



# 2012 Minerals Yearbook

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## MOROCCO AND WESTERN SAHARA

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# THE MINERAL INDUSTRIES OF MOROCCO AND WESTERN SAHARA

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## MOROCCO

Morocco's geology has been subdivided into four structural domains or provinces. These are, from the south of the country to the north, the Anti-Atlas domain, the Meseta domain, the High Atlas domain, and the Rif domain. Morocco is rich in mineral deposits. The Anti-Atlas domain contains occurrences of manganese, precious metals (gold and silver), and strategic metals (cobalt, tin, titanium, and tungsten). The High Atlas domain (the Atlas Belt) contains occurrences of barite, copper, iron, lead, manganese, and zinc. The Rif domain contains occurrences of base metals and industrial minerals (Office National des Hydrocarbures et des Mines, 2012b).

Natural gas and petroleum were thought to occur in Morocco on the offshore Atlantic Margin; however, no significant discoveries had been reported by 2012. According to the Government's Office National des Hydrocarbures et des Mines (ONHYM), the Atlantic Margin of Morocco has not had any significant exploration drilling activity for natural gas and petroleum; a total of 50 wells (42 onshore and 8 offshore) had been drilled as of yearend 2012. ONHYM reported, however, that about 39 exploration drilling projects had been planned for 2013 on both onshore and offshore permits (Office National des Hydrocarbures et des Mines, 2012c).

Although Morocco had a long mining history, an established infrastructure, and a low sovereign risk, its mineral resources were relatively unexplored compared with many other countries in Africa. Since 1921, only about 20% of the country had been geologically mapped and only about 16% of the country was covered by exploration and mining permits. In 2012, the ONHYM had several mineral projects ongoing. These included projects in cooperation with Kasbah Resources Ltd. of Australia, Managem S.A. of Morocco, Maya Gold and Silver Inc. and Metalex Ventures Ltd. of Canada, and the Tolsa Group of Spain (Office National des Hydrocarbures et des Mines, 2012a; Terrapinn.com, 2012, p. 5).

The Government announced that it planned to start formulating a new mining law in 2013 that would overhaul the mining rules that had been in effect for more than 60 years. The new law was intended to attract investors, boost exports, and help ensure that companies respect the Government's labor and environmental laws. The new law was to be the first step of a national strategy that was aimed at increasing the role of the mining sector in the economy. Mining activities, excluding phosphate rock, contributed less than 1% of the country's \$100 billion gross domestic product (GDP) in 2012; phosphate rock accounted for about 5% of the GDP. A draft of the new mining law would be submitted to a council of ministers for review, and, after that review is completed, the draft would be submitted to the Parliament for review and approval (Karam, 2012).

## Minerals in the National Economy

Morocco, which borders the Atlantic Ocean and the Mediterranean Sea, was home to about 90 mining companies that produced about 20 different minerals. The estimated value of the mineral sector in 2012 was \$1.4 billion. The diversity and value of mineral production enabled the Moroccan mineral sector to play an important role in the national economy (about 6% of the country's GDP). Morocco's mineral sector was the leading foreign exchange earning sector for the Government, and the phosphate rock industry continued to be a major source of those export earnings. Morocco was the world's third-ranked producer of phosphate rock after China and the United States (Jasinski, 2013).

Morocco hosts several significant deposits, including Bou-Azzer, which was the world's only deposit where cobalt was mined as a primary product, and the Igoudrane and the Imiter deposits, which host significant silver resources. The phosphate rock deposits owned by the Government through the Office Chérifien des Phosphates [Office of Moroccan Phosphates] (OCP) contained a significant amount of the world's estimated phosphate reserves (Business Monitor International, 2012).

## Government Policies and Programs

The Government agency responsible for oversight of the mineral industry is the Ministère de l'Industrie, du Commerce, de l'Energie et des Mines [Ministry of Industry, Trade, Energy, and Mines]. The ONHYM is the primary agency responsible for the exploration and promotion of national mineral resources. The ONHYM was created by the merger of the Bureau de Recherches et de Participations Minières [Office of Research and Mining Investments] and the Office National de Recherches et d'Exploitations [Office of Research and Development]. All minerals are the property of the Government, which issues permits and licenses for the exploration and exploitation of the mineral resources. Mining legislation is based on the Mining Code Bill No. 1-73-412 of August 13, 1973, and is enforced through executive orders and the Directorate of Mines. The Office National de Recherches et d'Exploitations Pétrolières (ONAREP) [Office of Research and Petroleum Exploitation] is responsible for overseeing the energy sector (MBendi Information Services (Pty) Ltd., 2012c).

