

# THE MINERAL INDUSTRY OF MOROCCO AND WESTERN SAHARA

By Bernadette Michalski<sup>1</sup>

Morocco and Western Sahara was the world's second largest producer of phosphate rock, following the United States. The nation also had a significant capacity for conversion of phosphate rock into downstream chemicals. Other mineral production included anthracite coal, antimony, barite, cobalt, copper, fluorspar, gold, iron ore, lead, manganese, salt, silver, and zinc. The mineral industry was Morocco's largest foreign-exchange-earning sector and usually accounts for about 35% of foreign trade and about 6% of the gross domestic product.

Although Morocco produced a variety of minerals (table 1), it was phosphate rock and fertilizers production that remain significant on a global scale.

Morocco was the world's foremost exporter of phosphate rock and phosphoric acid; Spain, the United States, and Mexico were the principal phosphate markets by order of volume. Phosphate exports accounted for nearly 31% of Morocco's total exports. Other mineral exports included copper, iron ore, lead, and zinc.

The major mineral commodity import continued to be crude oil and petroleum products. Morocco imports more than 90% of its energy needs. The principal source for imported crude oil was Nigeria and Saudi Arabia. The Islamic Development Bank was the source for financing oil imports (Arab Petroleum Research Center, 1999, p. 281). Algeria was the principal source for liquefied petroleum gas. Other imported mineral commodities included sulfur and coal.

The mining industry of Morocco is controlled by the Government, specifically the Directorate of Mines, which is a department in the Ministry of Energy and Mines. The Directorate of Mines is charged with the interpretation and application of the national mining policy. The Directorate also controls the various parastatals and public companies involved in the mining industry. The state's interests in metal and industrial mineral enterprises are represented by the Bureau de Recherches et de Participations Minières (BRPM). Established in 1928, the BRPM is an autonomous public corporation involved directly or indirectly in the majority of all Moroccan mining enterprises, excluding hydrocarbons and phosphate. Founded in 1920, the parastatal Office Cherifien des Phosphates (OCP) manages and controls phosphate mining. OCP controls all aspects of the phosphate industry in Morocco, including research, exploitation, and the production of derivative products, such as fertilizers. Created in 1960, La Centrale d'Achat et de Développement de la Région Minière de Tafilalet et de Figuig (CADETAF) promotes the working of artisanal mines of barite, lead, and zinc in the regions of Figuig and Tafilalet. CADETAF provides technical, commercial, and social assistance to the artisanal miners. The Government parastatal that controls hydrocarbon exploration and production

is the Office National de Recherches & d'Exploitations Pétrolières.

In the interest of privatization, Government holdings have been successfully reduced, particularly in petroleum refining and metal mining operations. Omnium Nord Africain (ONA), the largest private company in Morocco, acquired much of the Government equity offered for privatization. ONA's mining subsidiary, Pole Mines, was involved in seven significant Moroccan mining ventures. Pole Mines' equity ventures included Compagnie Minière de Guemassa's the Douar Hajar lead mine, the Société Minière de Bou Gaffer's (SOMIFER) Bleida copper mine, the Compagnie de Tifnout Tiranimine's (CTT) cobalt mine at Bou Azzer, the Société Anonyme d'Entreprises Minières's (SAMINE) Meknes fluorite mine; Akka Gold Mining Company's Iourim gold mining venture, Soc. Metallurgique d'Imiter's (SMI) silver mine at Imiter, and Omnium Nord Africain's zinc mine and plant at Guemassa. (See table 2.)

Odyssey Resources of Canada, in agreement with the BRPM, explored for copper 500 kilometers (km) south of Rabat near Alous. The company will carry out all reconnaissance work in the area and will have an acquisition option allowing the company to gain control of properties that return encouraging results (Mining Magazine, 1998).

At the close of 1998, 16 petroleum exploration licenses were in force with 8 foreign companies—Cabre Exploration Ltd. of Canada, Enterprise Oil Exploration plc of the United Kingdom, Lasmo Overseas Nederland (II) B.V., Roc Oil Co. of Australia, Shell Prospecting Africa B.V., Skidmore Energy Inc. of the United States, Taurus Petroleum AB of Sweden, and Vanco Energy Co. of the United States (Middle East Economic Digest, 1998).

