2008 Minerals Yearbook

ECUADOR

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

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The Mineral Industry of Ecuador

By Susan Wacaster

In 2008, the Republic of Ecuador maintained its position as the fifth ranked petroleum producer in Latin America. During the year, the country's administration was focused on mining industry legislation, especially that related to the metals sector, because of the inevitable role it would play in the Ecuadorian economy in the foreseeable future. Recent discoveries of major metals deposits and the election of a new President in 2007 brought about changes, such as the establishment of a Constituent Assembly that was charged with rewriting the country's Constitution, submission of a mining bill to the legislature by the President, and the passage of the Mining Mandate, which ordered a temporary moratorium on mining activities. In September 2008, a new Constitution for Ecuador was approved through a national referendum. Article 408 of the Constitution established that nonrenewable natural resources, including nonfuel mineral and hydrocarbon deposits, were the inalienable property of the state. The Constitution grants the state the right to regulate nonrenewable resources in such a way as to guarantee a good quality of life for the population while maintaining sustainable development and cultural diversity and conserving biodiversity and the capacity for natural regeneration of ecosystems (Government of Ecuador, 2009, p. 2).

Government Policies and Programs

In April 2008, the Mining Mandate passed by the Constituent Assembly of Ecuador suspended exploration activities for 6 months or until a new Mining Act could be approved. It revoked 80% of the nation's mineral concessions and suspended the other 20%. All mineral concession applications that were in process were cancelled, and the mandate proposed limiting the number of mineral concessions an entity could hold to three (AndeanGold Ltd., 2008, p. 7).

In November 2008, the Ecuadorian President announced that he would send a mining bill to the Congresillo, which was the legislative commission of Ecuador. The bill sought to change the 3% to 8% royalty on mineral sales to at least 5%; however, it did not specify a maximum amount. It also called for two types of contracts to be established between mining companies and the Ecuadorian Government, that is, contracts for (1) exploitation and (2) services. Further, a windfall tax would be levied on the revenue earned by companies from metals sales. The tax would apply to the difference between the sales price for the metals produced in the country and the fixed price established in a contract with the state. A windfall profits tax of 70% was passed by the Government in 2007; however, a base price had not yet been determined. It was reported that in the 2008 bill, the base prices for the tax might be negotiated independently for each contract granted by the Government, but the price would not be below the international metals market price at the time the contract was signed. The new law was expected to bring an end to the 6-month Government ban on mining and possibly establish a new state mining corporation to regulate mining activity (AndeanGold Ltd., 2008, p. 11; Kosich, 2008).

On January 29, 2009, after having gone through a review, amendment, and approval process, which included input from Ecuador's President, the country's National Assembly passed the new Mines Law (2009 Law). Under the new law, exploration was to be characterized as initial or advanced. The initial stage would last for 4 years and there would be an opportunity to apply for two 2-year extensions in the advanced stage. No limit was established as to how many concessions a concessionaire could hold during the exploration stage, but no single concession was to exceed 5,000 hectares during the exploration and exploitation stages. Upon completion of the initial exploration, the concessionaire would be required to reduce the concession size, with a further reduction following advanced exploration, to satisfy yet-to-be-determined guidelines. Concessionaires would be required to negotiate exploitation contracts with the Government on a case-by-case basis and to submit environmental impact studies to obtain permits (AndeanGold Ltd., 2008, p. 11; Corriente Resources Inc., 2009, p. 3).

Sixty percent of the royalties earned from mining were to be earmarked for productive sustainable local development projects. In certain (unspecified) cases, 50% of that amount could be directed towards the governmental bodies of the indigenous communities or territorial constituencies. Funds would be prioritized to meet the needs of the communities directly affected by mining activities. Any disputes related to human rights, environmental issues, regulatory compliance, and contract provisions were to be resolved in local or other Latin American courts (AndeanGold Ltd., 2008, p. 11; Government of Ecuador, 2009, p. 17).

The Ministry of Mines and Petroleum (MMP) had up to 180 days to draft specific mining regulations for the implementation of the new law, which also would have to be approved by the National Assembly and the President. Once the regulations were finalized, concessionaires would have 120 days for their concessions to comply with regulations. In a presentation given on March 2, 2009, at the Prospectors and Developers Association of Canada conference in Toronto, Ontario, Canada, the Sub-Secretary of Mines announced that all the suspensions on mining activities were lifted and that mining companies would receive formal notices to that effect (AndeanGold Ltd., 2008, p. 11).