## Production

In terms of the value of production, phosphate rock was Morocco's most important mineral commodity and accounted for the majority of the country's mining output value. In addition to phosphate rock, the country produced a wide range

of minerals that included barite, clays, cobalt, copper, fluorspar, iron ore, lead, salt, silver, talc, and zinc.

In 2012, Morocco produced 14% of the world's output of phosphate rock, 7% of the world's production of barite, 2% of the world's production of cobalt, and 1% of the world's production of fluorspar. Production of crude steel, manganese ore, and primary lead increased, whereas production of arsenic, cobalt concentrate, and mercury decreased (table 1) (Jasinski, 2013; Miller, 2013a, b; Shedd, 2013).

### Structure of the Mineral Industry

There was little change in the structure of the mineral industry in 2012. Mineral production continued to be dominated by the private sector, with the exception of phosphate rock, which was a state monopoly. Table 2 is a list of major mineral industry facilities, their capacities, and their locations.

### Mineral Trade

Morocco's trade was based on various free trade agreements that the country had signed with its trading partners. The EU and the United States were Morocco's major trade partners. U.S. exports to Morocco were valued at about \$2.2 billion in 2012. This total included, in order of value, \$380 million for fuel oil, \$265 million for coal and other fuels, \$61 million for petroleum products, \$46 million for metallurgical-grade coal, and \$46 million for natural gas liquids (U.S. Census Bureau, 2012a).

U.S. imports from Morocco were valued at about \$932 million in 2012. This total included, in order of value, \$285 million for sulfur and nonmetallic minerals, \$125 million for other gemstones (precious, semiprecious, and imitation), \$20 million for other precious metals, and \$5 million for finished metal shapes, except steel (U.S. Census Bureau, 2012b).

### Commodity Review

#### Metals

**Cobalt.**—More than 215 minerals have been identified from the Bou-Azzer mining district, of which the cobalt and nickel minerals were of the most interest. The significance of the Bou-Azzer deposit is mainly in its unusual geology and mineralogy. The cobalt-nickel deposits are associated with arsenic in narrow vein structures found at the contact of a serpentine and quartz-rich diorite and Precambrian volcanic rocks. The serpentines are the major source rock for cobalt. The cobalt-nickel ore has undergone phases of brecciation and phases of recrystallization related to late Pan-African and Hercynian orogenies, which produced the various shapes of the ore bodies: flat lenses, lodes, stockworks, and veins. The total Bou-Azzer deposit is composed of about 60 ore bodies, all of which are spatially associated with serpentines of a Neoproterozoic ophiolite sequence in contact with propylitized quartz diorite and sedimentary and volcanoclastic rocks (Ahmad, Arai, and Ikenne, 2009).

Compagnie de Tifnout Tighanimine Managem S.A. (CTT Managem) was a subsidiary of Société Nationale d'Investissement [National Investment Co.] and specialized

in the evaluation of cobalt deposits and the production of cobalt. CTT Managem continued to mine cobalt ore at the Bou-Azzer underground mine located 42.5 kilometers (km) south of Ouarzazate in southern Morocco in the central Anti-Atlas Mountain range. In 2012, Morocco was the only country in which cobalt was mined from arsenide ores as a primary mineral commodity (CorporateInformation.com, 2012)

**Gold.**—In 2012, Maya Gold and Silver Inc. of Canada held both exploration and exploitation licenses for its Amizmiz project. The main objective of the licenses for Amizmiz was to evaluate high-grade gold areas in the company's 80-square-kilometer (km<sup>2</sup>) exploration permit in southwestern Marrakech Province. Maya Gold and Silver confirmed that the property has polymetallic gold-bearing veins in multiple zones. Drilling was continuing at Amizmiz and was focused on the AZ and TRN zones in order to better define the information in the National Instrument (NI) 43–101 report, which stated that the estimated inferred resource was 819,800 t grading 12.98 grams per metric ton (g/t) gold. The NI 43–101 report stated that the estimated inferred resource did not have demonstrated economic viability in 2012 (Maya Gold and Silver Inc., 2012).