Morocco's crude oil production was negligible, but the domestic consumption rate was steadily rising. Crude oil and petroleum product import costs were approximately \$500 million<sup>2</sup> in 1998, down from nearly \$1 billion in the previous year because of lower oil prices. In 1998, Corral Petroleum AB purchased majority holdings in the 26,000-barrel-per-day (bbl/d)-capacity Sidi Kacem refinery, and in 1997, the 129,000-bbl/d-capacity Mohammedia refinery. Corral, a Swiss-based Saudi Arabian company, pledged to spend \$500 million on renovating and expanding the two refineries. A new company was formed in mid-1998, Corral Morocco Saudi Co., with the purpose of merging the two refineries under that company (Arab Petroleum Research Center, 1999, p. 279).

In 1998, reserves of phosphate rock totaled 85.5 billion metric tons; coal, 17.5 million metric tons (Mt); copper, 8.4 Mt; lead, 23 Mt; and zinc, 8 Mt. Crude oil reserves were reported at 1.95 billion barrels and natural gas at 1.4 billion

<sup>1</sup>Decased.

<sup>2</sup>Where necessary, values have been converted from Moroccan dirhams (DH) to U.S. dollars at a rate of DH9.86=US\$1.00.

cubic meters. Oil shale reserves were estimated to be 100 billion tons (Arab Petroleum Research Center, 1999, p. 278).

The railroad network in Morocco totaled 1,893 km of 1.435-meter standard-gauge single track. The highway infrastructure totaled 59,198 km, of which 27,740 km was paved. Crude oil and natural gas pipelines totaled 362 km and 241 km, respectively. Morocco's merchant marine fleet comprised 51 ships totaling 487,479 deadweight tons. Of these ships, 3 were petroleum tankers, and 11 were chemical tankers. The major Moroccan ports were Agadir, Casablanca, Jorf Lasfar, Kenitra, Mohammedia, Nador, Safi, and Tangier. The nation's electrical generation capacity was 3,700 megawatts (MW), but the nation planned to increase capacity to 5,574 MW by 2000.

Improving the country's infrastructure, including power generation and transmission, port capacity, and transportation, is a top priority of the Government. Funds for this improvement have recently become available through the transfer of resources from the public sector to the private sector. The Government also signed several agreements with the European Union (EU) on economic cooperation, including the establishment of a free trade zone for industrial goods for a 12-year transition period. The availability of additional capital through membership in the EU will provide further help to bolster the economy.

### References Cited

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### Major Sources of Information

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### Major Publication

Ministère de l'Énergie et des Mines, Direction des Mines  
Activité du Secteur Minière 1998, Rabat, Morocco, May 1999.

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

(Metric tons unless otherwise specified)