Minerals in the National Economy

According to estimates reported by the Economic Commission for Latin America and the Caribbean, there was almost no variation in the real value of production by the mining sector in 2008 compared with that of 2007 whereas there was a 4.8% decrease in the real value of production by the mining sector in 2007 compared with that of 2006. The

Central Bank of Ecuador reported that the value contributed to the GDP from the exploitation of mines and quarries in 2008 was about $4,367 million compared with $4,368 million in 2007. The nation had a positive account balance of $1.2 billion with the Organization of the Petroleum Exporting Countries (OPEC) compared with $1.7 billion in 2007. Ecuador had a negative OPEC balance for most years since at least the late 1980s until 1991. Ecuador had accrued a $5.7 million debt to the organization because of nonpayment of fees between 1992 and 2007. The country had agreed to a 3-year repayment plan to resolve its debt (Alexander's Gas & Oil Connections, 2007; Banco Central del Ecuador, 2009b; Comision Economica Para America Latina y el Caribe, 2009; Organization of the Petroleum Exporting Countries, 2009, p. 15).

Production

Data on mineral production are in table 1. Because of the upheaval in the mining industry in Ecuador in 2008, there were numerous mineral commodities for which no production data were available. Also, some petroleum products were reclassified. Asphalt, turpentine, and solvents were reported by the country as part of the total for the category "other petroleum products," and gasoline was reported as the sum total of two grades that were previously reported separately. Significant production decreases were expected in the nonfuel minerals sector for 2008 owing to the Mining Mandate, the exact magnitude of which may have varied depending upon the type of commodity produced. Production of industrial minerals and construction materials may not have been affected as much as the metal and fuel sectors because the former are important to local industry. Estimates were made based upon that assumption; however, as production data become available, these estimates may be subject to revision (table 1).

Structure of the Mineral Industry

Ascendant Copper Corp. of Canada changed its name to Copper Mesa Mining Corp. in July 2008. At that time, the company was waiting for the publication of specific mining regulations and to have discussions with the MMP before making any final determinations on its Ecuadorian investments. The company held a 100% interest in both the Chaucha copper molybdenum project and the Junin copper, gold, molybdenum, and silver porphyry project. It had an interest in the Telimbela copper molybdenum property and reported that it had exclusive use of an extensive exploration database developed for Ecuador by Rio Tinto Mining and Exploration Ltd.

Copper Mesa's Junin project was located in Imbabura Province in northwest Ecuador. Inferred mineral resource estimates included 982 million metric tons (Mt) grading 0.89% copper, 0.04% molybdenum, and 1.9 grams per metric ton (g/t) silver. The Junin project had faced strong local opposition since its discovery and initial exploration in the late 1990s. Ascendant acquired the property in mid-2004 and by 2006 had announced exploration plans. In December 2006, however, a group opposed to the mining activities in the area took 57 Ascendant employees hostage for a week on the grounds that the mining concession was in a nature preserve; the group claimed that the project was illegal and demanded that Ascendant be prohibited from building an open pit mine. In 2007, negotiations were held between the company, the Government, and members of the environmental advocacy group that opposed mining activities in the region. Agreements, which included a number of compromises designed to restore stability to the area, were signed by all three groups.

Ascendant reported that in January 2008, it received cancellation notices from the Regional Director of Mines for the Golden 1 and Golden 2 concessions on the basis that they were granted unconstitutionally. In September, after an appeal by the company (by then called Copper Mesa) to the Constitutional Tribunal Court of Ecuador, the national Director of Mines reportedly confirmed that the Golden 1 and Golden 2 concessions were to be reinstated and instructed the applicable Government agencies to take all necessary steps to put the reinstatement order into effect.

Copper Mesa reported that it received a similar notice from the same office of the MMP in November 2008 advising it of the annulment of the company's Golden 1 and Golden 2 concessions for a different reason—that the company did not have an environmental impact assessment (EIA) for drilling. The company stated that it had submitted an EIA for the Junin project to the MMP in September 2006, and the MMP subsequently asked the company to provide clarification on certain items. Clarification of the EIA items was reportedly in the process of being addressed when the Mining Mandate moratorium was implemented. The company reported that it responded to the notice and the matter went to the Constitutional Tribunal Court. During 2008, Copper Mesa was also notified of the cancellation of mineral concessions within its Magdalena property holdings, including the Aylen, the Magdalena, and the San Pedro concessions, because of the lack of an EIA on file (Copper Mesa Mining Corp., 2008, p. 1-5).