The Tamlalt gold project of Kasbah Resources Ltd. of Australia is located at the eastern end of the High Atlas Mountains about 300 km south of Oujda. The Tamlalt property consists of eight exploration permits that covered an area of 128 km<sup>2</sup>. Diamond drilling has shown that the morphology of the Tamlalt deposit consists of a quartz vein system developed within a folded chlorite-sericite-altered porphyritic intrusive body. Within the 400 m of strike length that had been drill-tested in 2012, gold mineralization had been intersected to within 12 m of the surface to a maximum depth of about 300 m (Kasbah Resources Ltd., 2012c).

**Silver.**—In terms of value, silver was the second most valuable mineral commodity in Morocco after phosphate rock. Silver occurs both as the primary metal in ore deposits and as a byproduct in cobalt, copper, lead, and zinc deposits. The Imiter and the Igoudrane silver mines were located in the Anti-Atlas region, and both were owned by Société Metallurgique d'Imiter. The Imiter Mine had a processing capacity of about 300,000 metric tons per year (t/yr) whereas the Igoudrane Mine had a processing capacity of about 500,000 t/yr (table 2).

Maya Gold and Silver held exploration and exploitation licenses for five properties, among which were the Boumadine Mine and the Zgounder Mine. The Boumadine Mine, which is located in western Morocco near Tinejad, had an estimated historical (1992) polymetallic reserve of 4 Mt grading 3.8% zinc, 1.5% lead, 200 g/t silver, and 3.5 g/t gold. The Zgounder Mine, which is located 150 km south of Marrakech, had an estimated historical (2004) reserve of 582,000 t at an average grade of 361 g/t silver. The mine also had an estimated additional 500,000 t of tailings at an average grade of 125 g/t silver. The re-opening of the Zgounder Mine by midyear 2014 was expected to produce about 2,380 kilograms per year (kg/yr) of silver (Chadwick, 2013).

**Tin.**—The Achmmach project of Kasbah Resources Ltd. of Australia was located in the El Hajeb region in the Central Hercynian Massif about 140 km southeast of Rabat. In 2012, Kasbah Resources acquired 100% of the rights to Achmmach

and was continuing with development of the project, which was composed of two exploitation permits, PE 2912 and PE 193172; together, the two permits covered a 32-km<sup>2</sup> area. Kasbah's strategy was to increase the size of the deposit's resource, prove the economic viability of the project, and advance Achmmach to a development decision. The Achmmach project represented one of the leading undeveloped tin deposits in the world (Kasbah Resources Ltd., 2012a).

The Bou El JaJ project (BLJ) is located about 15 km from the Achmmach project and is the southernmost extension of a mineralized corridor that is about 2.5 to 3 km wide and nearly 12 km long in strike. BLJ had a strong surface geochemical signature for tin with outcropping tin mineralization evident along 2,100 m of strike length. A core drilling program was initiated in late 2012 (Kasbah Resources Ltd., 2012b).

### ***Industrial Minerals***

**Phosphate Rock.**—Phosphate rock is found mainly in the western part of Morocco. The Government's OCP was the country's sole producer of phosphate rock, most of which was exported. Higher revenues from the export of phosphate rock and its manufactured products helped the Government slow the annual increase in the trade deficit. Morocco hosts about 75% of global phosphate reserves, including deposits in the disputed Western Sahara region. OCP had committed to investing up to \$5 billion during the next decade to develop the infrastructure for new mines and wash plants. Also, the Government was making significant investments to shift the industry more toward beneficiation and fertilizer production (Wellstead, 2012).

OCP, which was one of the world's leading exporters of phosphate rock, announced that it planned to increase production to 50 million metric tons per year by 2020. The company was responsible for the production and sale of phosphate rock and manufactured phosphoric products at the Benguérir, the Khouribga, and the Youssoufia Mines in central Morocco and the Bou Craa Mine in Western Sahara. Also, OCP was developing the Jorf Phosphate Hub, which was a \$1.2 billion investment at Jorf Lasfar that is located about 125 km southwest of Casablanca. A 300-acre site had been set aside for phosphate processing plants, factories, and new harbor facilities to export phosphate-based products and storage warehouses (DBI Guide, 2012).