Commodity 2/	1994	1995	1996	1997	1998
<b>METALS</b>					
Antimony concentrate:					
Gross weight	523	442	345	350 e/	350 e/
Sb content	235	198	152 e/	160 r/	160 e/
Cobalt concentrate:					
Gross weight	3,810	4,885	5,033	7,137	2,874
Co content	419	537	565	722	230 e/
Cobalt recovered from tailings	--	--	80	220 e/	220 e/
Copper:					
Concentrates, gross weight	36,010	35,952	37,623	37,344	26,780
Matte, gross weight	1,689	1,933	1,671	2,682	2,841
Cu content, concentrates and matte	14,000	14,100	14,550	15,400	8,200
Gold e/ kilograms	565 3/	580	482 3/	450	450
Iron and steel:					
Iron ore:					
Gross weight	63,517	47,192	11,842	11,965	5,685
Fe content	39,380	31,518	8,257	8,260 e/	3,900
Metal: e/					
Pig iron	15,000	15,000	15,000	15,000	15,000
Steel, crude	7,000	7,000	7,000	7,000	7,000
Lead:					
Concentrate:					
Gross weight	104,520	101,631	107,577	110,507	115,042
Pb content	73,160	67,708	71,667	77,056	79,300
Cupreous matte, Pb content e/	442 3/	500	500	500	600
Metal:					
Smelter, primary only	60,740	62,363	61,749	66,202	65,000 e/
Refined:					
Primary e/	60,700	59,763 3/	62,700	64,202 3/	60,929 3/
Secondary e/	2,040 r/	2,600	3,100 3/	3,000	3,000
Total	62,740 r/	62,363	65,800	67,202	63,929
Manganese ore, largely chemical-grade	31,452	31,263	29,466	28,845	28,332
Silver:					
Ag content of concentrates and matte kilograms	68,500	22,000	19,304	35,000	65,000
Ag content of mine and smelter bullion do.	257,000	182,000	180,291	226,000	241,000
Total do.	325,500	204,000	199,595	261,000	306,000
Zinc concentrate:					
Gross weight	147,213	153,125	152,580	171,796	216,000
Zn content	76,800	79,947	79,662	89,248	112,000
<b>INDUSTRIAL MINERALS</b>					
Barite	264,526	289,308	282,537	338,096	353,438
Cement, hydraulic thousand tons	6,350 e/	6,401	6,585 r/	7,236 r/	7,200 e/
Clays, crude:					
Bentonite	24,919	29,308	39,680	49,633	47,881
Fuller's earth (smectite)	22,800	15,027	17,223	24,425	27,650
Montmorillonite (ghassoul)	3,329	3,311	3,169	2,933	3,180
Feldspar	1,000 e/	17,233	12,659	15,110	5,616
Fertilizers thousand tons	2,000	2,100	2,200 e/	2,200 e/	2,200 e/
Fluorspar, acid-grade	85,000	105,800	95,900	103,800	105,000
Gypsum e/	450,000	450,000	450,000	450,000	450,000
Mica e/	1,500	564 3/	600	600	600
Phosphate rock (includes Western Sahara):					
Gross weight thousand tons	20,375	20,684	20,855	23,084	23,587
P <sub>2</sub> O <sub>5</sub> content do.	6,580	6,399	6,552	7,848	7,850
Phosphoric acid do.	2,603	2,600 e/	2,583	2,600 e/	
Salt:					
Rock	142,258	137,910	138,290	210,000 e/	107,604
Marine	45,600	42,300	32,530	47,500 e/	40,000 e/
Talc and pyrophyllite	---	8,429	13,053	19,850	20,000

See footnotes at end of table.

TABLE 1--Continued  
MOROCCO AND WESTERN SAHARA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1994	1995	1996	1997	1998
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Coal, anthracite	650,400	649,600	505,600	376,300	269,100
Gas, natural:					
Gross million cubic meters	24	25 r/	22 r/	38 r/	43
Dry do.	22	22 r/	20 r/	35 r/ e/	38 e/
Petroleum:					
Crude thousand 42-gallon barrels	62 r/	36 r/	35	35	35
Refinery products: 4/					
Liquefied petroleum gas do.	3,300	2,800 r/	2,000 r/	2,489 r/	2,617
Gasoline do.	3,300	3,000 r/	3,000 r/	3,428 r/	3,548
Jet fuel do.	1,900	1,900 r/	2,000 r/	1,982 r/	2,544
Kerosene do.	390	300 r/	300 r/	481 r/	611
Distillate fuel oil do.	16,200	15,000 r/	14,000 r/	17,800 r/	16,667
Residual fuel oil do.	17,200	12,000 r/	10,000 r/	11,394 r/	12,766
Other do.	7,000	5,800 r/	5,000 r/	6,000	8,517
Total do.	49,290	40,800 3/	36,300 3/	43,574 r/	47,270

e/ Estimated. r/ Revised.

1/ Includes data available through December 1, 1999.

2/ In addition to the commodities listed, a variety of crude construction materials are produced, including, possibly, a substantial amount of limestone; information is, however, inadequate to make reliable estimates of output levels.

3/ Reported figure.

4/ Refinery fuel and losses have been included in the output of individual products and is estimated to be about 1.8 million barrels per year.