Channel Resources Ltd. of Canada withdrew from an option agreement that it had with Minera Cachabi C. Ltda. (Mineca) for the Mozo epithermal gold project in Azuay Province. In 2005, Channel earned a majority interest in the property from Mineca and subsequently completed mapping, surveys, sampling, drilling, and limited metallurgical testing. Channel suspended its expenditure commitments under the option agreement for the Mozo project for a period of 6 months after the mandate and later withdrew from the agreement completely, citing increased market aversion and heightened risk owing to the introduction of mining law revisions.

In 2007, Channel had formed an alliance with Azimut Exploration Inc. to acquire large-scale mineral deposits, and the companies subsequently submitted concession applications to the Government of Ecuador. After the cancellation of all new applications for exploration licenses, the companies extended their initial property acquisition period to January 9, 2009; however, in 2008, Channel reported that it was unlikely that the companies would proceed with any further investment in Ecuador in the near future, citing general market conditions and what it called a negative investment environment in Ecuador brought on by the Government's ban on mining (Channel Resources Ltd., 2009, p. 4).

Corriente Resources Inc. of Canada's Mirador and Panantza-San Carlos projects were advanced polymetallic development projects. In 2006, the Mirador project had been expected to begin production in late 2008. In December 2006, in response to local mining protests, however, the Government suspended activities at both the Mirador and the Panantza-San Carlos concessions. In 2007, the company delayed startup of the Mirador project to mid-2009 and cancelled agreements with suppliers of long-lead-time components. In 2007 and early 2008, the company proceeded with offsite engineering and feasibility work, which resulted in the announcement of a completed feasibility study for the Mirador project on April 3, 2008. The feasibility study called for expanded daily throughput at the concentrator facility of 30,000 metric tons per day (t/d) compared with a 2005 design capacity of 25,000 t/d (Corriente Resources Inc., 2009, p. 1-5).

Corriente released resource estimates that included total measured and indicated resources at Mirador of 2.7 Mt of copper, 670,000 kilograms (kg) of silver, and 85,200 kg of gold, and inferred resource estimates of 1.23 Mt of copper, 308,000 kg of silver, and 38,900 kg of gold. At Mirador Norte, an estimate of indicated resources included 871.4 million kilograms (Mkg) of copper and 15,200 kg of gold with inferred resources of 232,700 Mt of copper and 45,800 kg of gold. The company reported total inferred resources for the Panantza-San Carlos concession of 3 Mt of copper (Corriente Resources Inc., 2009, p. 1-5).

In 2008, Corriente was seeking a project partner. The company held 23 concessions in Ecuador at yearend. In December, the company announced that negotiations with an unnamed party had expanded to the potential sale of the entire company and that the negotiation period would extend to March 31, 2009. The company announced that on March 17, 2009, it received an official notice signed by the Minister of the MMP that authorized the company to reinitiate its field operations. Before resuming any drilling activity, however, the company planned to update its water use concession and its environmental permits with the appropriate agencies. It was the opinion of the company's management that it would take at least 24 months from the time all permits and financing were in place and a construction date was determined to begin production at the Mirador project. In 2008, the Government approved the environmental license for Corriente to build and operate a dedicated seaport near Machala for the shipping of copper concentrate (Corriente Resources Inc., 2009, p. 1-5).

In its 2008 annual report, Corriente lauded the Ecuadorean President's efforts to support responsible large-scale mining, citing his leadership in shaping public opinion in such a way that would assist the company to secure a partner with which to advance the development of its Mirador and Panantza-San Carlos properties and emphasized the benefit that their projects would provide to the Government, Ecuadorian communities, and the company's shareholders. Corriente reported that the Government of Ecuador had advanced the development of the Zamora Hydroelectric Complex project, which was to be located in the Zamora River Basin in southeast Ecuador, and was expected to double the nation's hydroelectric power potential. One of the sites within the complex would be the 1,200-megawatt San Juan Bosco project located 6 kilometers (km) south of the company's Panantza–San Carlos copper deposits. In its yearend report, the company indicated that the advancement of the hydroelectric projects would help supply the energy needs of the large-scale mining complexes at Mirador and Panantza–San Carlos, stating that, by moving forward with the hydroelectric project, the Government had responded to the company's initiatives and investments in the country (Corriente Resources Inc., 2008; 2009, p. 1-5).

