant at Talca, Region VII	300
Zinc in concentrate	do.	Sociedad Contractual Minera El Toqui Ltda. (Breakwater Resources Ltd., 100%)	El Toqui Mine and Doña Rosa concentration plant, Region XI, 120 kilometers north of Coyhaique	35,000
Do.	do.	Minera Florida S.A. (Yamana Gold Inc., 100%)	Minera Florida Mine and concentration plant, Santiago Metropolitan Region	6,500

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.
[1]Reported figure.
[2]Solvent-extraction/electrowinning.
[3]No production during 2010.