



2011 Minerals Yearbook

DOMINICAN REPUBLIC AND HAITI

THE MINERAL INDUSTRIES OF THE DOMINICAN REPUBLIC AND HAITI

By Susan Wacaster

DOMINICAN REPUBLIC

In 2011, the Dominican Republic was the world's 13th ranked nickel-producing country. Between August 2008 and March 2011, however, Xstrata Nickel of the United Kingdom had halted operations at its Falconbridge Dominicana C. por A. (Falcondo) operation in Bonaó because of high energy costs and diminished market conditions. In 2011, the facility operated at about 50% of capacity throughout much of the year after procuring its power from the domestic electricity grid as opposed to generating power from fuel that was processed at the site's refinery. The company was conducting a feasibility study for converting the operation to natural gas for energy and a return to 100% capacity (Xstrata plc, 2011; Kuck, 2012).

The largest mining project in the Dominican Republic in terms of size in 2011 was Pueblo Viejo Dominicana Corp.'s Pueblo Viejo gold and silver project (Barrick Gold Corp., 60%, and Goldcorp Inc., 40%, both of Canada). Commissioning at the site had been delayed by a major rainfall event in May 2011 that damaged the tailings dam, which was in the construction phase and for which the company had to obtain new tailings permit approvals.

The Dominican Republic created a new autonomous agency in 2010, the Servicio Geológico Nacional (SGN). The SGN was created by Law No. 50–10 and is a part of the Ministry of Economy, Planning, and Development. Departments within the SGN include Geology; Applied and Environmental Geology; Geologic Resources and Mining; Geophysics and Seismic Studies; Hydrogeology; Geographic Information Systems; and Information (Servicio Geológico Nacional, 2012).

Minerals in the National Economy

The Dominican Republic's gross domestic product increased by 4.5% in 2011 compared with 7.8% in 2010. The decreased growth was attributable to inflation that stemmed from increased international prices for oil and other primary goods. The inflation rate was 7.8%, the growth rate of exports was 26.4%, and the rate of direct external investment was 25%. Economic activity within the mining and quarrying sector increased by 79.7% in 2011 compared with just 2.9% in 2010 as a result of the restarting of the Falcondo nickel operation in 2011. The value of activity in the mining and quarrying sector contributed about 0.4% of the total value of the GDP in 2011 compared with just 0.2% in 2010 (Banco Central de la República Dominicana, 2012b, p. 1, 8, 11).

Production

Data on mineral production are in table 1.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Mineral Trade

In 2011, the Dominican Republic exported about 33,900 metric tons (t) of ferronickel valued at \$290 million. The country did not have any recorded exports of nonmonetary gold, dore, or silver in 2011, and there were no reported metallic minerals exports in 2010. The Dominican Republic imported about 9.6 million barrels (Mbbbl) of crude oil valued at \$1.04 billion compared with 9.9 Mbbbl valued at \$777.6 million in 2010. Combustible fuel imports included 10.0 Mbbbl of natural gas (which was valued at \$198.2 million), 8.5 Mbbbl of liquefied petroleum gas (\$544 million), 8.2 Mbbbl of gasoline (\$944.8 million), 6.7 Mbbbl of fuel oil (\$654 million), and 7,144 barrels (bbl) of aviation fuel (\$1.3 million). Other raw material imports included \$714.6 million worth of iron and steel compared with a revised \$598.1 million in 2010 and \$139.8 million worth of coal compared with a revised \$86.4 million in 2010 (Banco Central de la República Dominicana, 2012a).

Commodity Review

Metals

Copper.—In January, Perilya Ltd. of Australia, which was majority owned by Zhongjin Lingnan Nonfemet Co. Ltd. (one of China's leading zinc producers), completed its purchase of GlobeStar Mining Corp. of Canada, thereby acquiring ownership of the Cerro de Maimón Mine in Bonaó. The Cerro de Maimón Mine started up in 2009 and was the only polymetallic mine operating in 2011, which was Zhongjin's first full year of ownership of the mine.

The Cerro de Maimón deposit is a strata-bound copper- and zinc-rich exhalative volcanogenic massive-sulfide lens with a gold-and-silver-bearing oxide cap. The Cerro de Maimón Mine was an open pit operation that produced about 11,700 t of copper, 500 kilograms (kg) of gold, and 18,300 kg of silver in 2011 processed from about 472,000 t of sulfide ore and 209,000 t of oxide ore compared with 9,000 t of copper, 500 kg of gold, and 20,300 kg of silver in 2010. As of October 2011, total reserves and resources at Cerro de Maimón included 150,000 t of contained copper, about 9,000 kg of contained gold, 260,000 kg of silver, and 104,000 t of zinc (GlobeStar Mining Corp., 2010, p. 3–4; Perilya Ltd., 2012, p. 17).

The plant at Cerro de Maimón had a primary crushing and conveying system for both the sulfide and oxide ores. The sulfide ore was processed through both primary and secondary ball mills and a flotation circuit to produce the

copper concentrate. The oxide ore was processed through a ball mill and conventional cyanide-leaching unit for gold and silver recovery. Perilya practiced comprehensive concurrent reclamation at the Cerro de Maimón property using retained topsoil and native plants (Perilya Ltd., 2012, p. 18, 27).

Gold.—By yearend, the oxygen plant at Pueblo Viejo was scheduled to undergo precommissioning testing in early 2012, and the first two autoclaves were slated for precommissioning in mid-2012. As of February 2012, the proven and probable reserves at Pueblo Viejo included about 800,000 kg of contained gold, 5 million kilograms of contained silver, and 257,000 t of contained copper. The mine was expected to produce about 35,000 kilograms per year (kg/yr) of gold in the first 5 years of a 25-year mine life from about 13 million metric tons (Mt) of ore representing about 43,500 kg of contained gold.

The Pueblo Viejo deposit is hosted by the Lower Cretaceous Los Ranchos Formation, which is a series of volcanic and volcanoclastic rocks that extend across the eastern half of the Dominican Republic. The Pueblo Viejo member of the Los Ranchos Formation is confined to a restricted, sedimentary basin filled with lacustrine deposits that include coarse conglomerate and thinly bedded carbonaceous sandstone, siltstone, and mudstone. The basin also hosts pyroclastic rocks, dacitic domes, and diorite dikes. Pueblo Viejo is a high-sulfidation epithermal gold and silver deposit. Gold occurs as aurostibnite, native gold, and sylvanite. The principal carrier of gold is pyrite with submicroscopic gold occurring as inclusions and as a solid solution within the crystal structure of the pyrite. Typical mineralization comprises electrum, enargite-luzonite, gold, and pyrite with minor minerals, including arsenopyrite, chalcopyrite, galena, marcasite, silver sulfosalts, sphalerite, tellurides, and tetrahedrite (Barrick Gold Corp., 2012, p. 17, 41; Goldcorp Inc., 2012).

Nickel.—Falcondo is an open pit mine that has the capacity to produce 29,000 t/yr of nickel contained in ferronickel. The ore is mined, milled, smelted, and refined at Falcondo to produce a ferronickel cone that contains about 38% nickel. The facility includes four mines, a metallurgical treatment plant, a crude oil refinery that had been idled, and a 200-megawatt thermal powerplant. Total reserves and resources as of yearend 2011 included 965,000 t of contained nickel in proven and probable reserves and 69,000 t of contained nickel in inferred resources (Xstrata plc, 2011, p. 36).

The Loma Caribe peridotite, which hosts the Falcondo nickel laterite deposit, contains the main belt of ophiolitic peridotites in the Central Cordillera of the Dominican Republic. The serpentized peridotites, which are composed primarily of harzburgite with subordinate dunite and lherzolite, gave rise to the nickel laterite soils when they were exposed to weathering and erosion in the early Miocene Epoch. The main

nickel-bearing minerals are garnierite and serpentine (Tauler and others, 2009).

Outlook

In 2012, Goldcorp is expected to update reserves and resources for the Pueblo Viejo operation, and nickel production is expected to increase at the Falcondo operation.

References Cited

- Banco Central de la República Dominicana, 2012a, Estadísticas—Sector externo: Santo Domingo, Dominican Republic, Banco Central de la República Dominicana. (Accessed July 27, 2012, at http://www.bancentral.gov.do/estadisticas.asp?a=Sector_Externo.)
- Banco Central de la República Dominicana, 2012b, Informe de la economía: Santo Domingo, Dominican Republic, Banco Central de la República Dominicana, April, 132 p.
- Barrick Gold Corp., 2012, Annual report 2011: Toronto, Ontario, Canada, Barrick Gold Corp., 196 p.
- GlobeStar Mining Corp., 2010, Management's discussion and analysis for the year ended December 31, 2009: Toronto, Ontario, Canada, GlobeStar Mining Corp., March 31, 33 p.
- Goldcorp Inc., 2012, Goldcorp achieves record revenues and cash flow: Vancouver, British Columbia, Canada, Goldcorp Inc. press release, February 15, 25 p.
- Kuck, P.H., 2012, Nickel: U.S. Geological Survey Mineral Commodity Summaries 2012, p. 108–109.
- Perilya Ltd., 2012, 2011 annual report: Perth, Western Australia, Australia, Perilya Ltd., 143 p.
- Servicio Geológico Nacional, 2012, Departamentos: Servicio Geológico Nacional. (Accessed July 30, 2012, at <http://www.sgn.gov.do/index.php>.)
- Tauler, Esperanza, Proenza, J.A., Gali, Salvador, Lewis, J.F., Labrador, Manuel, Garcia-Romero, E., Suarez, M., Longo, F., and Bloise, G., 2009, Ni-sepiolite-falcondoite in garnierite mineralization from the Falcondo Ni-laterite deposit, Dominican Republic: *Clay Minerals*, v. 44, p. 435–454.
- Xstrata plc, 2011, Mineral resources & ore reserves as at 31 December 2011: London, United Kingdom, Xstrata plc, 46 p.