EcuaGold Resources Ltd. changed its name to AndeanGold Ltd. in October 2008. Early in the year, the company reported that because of the uncertainties created by proposed changes in Ecuador's mining regulations and the passage of the Mining Mandate, it would focus on exploration activities outside of Ecuador. Four of the company's Ecuadorian concessions, which encompassed more than 15,000 hectares, were cancelled. Two other projects under option by the company from a third party, totaling 4,400 hectares, were also cancelled. The latter were cancelled because of the Mining Mandate requirement that all concessions in the country have an approved EIA report and that at least some exploration expenditures had to have been incurred as of December 31, 2007, and neither of the two projects met these requirements (the requirements were not part of the Mining Law when the concessions were granted) (AndeanGold Ltd., 2008, p. 7).

Mariana Resources Ltd. ceased activities and withdrew from Ecuador citing the upcoming legislative and policy changes to be enacted as a result of the Mining Mandate. Properties included the Fierro Urco, La Victoria, La Virgen, and the Macara, which are located in southern Ecuador near major gold deposits, such as the Fruta del Norte, the Gaby, the Quimsacocha, and the Rio Blanco deposits (Mariana Resources Ltd., 2009, p. 6).

In October 2008, Brazil's partially state-owned petroleum company Petróleo Brasileiro S.A. (Petróbras) and the Government of Ecuador reportedly agreed to extend the company's current contract in Ecuador for another year, at which time the contract would be renegotiated and the company would enter into a service-provider agreement. Petróbras operated Ecuador's Block 18 in the Amazon region. In September, Petróbras transferred its interests in exploratory Block 31 back to Ecuador's state oil company Petroecuador. The talks with Petróbras were part of the Government's overall strategy to convert existing participation contracts into service-provider contracts. Perenco plc agreed to enter into a modified participation contract for 1 year before changing over to a service contract. By late October, Spain's Repsol YPF S.A. has not yet agreed to new terms with Ecuador's Government (Palmigiani, 2008).

Mineral Trade

Crude oil was Ecuador's main export product, and revenues from its sale were reported to finance about 35% of Government spending. The total value of imports to Ecuador was $18.7 billion compared with $12.6 billion in 2007. In 2008, the total value of exported goods from Ecuador was $18.5 billion, of which the value of petroleum exports was $11.8 billion compared with $13.9 billion and $8.3 billion, respectively, in 2007. The volume of crude oil exports in 2008 was about 127.5 million barrels (Mbbl) [349,400 barrels per day (bbl/d)] compared with about 124.7 Mbbl (341,700 bbl/d) in 2007. The volume of exported refinery products was about 15.4 Mbbl (42,200 bbl/d) (Organization of the Petroleum Exporting Countries, 2009, p. 9, 12, 14, 31).

Ecuador was the United State's 41st ranked goods trading partner. Total trade between the two countries was valued at $12.5 billion in 2008. United States' goods exported to Ecuador in 2008 were valued at $3.5 billion, which was a 17.5% increase compared with the value in 2007. Mineral fuel exports, which were valued at $529 million, was the second ranked export category. Ecuador was the United States' 35th ranked supplier of goods in 2008. Goods imported by the United States from Ecuador were valued at $9.0 billion in 2008, which was a 47.5% increase compared with the value in 2007. Mineral fuel imports, which were valued at $7.3 billion, was the leading import category. United States foreign direct investment in Ecuador was valued at $673 million in 2007 (the latest year for which data were available), which was a 21.5% increase compared with the value of investment in 2006. United States direct investment in Ecuador was primarily concentrated in the mining, manufacturing, and wholesale trade sectors. Ecuador's foreign direct investment in the United States was valued at $12 million in 2007, which was a 40% decrease compared with that of 2006 (Office of the United States Trade Representative, 2009).