### ***Mineral Fuels and Other Sources of Energy***

Hydrocarbon occurrences in Morocco included a variety of liquid and gas accumulations, from dry gas in the Rharb basin and condensate and light oil in the Essaquiara and Preif basins, to heavy oil in the Tarfaya basin. The potential for hydrocarbon resources was thought to exist in large yet-to-be-explored sedimentary basins of Morocco. Morocco had a well-developed infrastructure to support natural gas and petroleum exploration and production. Exploration activities can be conducted year round [Mbendi Information Services (Pty) Ltd., 2012b].

**Petroleum.**—In 2012, the Government was dependent on natural gas and petroleum imports. The Government's energy strategy was to establish financial terms for hydrocarbon

exploration agreements that would attract investment in the hydrocarbon sector. Circle Oil Maroc Ltd., which was a wholly owned subsidiary of Circle Oil Plc of Ireland, signed an exploration and exploitation agreement with the ONHYM for the 296-km<sup>2</sup> Sebou concession in the Rharb basin for an initial exploration period of 8 years; the agreement could be renewed for up to 30 years after the initial 8-year period had expired (Circle Oil plc, 2012).

Chariot Oil and Gas Investments (Morocco) Ltd. announced that it had entered into an agreement with Maghreb Petroleum Exploration S.A. (MPE) whereby MPE would transfer its 75% ownership and operational interests in its two offshore licenses, Casablanca/Safi and Loukos, to Chariot. Upon approval, Chariot would hold a 75% interest and ONHYM would hold the other 25%. The Casablanca/Safi license is 1,925 km<sup>2</sup> in size and the Loukos license is 1,925 km<sup>2</sup> in size, with water depths ranging from 5 m to 165 m. Chariot was to reprocess the total 2,035 km of two-dimensional (2-D) seismic data from both licenses [MBendi Information Services (Pty) Ltd., 2012a].

In 2012, Morocco had 10 known oil shale deposits that contained an estimated 3.5% of the world's oil shale resources. The oil shale deposit at Tarfaya, which is the largest deposit in Morocco, contained an estimated 80 billion metric tons (Gt) of oil shale containing an estimated 22.7 billion barrels of oil in place. The oil shale deposit at Timahdit, which is the second largest deposit in Morocco, is composed of two basins; the Angueu and the El Koubbat synclines located 35 km south of Azrou in the Middle Atlas mountain area. In 2012, core drilling at the deposit had identified estimated reserves of 42 Gt of oil shale containing an estimated 15 billion barrels of oil in place (Office National des Hydrocarbures et des Mines, 2012b, p. 9).

**Renewable Energy.**—The Government's solar plan set the target of raising the contribution of renewable energy to 20% of national energy consumption by 2020. Siemens AG of Germany was to supply 44 wind turbines for two wind farms at Foum El Qued and at Haouma. Siemens would be responsible for the supply, installation, and commissioning of the wind turbines, each of which was rated at about 2.3 megawatts (MW); the farms had a combined capacity of about 100 MW (Stubben, 2012).

### **Outlook**

The Government is expected to continue to establish joint ventures with international companies, particularly in the natural gas and petroleum sectors. Also, Government policy is to increase the mining sector investments by both foreign and domestic minor and major mining companies. Further, the Government is expected to take steps to privatize selected state-owned mining assets and to launch reform programs within the mining sector to boost the sector's competitiveness. Lead, silver, and zinc output is expected to decline owing to depletion of reserves. Tin could prove to be a significant commodity for Morocco as Kasbah Resources continues to develop its tin resources. The OCP is expected to encourage foreign investment in the phosphate sector, and the phosphate industry will likely continue to dominate Morocco's mineral sector for the near future, while ONYHM will continue to support mineral development in other sectors.

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## WESTERN SAHARA

The issue of sovereignty for Western Sahara remained unresolved in 2012. The territory, a desert area bordering the Atlantic Ocean between Mauritania and Morocco, was contested by Morocco and the Saharawi Arab Democratic Republic (SADR) and the Polisario Front (Popular Front for the Liberation of the Saguia el Hamra and Rio de Oro), an independence movement based in Tindouf, Algeria. Western Sahara's economy continued to be dependent on fishing, pastoral nomadism, and phosphate mining.

In 2012, Western Sahara had the world's longest conveyor belt at the Bou Craa phosphate mines. The Western Sahara phosphate rock was moved by the conveyor belt for a distance of more than 100 km to the Port of El Aalun. The raw phosphate rock was offloaded to cargo vessels for transport to various countries where the phosphate is used in fertilizer production (Western Sahara Resource Watch, 2012).

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TABLE 1  
MOROCCO AND WESTERN SAHARA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2008	2009	2010	2011	2012 <sup>c</sup>
<b>METALS</b>					
Antimony, sodium antimonate <sup>c</sup>	500	400	400	400	450
Cobalt:					
Concentrates, gross weight	20,200	26,100	31,095	21,587	21,000
Co content	1,717	1,600	3,130	2,159	2,000
Metal <sup>4</sup>	1,791	1,600	1,545 <sup>r</sup>	1,788 <sup>r</sup>	1,314 <sup>3</sup>
Copper:					
Concentrates, gross weight	21,100	42,100	43,300	42,975	43,000
Cu content, concentrates	5,055	12,615	12,690	12,893	12,000
Gold kilograms	587	600	650	520	500
Iron and steel:					
Iron ore:					
Gross weight	22,900	30,500	44,665	78,926	80,000
Fe content (54%)	12,366	16,470	24,119	42,620	44,000
Metal:					
Pig iron <sup>c</sup>	15,000	15,000	15,000	15,000	15,000
Steel, crude	478,000	479,000	455,000	460,000	475,000
Lead:					
Concentrate:					
Gross weight	50,000	47,800	46,373	43,821	44,000
Pb content	33,477	27,000	32,461	30,675	30,000
Cuprous matte, Pb content <sup>c</sup>	600	600	600	480	500
Metal, refined:					
Primary	38,000	36,000	38,237	36,469	38,000
Secondary <sup>c</sup>	3,000	3,000	3,000	3 000	2,500
Total <sup>c</sup>	41,000	39,000	41,200	39,500 <sup>r</sup>	40,000
Manganese ore, largely chemical-grade	102,285	51,788	75,614	49,811 <sup>r,3</sup>	58,679 <sup>3</sup>
Mercury <sup>c</sup>	10	10	10	9	8
Nickel content of nickel sulfate	100	100	317	217	225
Silver, Ag content kilograms	201,195	235,301	243,000	186,000	200,000
Zinc concentrate:					
Gross weight	161,500	88,400	87,360	90,129	92,000
Zn content	80,747	44,199	43,680	45,065	46,000
<b>INDUSTRIAL MINERALS</b>					
Arsenic trioxide	8,000	8,655	13,731	8,154	7,000
Barite, crude	725,060	586,937	572,429	769,504 <sup>r</sup>	800,000
Cement, hydraulic thousand metric tons	14,047	14,519	14,000	14,000	14,500
Clays, crude:					
Bentonite	50,125	84,097	110,700 <sup>r</sup>	97,071	100,000
Fuller's earth (smectite)	140,875	132,110	82,570	103,682 <sup>r</sup>	100,000
Montmorillonite (ghassoul)	1,000	928	1,186	1,419	1,500
Feldspar <sup>c</sup>	28,000	28,000	-- <sup>r</sup>	43,889 <sup>3</sup>	45,000
Fertilizers <sup>c</sup> thousand metric tons	2,400	2,520	3,713 <sup>3</sup>	4,350 <sup>3</sup>	4,500
Fluorspar, acid-grade	56,724	69,091	75,380	79,207	80,000
Phosphate rock:					
Gross weight <sup>5</sup> thousand metric tons	24,861	18,307	26,603	28,052	28,000
P <sub>2</sub> O <sub>5</sub> content do.	8,000	6,000	8,500	9,200	9,000
Phosphoric acid do.	2,800	3,077	3,999	4,888	5,000
Pyrophyllite	25,800	33,400	27,066	5,129	5,200
Salt: <sup>5</sup>					
Rock	225,000	240,000	503,351 <sup>r</sup>	720,814	700,000
Marine	16,000	16,500	20,000	25,000	25,000
Total	241,000	256,500	523,351	745,814	725,000
Strontium minerals, celestite <sup>c</sup>	2,600	2,500	2,500	2,500	2,500
Sulfuric acid <sup>c</sup>	9,500	9,500	9,500	9,500	10,000
Talc	900	200	--	5,129	5,000

See footnotes at end of table.

TABLE 1—Continued  
MOROCCO AND WESTERN SAHARA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2008	2009	2010	2011	2012 <sup>e</sup>
MINERAL FUELS AND RELATED MATERIALS					
Gas, natural <sup>e</sup> million cubic meters	50	60	60	60	50
Petroleum:					
Crude thousand 42-gallon barrels	1,573	1,575	1,575	1,500	1,600
Refinery products:					
Liquefied petroleum gas do.	1,971 <sup>r</sup>	1,241 <sup>r</sup>	402 <sup>r</sup>	500 <sup>r,e</sup>	1,000
Gasoline do.	3,434	2,664 <sup>r</sup>	2,811 <sup>r</sup>	3,000 <sup>r,e</sup>	3,000
Jet fuel do.	2,096	2,054 <sup>r</sup>	3,249 <sup>r</sup>	3,000 <sup>r,e</sup>	3,000
Distillate fuel oil do.	13,554 <sup>r</sup>	10,329 <sup>r</sup>	16,827 <sup>r</sup>	14,000 <sup>r,e</sup>	14,000
Residual fuel oil do.	12,520 <sup>r</sup>	10,366 <sup>r</sup>	11,315 <sup>r</sup>	12,000 <sup>r,e</sup>	12,000
Other do.	7,735 <sup>r</sup>	6,023 <sup>r</sup>	13,396 <sup>r</sup>	12,000 <sup>r,e</sup>	12,000
Total do.	41,310	32,677	48,000	44,500 <sup>r,e</sup>	45,000

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits. <sup>r</sup>Revised. Do. Ditto. -- Zero.

<sup>1</sup>Table includes data available through August 31, 2013.

<sup>2</sup>In addition to the commodities listed, gypsum, perlite, and a variety of crude construction materials are produced, but information is inadequate to make reliable estimates of output.

<sup>3</sup>Reported figure.

<sup>4</sup>Cobalt electrowon from cobalt concentrates and tailings from the Bou-Azzer Mine.

<sup>5</sup>May include production from Western Sahara.

TABLE 2  
MOROCCO AND WESTERN SAHARA: STRUCTURE OF THE MINERAL INDUSTRIES IN 2012

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>MOROCCO</b>			
Arsenic trioxide	Compagnie de Tifnout Tighanimine Managem S.A. (CTT Managem) (Managem S.A., 55.2%, and Société Metallurgique d'Imiter, 20%)	Guemassa, Marrakech	10,000
Barite	Central d'Achat et de Développement de la Région Minière du Tafilalet et de Figuig (CADETAF) (artisanal miners)	Errachidia, Figuig, and Ouarzazate	16,000
Do.	Compagnie Marocaine des Barytes (COMABAR) [Norbar Minerals AS, 55%, and Office National des Hydrocarbures et des Mines (ONHYM), 45%]	Tlet Ighoud, Safi	160,000
Do.	do.	Zelmou, Figuig	110,000
Do.	Société Nord Africaine de Recherches et d'Exploitation des Mines d'Argana (SNAREMA)	Seksaoua, Marakech	120,000
Do.	Société Nouvelle Union des Metaux Maroc (SNUMM)	Jbel Abdellah, Errachidia	12,000
Barite, chemical grade	Société Nord Africaine de Recherches et d'Exploitation des Mines d'Argana (SNAREMA)	Argana	30,000
Bentonite	Société Minière Bentonite d'Afarha S.A. [Grupo Tolsa, 80%, and Office National des Hydrocarbures et des Mines (ONHYM), 20%]	Aferha	9,200
Do.	Société d'Exploitation des Mines du Rif (SEFERIF) [Office National des Hydrocarbures et des Mines (ONHYM), 100%]	Bou Hoed, near Ouixane	15,000
Do.	Compagnie Marocaine des Barytes (COMABAR) [Norbar Minerals AS, 55%, and Office National des Hydrocarbures et des Mines (ONHYM), 45%]	Azzouzet-Tidiennit	5,000
Do.	North African Industrial Minerals Exploration S.A.R.L. (S&B Group)	Trebia Mine	NA
Celestite	Société Karia Mines	Jbel Kifane, Taounate	NA
Cement, portland	Asment de Temara (Cimentos de Portugal S.A., 57.4%)	Kiln and mill at Temara	845,000
Do.	Société Lafarge Ciments S.A. (Lafarge Maroc, 69.2%)	Douar Laaouameur kiln and mill south of Casablanca	2,000,000
Do.	do.	Cadem clinker mill at Meknes	1,000,000
Do.	do.	Tamuda kiln and mill, Tetouan	800,000
Do.	do.	Kiln and mill at Tangier	250,000
Do.	Société Holcim (Maroc) S.A. (Holcim AG., 51%)	Kiln and mill at Oujda	1,000,000
Do.	do.	Settat kiln and mill	1,700,000
Do.	do.	Fes, Ras El Ma kiln and mill	1,200,000
Do.	do.	Fes, Doukkarat clinker mill	600,000
Do.	do.	Nador clinker mill	400,000
Do.	Ciments du Maroc S.A. (CIMAR) (Italcementi Group, 58.3%)	Kiln and mill at Agadir	1,220,000
Do.	do.	Kiln and mill at Marrakech	1,300,000
Do.	do.	Kiln and mill at Safi	850,000
Do.	do.	Laayoune clinker mill	350,000
Clay	Société du Ghassoul et de ses Derives SEFRIOUI SA	Tamdafelt	NA
Do.	Antonio Reyes Mines S.A.	Haddou Ammar, Nador	NA
Coal, anthracite	Charbonnages du Maroc [Bureau de Recherches de Participations Minières (BRPM), 98.89%]	Jerada	650,000
<b>Cobalt:</b>			
Ore, gross weight	Compagnie de Tifnout Tighanimine Managem S.A. (CTT Managem) [Société National d'Investissement, 81.75%]	Bou-Azzer Mine, 33 kilometers south of Ouarzazate	210,000
Metal	do.	Guemassa, Marrakech	2,500
Copper, concentrate	Société Minière de Bou Gaffer (SOMIFER) [Office National des Hydrocarbures et des Mines (ONHYM), 34.2%, Société Metallurgique d'Imiter, 36%; Managem S.A., 7.6%]	Bleida	50,000
Do.	Compagnie Minière de Guemassa (CMG) [Managem S.A., 74%, Office National des Hydrocarbures et des Mines (ONHYM), 23.08%]	Douar Hajar Mine, Guemassa, Marrakech	18,000
Do.	Société de Développement du Cuivre de l'Anti-Atlas (SODECAT) [Office National des Hydrocarbures et des Mines (ONHYM), 100%]	Tiout	4,500

See footnotes at end of table.

TABLE 2—Continued  
MOROCCO AND WESTERN SAHARA: STRUCTURE OF THE MINERAL INDUSTRIES IN 2012

(Metric tons unless otherwise specified)