HAITI

In 2011, Haiti's GDP increased by 5.6% compared with a decrease of 5.4% in 2010. Positive growth had been expected because the country's capital and economic center, Port au Prince, had been devastated in January 2010 by a 7.0 magnitude earthquake, but economic growth in 2011 was hindered in part by delayed starts to major construction projects and political disruptions related to elections in the country in 2010 and 2011. The mineral industry contributed just 0.13% to the value of the country's GDP in 2011 (Institut Haitien de Statistique et d'Informatique, 2011).

Reference Cited

- Institut Haitien de Statistique et d'Informatique, 2011, Les comptes économiques en 2011: Institut Haitien de Statistique et d'Informatique, 1 p.

TABLE 1
DOMINICAN REPUBLIC AND HAITI: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Country and commodity	2007	2008	2009	2010	2011
DOMINICAN REPUBLIC ²					
Cement, hydraulic	4,077,337 ^r	4,206,612 ^r	3,852,176 ^r	4,105,657 ^r	3,996,500
Copper, mine output, Cu content	--	--	11,500	9,000	11,700
Gold, mine output, Au content kilograms	--	--	173	494 ^r	490
Gypsum cubic meters	146,287 ^r	177,982 ^r	67,928 ^r	53,800 ^r	70,000 ^e
Nickel, Ni content:					
Mine output, laterite ore	4,062,530	31,300	500	--	1,143,000
Metal, Ni contained in ferronickel, smelter	29,130	18,782	--	--	13,498
Petroleum, refinery products: ^e					
Liquefied petroleum gas thousand 42-gallon barrels	500	500	500	500	500
Gasoline, motor do.	3,447 ^{r,3}	3,277 ^{r,3}	3,000	3,000	3,000
Kerosene do.	100	100	100	100	100
Jet fuel do.	1,900	1,900	1,900	1,900	2,000
Distillate fuel oil do.	2,900	2,900	2,900	2,900	3,000
Residual fuel oil do.	4,600	4,600	4,600	4,600	5,000
Total do.	12,000	12,000	13,000	13,000	13,600
Sand:					
Silica cubic meters	11,445	9,600	4,000	5,300	NA
Unspecified do.	222,603	113,770	229,478	76,863	NA
Silver, mine output, Ag content kilograms	--	--	450	20,300	18,300
Stone, marble do.	53,069	78,668	4,970	5,557	6,000
HAITI ^e					
Cement	290,000	290,000	290,000	NA	NA
Sand:					
Silica cubic meters	450,000	450,000	450,000	NA	NA
Unspecified do.	2,000,000	2,000,000	2,000,000	NA	NA
Stone, marble do.	131	131	131	NA	NA

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. NA Not available. -- Zero.

¹Table includes data available through July 25, 2012.

²In addition to the commodities listed, the Dominican Republic also produced clays, crude steel, ferroalloys, lime, limestone, marble, sand and gravel, and salt (marine), but available information is inadequate to make reliable estimates of output.

³Reported figure.

TABLE 2
DOMINICAN REPUBLIC: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Copper	Perilya Ltd. (Zhongjin Lingnan Nonfemet Co. Ltd., 53.37%)	Bonao	15,000
Gold kilograms	do.	do.	600
Nickel	Falconbridge Dominicana C. por A. (Xstrata plc, 85.3%; Government, 10%; Franco-Nevada Corp., 4.1%; private interests, 0.8%)	do.	29,000
Petroleum, refinery	Refinería Dominicana de Petróleo S.A. (Government, 50%, and Shell International Petroleum Company Ltd., 50%)	Haina Port	34,000
Silver kilograms	Perilya Ltd.	Bonao	15,000
do. ditto.			