Commodity Review

Metals

Gold.—Dynasty Metals & Mining Inc. owned 100% of three advanced-stage gold projects, including the Dynasty Goldfield, the Jerusalem, and the Zaruma projects, all located in southern Ecuador. Resource estimates at Dynasty Goldfield included 14,600 kg of measured resources, 16,800 kg of indicated, and 35,800 kg of inferred resources of gold. The Jerusalem deposit had an estimated 239,700 kg of measured resources, 10,700 kg of indicated resources, and 22,100 kg of inferred resources of gold. The Zaruma deposit had an estimated 680 kg of measured resources, 12,700 kg of indicated resources, and 43,000 kg of inferred resources of gold. The company also reported that the Zaruma deposit had 165,500 kg of measured resources, 216,800 kg of indicated resources, and 454,000 kg of inferred resources of silver. Dynasty predicted commissioning of the Zaruma gold plant in April 2009 (Dynasty Metals & Mining Inc., 2009).

As of June 30, International Minerals held a 100% interest in the Rio Blanco gold and silver property and between 55% and 100% interest in the concessions that make up the Gaby gold property, both of which were development-stage projects. In 2006, the reserve estimate for Rio Blanco included 18,800 kg of proven and probable reserves of gold and 134,000 kg of silver reserves. The Gaby project was on hold between 1997 and early 2006. As a result of rising gold prices, the company commenced a preliminary feasibility study in March 2006 that was completed in February 2008. The combined measured and indicated resources were estimated to be approximately 194,100 kg of gold and 284,000 metric tons of copper. In March 2008, the company announced that it would purchase the remaining 50% interest in the Papa Grande deposit at Gaby, which would increase International Minerals' measured and indicated resources for the Gaby project to an estimated 142,800 kg of contained gold from 117,600 kg of contained gold. It would also increase the inferred resources to 63,100 kg from 51,600 kg of contained gold (International Minerals, 2008, p. 3-4).

IAMGOLD Corp. of Canada's Quimsacocha project was an advanced exploration project. On July 29, the company released results of the prefeasibility study, which showed that during the first 3 years, Quimsacocha could produce an average of 7,000 kilograms per year (kg/yr) of gold and that over a projected mine life of 7.5 years, the current deposit would produce an average of 2,300 kg/yr of gold. A final feasibility study for Quimsacocha was expected to take approximately 12 months to complete after the necessary work permits were received, and the project was targeted to commence in the second half of 2010 with commercial production in 2012 (IAMGOLD Corp., 2009, p. 63).

Mineral Fuels

Natural Gas.—In 2008, Ecuador's natural gas reserve estimate was 8 billion cubic meters, which was the same as in 2007. Natural gas reserve estimates had been steadily decreasing since 1990 when reserves were estimated to be 111 billion cubic meters and decreased significantly in 1999 to 29 billion cubic meters. Marketed production of natural gas (which includes gross withdrawals from reservoirs less the quantities used for reservoir repressuring and the quantities vented or flared) was 680 million cubic meters compared with 830 million cubic meters in 2007 (Organization of the Petroleum Exporting Countries, 2009, p. 19, 23).

Petroleum.—In 2008, Ecuador produced about 185 Mbbl of petroleum, which accounted for 0.7% of the world's total production for the year and was a 1.2% decrease compared with production 2007. Ecuador was the last ranked country among the 13 OPEC nations; however, it was the only other Latin American nation in OPEC besides the relatively larger and oil-rich nation of Venezuela. Ecuador's 2008 production volume accounted for 0.7% of the world total, which was a 1.2% decrease compared with that of 2007. The country's crude oil reserve was 6.5 billion barrels (Gbbl) in 2008 compared with 6.4 Gbbl in 2007. Ecuador's petroleum reserve estimates had been steadily increasing since 1990 when it was 1.4 Gbbl, with a significant increase in 1992 to 3.2 Gbbl (Banco Central del Ecuador, 2009a; BP p.l.c., 2009; Organization of the Petroleum Exporting Countries, 2009, p. 17, 21).

Refinery Products.—The production volume of refinery products in 2008 was about 53 Mbbl compared with 52 Mbbl in 2007. Refinery capacity was about 68.8 Mbbl (188,400 bbl/d), which was the same as in 2007, when refinery capacity increased for the first time since 1991. Petroecuador and Petróleos de Venezuela, S.A. were in the planning stages for the development of a 300,000-bbl/d refinery in Manabi Province in

2008. Consumption of refined products in Ecuador was about 66.2 Mbbl (181,300 bbl/d) in 2008 compared with 63.7 Mbbl (174,500 bbl/d) in 2007 (Banco Central del Ecuador, 2009a; Organization of the Petroleum Exporting Countries, 2009, p. 25, 27, 29; U.S. Energy Information Administration, 2008).