TABLE 2  
MOROCCO AND WESTERN SAHARA: STRUCTURE OF THE MINERAL INDUSTRY IN 1998

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Anthracite coal		Charbonnages du Maroc (CdM) (Bureau de Recherches et de Participations Minières (BRPM), 98.89%)	Jerada	650,000.
Barite		Compagnie Marocaine des Barytes (COMABAR) (BRPM, 22.5%; Norbar Minerals, 55%)	Zelmou Safi	150,000. 80,000.
Do.		Société Nord Africaine de Recherches et d'Exploitation des Mines d'Argana (SNAREMA)	Argana do.	30,000 chemical grade. 120,000.
Bentonite		Tolsa, SpA (Tolsa, 100%)	Iboughardain	20,000.
Do.		Société d'Exploitation des Mines du Rif (SEFERIF) (BRPM, 100%)	Ouizane- Bouhoua	15,000.
Do.		Compagnie Marocaine des Barytes (COMABAR) (BRPM, 22.5%; Norbar Minerals, 55%)	Azzouzet-Tidiennit	36,000.
Cement		Asment de Temara (Cimentos de Portugal, 57.4%)	Temara	830,000.
Do.		Lafarge Ciments (Société Nationale d'Investissement, 50%)	Casablanca Meknes Tangier	2,000,000. 1,000. 350,000.
Do.		Cimenterie de l'Oriental (CIOR) (Holderbank, 51%; private, 35%)	Oujda Fes	1,000,000. 700,000.
Cobalt		Compagnie de Tifnout Tiranimine (CTT) (Omnium Nord Africain (ONA), 55.2%; SMI, 20%)	Bou Azzer	150,000 ore. 50,000 concentrate.
Copper		Société Minière de Bou Gaffer (SOMIFER) (BRPM, 34.2%, SMI, 36%; ONA, 7.6%)	Bleida	50,000 concentrate.
Do.		Société de Développement du Cuivre de l'Anti-Atlas (SODECAT) (BRPM, 100%)	Tiouit	4,500 Cu, Au, Ag concentrate.
Fluorspar		Société Anonyme d'Entreprises Minières (SAMINE) ( ONA, 58%; SMI, 42%)	Meknes	120,000 concentrate.
Gold		Akka Gold Mining Company (ONA, 70%; BRPM, 30%)	Iourim	NA.
Iron ore	million metric tons	Société d'Exploitation des Mines du Rif (SEFERIF) (BRPM, 100%)	Nador	12.
Lead		Compagnie Minière de Guemassa (CMG) (ONA, 74%; BRPM, 26%)	Hajar	150,000 Zn concentrate. 32,000 Pb concentrate.
Do.		Compagnie Minière de Touissit (CMT) (Compagnie Royale Asturienne des Mines S.A., Belgium, 50%)	Touissit	73,000 concentrate.
Do.		Société de Développement Industriel et Minière (BRPM, 50%)	Zeida	40,000 concentrate.
Manganese		Société Anonyme Chérifienne d'Etudes Minières (SACEM) (BRPM, 43%; COMILOG, 30%)	Quarzazate	130,000 concentrate.
Petroleum refinery products	thousand 42 gallon barrels	Société Marocaine de l'Industrie du Raffinage (Corral Morocco Saudi Co., 100%)	Mohammedia	47,000.
Do.	do.	Société Chérifienne des Pétroles (SCP) (Corral Morocco Saudi Co., 100%)	Sidi Kacem	9,500.
Phosphate	million metric tons	Office Chérifien des Phosphates (OCP) (Government, 100%)	Youssoufia Benguerir Khouribga Sidi Chenan BouCraa	6 concentrate. 6 concentrate. 4 concentrate. 5 concentrate. 6 concentrate.
Salt, rock		Société de Sel de Mohammedia (SSM) ( BRPM, 100%)	Mohammedia	150,000.
Salt, marine		Société Chérifienne des Sels (SCS) (BRPM, 50%; SNSSS, 50%)	Zima	50,000.
Silver	kilograms	Société Metallurgique d'Imiter (SMI) (ONA, 67%; private, 20%; BRPM, 13%)	Near Quarzazate	210,000.
Steel rebar, wire rod		Société Nationale de Sidérurgie (SONASID) (private, 65%)	Nador	480,000.
Zinc		Omnium Nord Africain mine and plant (ONA, 100%)	Guemassa	265,000 concentrate.
Zircon		Agrupacion Minera de Investigaciones S.A.	Guelmin	NA.

NA Not available.