Country and commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
MOROCCO—Continued				
Fluorspar, concentrate		Société Anonyme d'Entreprises Minières (SAMINE) (Managem S.A., 58%, and Société Metallurgique d'Imiter, 42%)	El Hammam, Khémisset	120,000
Gold		Akka Gold Mining Company [Managem S.A., 70%, and Office National des Hydrocarbures et des Mines (ONHYM), 16.07%]	Iourim, Tiznit	3
Iron ore	million metric tons	Société d'Exploitation des Mines du Rif (SEFERIF) [Office National des Hydrocarbures et des Mines (ONHYM), 100%]	Bouhoua, Nador	12
Concentrate		Compagnie Minière de Guemassa (CMG) [Managem S.A., 74%, and Bureau de Recherches de Participations Minières (BRPM), 23.08%]	Douar Hajar Mine, Guemassa	29,900
Do.		Compagnie Minière de Touissit (CMT) (Emerging Capital Partners, 50%, and Truffle Capital, 50%)	Touissit, Jerada	73,000
Metal <sup>1</sup>		Société des Fonderies de Plomb de Zellidja (SFPZ) (Zellidja S.A., 50.4%)	Oued El Heimer	70,000
Manganese, concentrate		Société Anonyme Chérifienne d'Etudes Minières (SACEM) [Bureau de Recherches de Participations Minières (BRPM), 43%, and Compagnie Minière de l'Ogooué SA (COMILOG), 30%]	Imini, Ouarzazate	14,000
Petroleum, refinery products	thousand 42-gallon barrels	Société Anonyme Marocaine de l'Industrie du Raffinage (SAMIR) (Group Corral Petroleum, 64.7%, and general public, 35.3%)	Mohammedia	47,000
Do.	do.	do.	Sidi Kacem	9,500
Phosphate rock		Office Chérifien des Phosphates (OCP) (Government, 100%)	Sidi Daoui Mine, Khouribga mining center	10,000,000
Do.		do.	Mera El Arech Mine, Khouribga mining center	6,000,000
Do.		do.	Benguérir open pit mine, Gantour mining center	4,000,000
Do.		do.	Youssoufia underground mine, Gantour mining center	3,000,000
Do.		do.	Sidi Chennane Mine, Khouribga mining center	2,000,000
Phosphoric acid, P <sub>2</sub> O <sub>5</sub> content		Indio Maroc Phosphore S.A. [Office Chérifien des Phosphates (OCP), 50%, and K.K. Birla Group, 50%]	Jorf Lasfar	330,000
Do.		Office Chérifien des Phosphates (OCP)	Maroc Chimie I and II, Safi	270,000
Do.		do.	Maroc Phosphore I and II, Safi	1,100,000
Do.		do.	Maroc Phosphore III and IV, Jorf Lasfar	1,400,000
Phosphoric acid (purified), P <sub>2</sub> O <sub>5</sub> content		Euro-Maroc Phosphore Co. [Office Chérifien des Phosphates (OCP), 33%; Société Chimique Prayon-Rupel, 33%; Chemische Frabrik Budenheim KG, 33%]	Jorf Lasfar <sup>2</sup>	120,000
Salt:				
Rock		Société de Sel de Mohammedia (SSM) [Office National des Hydrocarbures et des Mines (ONHYM), 100%]	Ain Tekki, Mohammedia	226,500
Marine		Société Chérifienne des Sels (SCS) [Government, 50%, and Société Nouvelle des Salins du Sine Saloum (SNSSS), 50%]	Lac Zima, Safi	30,000
Silver, ore	thousand metric tons	Société Metallurgique d'Imiter (SMI) (Managem S.A., 75.72%, and general public, 24.28%)	Imiter and Igoudrane Mines, Imiter	800
Do.		Maya Gold and Silver Inc. (Maya Gold and Silver Inc., 85%, and Office National des Hydrocarbures et des Mines (ONHYM), 15%)	Zgounder Mine, south of Marrakech	NA
Steel products:				
Bars and sections		Société Nationale de Sidérurgie (Sonasid) (general public, 31.14%; Société Nationale d'Investissement S.A., 21.07%; Axa Assurances Maroc, 8.53%; Aceralia Redendos, 8.5%)	Jorf Lasfar	300,000
Rebar and wire rod		Univers Acier S.A.	Casablanca	1,000,000
Do.		do.	do.	80,000
Cold-rolled sheet		Maghreb Steel S.A.	do.	250,000

See footnotes at end of table.

TABLE 2—Continued  
MOROCCO AND WESTERN SAHARA: STRUCTURE OF THE MINERAL INDUSTRIES IN 2012

(Metric tons unless otherwise specified)

Country and commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>MOROCCO—Continued</b>			
Talc and pyrophyllite:			
Pyrophyllite	Société Industrie Minière Marocaine (IMM)	Khenifra	NA
Talc	Société Zenaga	Tinjdad, Errachidia	NA
Do.	do.	Taliouine, Ouarzazate	NA
Zinc, concentrate	Compagnie Minière de Guemassa (CMG) [Managem S.A., 74%, and Office National des Hydrocarbures et des Mines (ONHYM), 23.08%]	Douar Hajar Mine, Guemassa	170,000
Do.	do.	Draa Sfar	NA
Do.	Société des Mines de Tennous (SOMITE)	Aguerd N'Tazoult, Azilal	NA
Do.	Société Mineral et Substances	Lalla Mimouna, Taza	NA
<b>WESTERN SAHARA</b>			
Phosphate rock	Phosphates de Bou Craa S.A. [Office Chérifien des Phosphates (OCP), 65%]	Open pit mine, Bou Craa mining center	2,000,000

Do., do. Ditto. NA Not available.

<sup>1</sup>Société des Fonderies de Plomb de Zellidja also refines silver and produces copper matte and sodium antimonate.

<sup>2</sup>A second purified phosphoric acid plant with a capacity of 120,000 metric tons per year was under construction in 2012.