Outlook

After nearly 2 years of legal uncertainties in Ecuador's mining sector, the Government seems to have positioned itself to manage the exploration and exploitation of valuable mineral deposits within its territory. The cancellation of many mining concessions did effectively reduce the amount of land being held speculatively. Differing reports stated that those properties would be auctioned publicly, returned to the state, or be permitted to resume activities, but no specifics regarding the outcome for all the disputed concessions was readily available. When the Mining Mandate went into effect in April 2008, there was discussion about creating a new state-owned mining company that would monitor mining activities in the country. This was also mentioned in reports associated with the passing of the new mining law; however, the status of that endeavor was not clear at the time that this report was written.

Several companies with advanced projects and long-term investments in the country seem prepared to negotiate with Ecuadorian officials to bring projects to the production stage, possibly before the end of 2009, and report confidence that, despite all the delays, business is likely to proceed in Ecuador with the full support of the Government. Opposition is present from environmental activists and local communities concerning the risk that the mining industry poses to the environment but the Government continues to advocate for the revenue that the exploitation of major new metal discoveries could bring to the nation. Meanwhile, the availability of data and information from within the country regarding production of basic materials, such as industrial minerals and construction materials, seems to have diminished. The reorganization of ministries and their data reporting sources remain to be finalized, after which time production data may start being reported again. Within 12 to 24 months, the Ecuadorian mining sector will likely begin to play a more significant role in the regional supply of metals and is likely to remain so for at least a decade after the commencement of production.

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TABLE 1
ECUADOR: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2004	2005	2006	2007	2008[e]
METALS						
Copper, mine output, Cu content		242	--	--	--	--
Gold, mine output, Au content	kilograms	5,128	5,338	5,168	3,186	800
Silver, mine output, Ag content	do.	372	283	159	449	112
Steel, crude, continuously cast, electric furnace[e]		72,000	84,000	85,000	87,000	85,000
INDUSTRIAL MINERALS						
Barite		3,695	--	--	--	--
Carbon dioxide (CO_2)		685	589	592	70	NA
Cement, hydraulic[e, 2]	thousand metric tons	3,470	3,690	4,110	4,420	5,493 [3]
Clays:[4]						
Common	do.	903	1,318	1,309	873	800
Kaolin		5,646	25,078	11,504	18,618	15,000
Feldspar		53,469	38,250	67,844	14,308	14,000
Gypsum, crude		232	1,311	1,478	--	--
Pozzolan		612,256	540,318	700,007	582,560	580,000
Pumice		183,119	107,178	8,730	153,500	100,000
Sand:						
Silica (quartz) sand		32,148	37,790	36,208	--	NA
Ferruginous		11,325	9,252	--	--	NA
Stone, sand and gravel:						
Limestone[4]	thousand metric tons	4,700	4,855	5,457	5,374	NA
Marble		1,431	3,033	31,840	--	NA
Sand and gravel, for construction	thousand cubic meters	5,834	5,662	4,997	1,920	1,600
Zeolites		3,300	2,400	--	--	NA
MINERAL FUELS AND RELATED MATERIALS						
Gas, natural:						
Gross	million cubic meters	1,181	1,347	1,309	1,196	1,200
Of which, marketable	do.	750 [r]	650 [r]	680	830 [r]	680 [3]
Liquefied natural gasoline	thousand 42-gallon barrels	542	458	300	299	300
Petroleum:						
Crude	do.	192,517	194,169	195,948	186,669	184,746 [3]
Refinery products:						
Liquefied petroleum gas	do.	2,412	2,259	2,311	1,614	1,924 [3]
Gasoline	do.	8,816	6,954	7,273	7,311	17,090 [3, 5]
Jet fuel	do.	2,235	2,500	2,699	2,913	NA
Distillate fuel oil	do.	13,397	13,064	12,677	11,789	8,561 [3, 6]
Residual fuel oil	do.	22,851	21,255	21,969	23,052	13,251 [3, 7]
Asphalt	do.	1,158	990	1,025	990	NA
Turpentine	do.	19	23	35	45	NA
Solvents, including rubber solvent	do.	21	32	41	62	NA
Other, including oils and lubricants	do.	88	102	5,310	4,447	12,267 [3, 8]
Total	do.	50,997	47,179	53,340	52,223	53,093

[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 October 15, 2009. Limited 2008 Ecuadorian mineral production data were publically available because of a mining moratorium and restructuring among data reporting groups.

[2]Estimated figures equal to reported consumption minus imports of cement and clinker.

[3]Reported figure.

[4]No reports of separate quantities for clay or limestone used in cement production were available.

[5]2008 data for gasoline are reported as a sum total of two grades of gasoline—super and extra.

[6]Reported as Fuel Oil #4.

[7]Reported as Fuel Oil #6.

[8]2008 data for other refinery products were reported to include asphalt, jet fuel, turpentine, and solvents.

TABLE 2
ECUADOR: STRUCTURE OF THE MINERAL INDUSTRY IN 2008

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Cement		Holcim Ecuador S.A. (Holcim Ltd., 92.1%, and other private, 7.9%)	Cerro Blanco Plant, Guayaquil, Guayas Province, and San Rafael grinding plant, Latacunga, Cotopaxi Province	3,500
Do.		Cementos Selva Alegre S.A. (Lafarge S.A., 98.2%, and other private, 1.8%)	Cement plant near capital city of Quito, Pichincha Province	700
Gold	kilograms	Small-scale and artisanal mining operations (private, 100%)	Western and eastern cordilleras, southern Ecuador	8,000
Petroleum:				
Crude	thousand 42-gallon barrels	PETROPRODUCCIÓN [Empresa Estatal Petróleos del Ecuador (Petroecuador) (Government, 100%)	About 26 active fields, led by Sacha, Sucumbios Province, and Shushufindi, Napo Province	71,000
Do.	do.	ENAP Sipec [Empresa Nacional del Petróleo S.A., 40%, and Empresa Estatal Petróleos del Ecuador (Petroecuador, 60%)]	Biguno, Huachito, Mauro Davalos Cordero, and Paraiso fields, Napo Province	7,000
Do.	do.	Empresa Estatal Petróleos del Ecuador (Petroecuador) (Government, 100%)	Most production from Eden Yuturi field, Block 15, Napo Province, but also from Indillana and Yanaquincha wells; Limoncocha field, Block 15, Sucumbios Province	37,000
Do.	do.	Petro Oriental S.A. [Andes Petroleum Co. Ltd. (Chinese National Petroleum Corp, 55%, and China Petrochemical Corp., 45%)]	Hormiguero, Nantu, Wanke fields, Block 14, Napo Province; fields in Block 17, Napo and Pastaza Provinces	3,200
Do.	do.	Perenco PLC and ConocoPhillips Co. Block 7 (Perneco PLC, 57.5%, and ConocoPhillips Co., 42.5%) Block 21 (Perenco PLC, 53.7%, and ConocoPhillips Co., 46.3%)	Six fields in Blocks 7 and 21 led by the Yuralpa field, Block 21, Pastaza Province	9,500
Do.	do.	Repsol YPF S.A.	Amo, Bogui-Capiron, Daimi, Ginta, and Iro fields; three other small fields, Block 16, Napo Province	23,300
Do.	do.	Agip Petroleum Ecuador Ltd. (Eni S.p.A., 100%)	Villano field, Block 10, Pastaza Province	15,000
Refinery products	do.	Empresa Estatal Petróleos del Ecuador (Petroecuador) (Government, 100%)	Esmeraldas refinery, Esmaraldas Province	40,200
Do.	do.	do.	Libertad refinery, Guayas Province	16,800
Do.	do.	do.	Amazonas refinery and gas plant, Napo Province	7,300
Do.	do.	do.	Lago Agrio refinery, Sucumbios Province	375
Sand and gravel (aggregates)		Holcim Agregados S.A. (Holcim Ecuador S.A., 100%)	Two plants near Manta and Portoviejo, Manabi Province, and one plant near the capital city of Quito, Pichincha Province	2,500
Steel, crude	metric tons	Complejo Siderurgico ANDEC - FUNASA (Acerías Nacionales del Ecuador-Fundiciones Nacionales S.A.) (HOLDINGDINE S.A. and other private, 100%)	Complex of plants in Port of Guayaquil, Guayas Province	91,000

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto.