

# MOROCCO

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*Mineral Industry Intelligence & Information*

While mineral-based industries, agricultural exports, a well-organised tourist industry and manufacturing continue to support economic and social development in Morocco. However, about one third of the country's 29 million people remain below the poverty line, creating pressure for rapid progress in terms of general welfare and education. During 2000, an improved relationship with the European Union was a positive factor, while the drive for new mineral development continued. The 2001 budget calls for a healthy 8.1% increase in GDP with an inflation rate of only 2.5%.

On the other hand, steps taken to delay further the long-scheduled UN-organised self-determination referendum in the Western Sahara had some negative impact on Morocco's image. The government is understandably unwilling to risk losing earnings from the high-grade phosphate rock mined in the territory but now risks a resumption of guerrilla warfare by the Sahrawi independence movement. Already the cost of maintaining a large number of troops in the Sahara is a significant drain on resources. However, the government is reported to have prepared an alternative plan for the territory, involving a 10-year transitional period with some authority devolved to a Sahrawi council.

## **Mineral Development**

The importance of mining to the Moroccan economy cannot be understated: it accounts for 75-80% of exports in tonnage terms and 30-33% by value, contributing 70% of rail freight tonnage and 75% of seaborne export tonnage in the process. Although phosphate rock and intermediate phosphate materials are the most significant in terms of employment and exports, there are nevertheless more than 90 mining companies

producing 20 different mineral products and employing 47,000 people in total.

Convinced that presently unexploited mineral potential can maintain the mining industry's contribution to economic development in the future, the government is pursuing a national Mining Development Plan. This makes the Ministry of Energy and Mines responsible for basic geological information gathering and presentation, while the Bureau de Recherches et de Participations Minières (BRPM) manages mineral exploration. Once the potential viability of a mineral deposit has been demonstrated, BRPM hands over to private sector mining companies. Groupe OCP remains responsible for the crucial phosphate industry. Another government agency, CADETAF, promotes artisanal mining of lead, zinc and barytes in Tafilalet and Figuig.

During 2000, BRPM maintained the intensity and breadth of the mineral exploration effort, introduced more modern technology (notably, reverse circulation drilling) and cut the cost per drill metre, made progress with existing technology partners and formed five new partnerships with foreign organisations. A BRPM web site is under development.

Base metals exploration effort was focused on three main target types: volcanogenic massive sulphide (VMS) occurrences in central Jebilet, Guemassa, Jerada and Ezzhiliga; Mississippi Valley type (MVT) mineralisation linked to carbonate rock series in the western extension of the horst country of the Taourirt district; and vein mineralisation at various localities. The last included tin mineralisation at Achemmach and El Karit, hydrothermal occurrences at Aguelmous (lead-zinc-silver), and copper-bearing Upper Proterozoic formations in Tamgout, where further drilling is to be undertaken. At

Achemmach, BRPM is planning laboratory and pilot scale testwork before seeking tenders for the transfer of the deposit to the private sector, while work at El Karit is reaching the prefeasibility study stage. Within the framework of the BRPM – Cie. Minière des Guemassa (CMG) partnership, sulphides have been surveyed in nine districts using aeromagnetics, geological mapping, ground geophysics, deep electromagnetics and drilling. VMS-type polymetallic mineralisation grading 2.5% zinc is being drilled further. In the Guemassa area, the BRPM – Outokumpu partnership has drilled potentially interesting zinc-lead-copper-silver-gold mineralisation at Khwadra. The Taourirt MVT targets are being mapped by the BRPM – Japanese International Co-operation Agency (JICA) partnership.

Precious metals prospecting proceeded in 17 districts, five of which have been drilled. The most advanced study areas are Tizouine, Tizwat, Qalaat M’Gouna and Tamlalt, while several new targets have also been identified.

The major industrial minerals exploration project involves drilling for bentonite in the Nador and Taourirt regions. This work is being done within the partnership agreement with Spain’s TOLSA. Other significant activities within BRPM’s ongoing partnership programmes included the formation of Minière d’Afarha Bentonite SA (MABENSA) by TOLSA and BRPM (20%); training programmes provided by JICA; and the definition of copper targets by the partnership with Poland’s Centrum Badawczo Projectowe Miedzi (CUPRUM). BRPM completed the hand-over of two previously tendered opportunities to the private sector – the Nador bentonite deposits and the Bou Maadine polymetallic deposit. Tenders are still in progress for the previously worked Zgounder silver deposit and the Jebel Mahdi calcite deposit.

New co-operation agreements were signed with: the Geological Institute of Poland, the Polytechnic University of Madrid, UK mining

company Navan Resources, Italian firm Caolino Panciera, the Iran Itok company, and Metales Hispania. This Spanish firm will finance 70% of an exploration programme seeking polymetallics in the Marrakech region. An agreement with the ONA Group covering the Akka South district is under negotiation.

The downside of Morocco’s mineral trade balance is an almost complete reliance on imported fossil fuels. Charbonnages de Maroc mines anthracite at Jerada and there has been very limited production of oil and gas. However, Office National de Recherches et d’Exploitations Pétrolières (ONAREP) began a new drive to encourage exploration activity by suitably equipped companies in 1999 and during 2000 made significant progress. Not only did ONAREP sign exploration agreements with companies such as Lone Star from the US and a UK-US-South African consortium, but the interpretation of offshore seismic data by US consulting group IHS Energy enabled the Moroccan agency to organise roadshows in London and Houston during October. These were sufficiently successful that ONAREP held a ‘licensing round’ for eight blocks, and bidding was due to be completed by April 30, 2001. In March 2001 a South African-Swedish consortium was granted offshore permits.

### Metals Mining

During 2000 Managem, the mining arm of the ONA group (see *Mining Annual Review 2000*), reported excellent progress through 1999, such that the firm felt able to offer 25%

<b>Managem Metals (t except where stated)</b>		
	<b>1998</b>	<b>1999</b>
Cobalt - cathode	242	472
- concentrate	729	4,588
Copper	31,719	25,170
Gold ingot (kg)	53.25	372
Lead	35,635	35,140
Silver (kg)	240,412	226,642
Zinc	210,936	208,056

of its shares to the public in June 2000 in order to finance new investments. Major project progress during 1999 included the launch of the second CMBA cobalt cathode production unit, which has a capacity of 1,100 t/y; and commissioning of expanded process capacity at the Imiter silver operation. Construction and limited production started at the Akka 3 t/y gold project and in August 2000 Proparco, a branch of the French Development Agency, extended to Managem a US\$20 million loan to restructure the Akka project. Meanwhile, CMG prepared the Attic copper sulphate manufacturing unit at Guemassa for start up during 2000 and readied a gravity concentration circuit at SMI's Imiter mine. Longer-term investments included the acquisition of the Bou Maadine polymetallic deposit through the partnership convention with BRPM, plus new studies at the Kelaat M'gouna gold-bearing deposit and on the project to produce zinc-based products from calamine ore. Furthermore, exploration increased reserves at the active mines of CMG, SMI, Samine and CTT as well as at the former Somifer copper operation.

As regards production, the launch at CMBA II and development at Akka raised overall cobalt and gold output, while commissioning at SMI decreased total silver production. Following the sale of stocked material to China, CTT raised cobalt concentrate production in order to supply CMBA II's needs. At El Hajar, CMG adjusted production in line with market trends, reducing zinc and lead output slightly. Copper output fell quite sharply. The new cobalt and gold production, allied to zinc and copper dollar price improvement, a strengthening of the dirham/dollar parity and reduced operating costs, enabled Managem to increase turnover by 8% relative to 1998 and operating income by 19%.

Internationally, Managem acquired a 34% interest in Canadian firm SEMAFO, thus adding greater involvement in projects in Niger and Mali to continuing ventures in Burkina Faso, Guinea and Ivory Coast. The

Samira Hill gold project in Niger is scheduled to start up in the second half of 2001. The company also signed a convention with Niger and Ivory Coast covering joint research and exploration activities and has purchased a 72% interest in the Malian company Segala Mining from Canada's Oliver Gold.

Cie Minière de Seksaoua (CMS), the 50/50 joint venture between Anglo American and Soc. Nord Africaine de Recherches et d'Exploitation des Mines d'Argana (SNAREMA), continued pilot testwork and other studies intended to determine the feasibility of substantial copper production at Seksaoua.

In 1996 SNAREMA, best known as a barytes producer, installed a 150 t/d pilot copper flotation circuit and has been exporting the 28% copper concentrate. The CMS joint venture gives Anglo rights to explore 400 km<sup>2</sup> around Seksaoua and to complete a

<b>Moroccan Production ('000t)</b>			
	<b>Production</b>		<b>Exports</b>
	<b>1998</b>	<b>1999</b>	<b>1999</b>
<b>Minerals ('000 t)</b>			
Phosphates	22,644	22,163	11,382
Anthracite	269.10	129.20	n.a.
Iron Ore	9.3	6.63	1.43
Chemical manganese	28.33	29.15	26.15
Fluorspar	105.0	83.10	82.76
Salt	126.57	156.16	20.02
Barytes	353.2	328.95	208.50
Cobalt	2.87	9.49	2.56
Smectic clays	30.65	21.96	19.76
Feldspar		18.33	1.11
Bentonite	33.31	36.53	34.30
Pyrophyllite	22.57	11.68	n.a.
<b>Metals (t)</b>			
Cobalt cathode	242	472	464
Copper concentrates	31,720	25,260	27,420
Gold (kg)			372
Lead concentrates	115,060	114,200	46,880
Refined lead	61,953	65,210	56,110
Silver	306.5	278	265
Zinc concentrates	216,010	216,200	211,100

Source: FDIM

feasibility study. Should large-scale development then proceed, Anglo's stake would increase to 60%.

Other significant producing operations include Cie Minière de Touissit, which mines one lead ore and one silver-bearing lead-zinc ore deposit. Downstream there is the Soc. des Fonderies de Plomb de Zellidja (SFPZ) primary smelter at Oued el Heimer and the small secondary smelter owned by Soc. Africaine des Metaux et Alliages Blancs. SFPZ reportedly produced 60,000 t of lead in 2000, while SAMAB is estimated to have recovered 4,000 t of lead last year.

### Industrial Minerals

Groupe OCP is the world's largest exporter of phosphate rock and is also able to supply all the normally traded grades. Furthermore, mine production is sufficient that the higher grades can mainly be exported while the lower ones are converted to intermediate products that are also mainly exported for fertiliser industry use. This strategy for maximising the value of exports has increased the group's importance to the economy over and above the increase in mine production. The focus on exports is reflected in the decision by the Ministry of Privatisation and OCP to offer a further 30-40% of the shares in Fertima, which manufactures finished fertilisers from OCP intermediates at the Safi facility.

In order to continue meeting phosphate demand, OCP must make substantial

investments in new equipment for both surface and underground mining as well as for the washing, flotation and drying processes used to beneficiate run-of-mine ore. A detailed commentary on the group's progress in 2000 can be found in *Mining Annual Review* section covering phosphate rock.

Managem owns the fluorspar producer Samine, which was obliged to reduce output by 21% in 1999 as a result of previous delays in necessary infrastructure improvements. Other Moroccan contributors to world industrial mineral supply not previously mentioned include: SACEM – chemical manganese, the salt producers SCS and SSM, and the barytes miners COMABAR, SMBA, SNUMM and SOCOMIS. COMABAR also mines bentonite and SOCOMIS copper. SSM (Soc. Sel de Mohammedia) engaged the Canadian company Geostat Systems International to carry out a stability study of its rock-salt mine 35 km from Casablanca.

<b>Phosphate Products Output ('000 t)</b>			
	<b>1998</b>	<b>1999</b>	<b>2000</b>
Phosphate rock	22,644	22,163	21,628
Phosphoric acid	2,668	2,696	2,736
Triple superphosphate	542	485	630
Monoammonium phosphate	84	198	348
Diammonium phosphate	1,278	1,205	1,238
NPK fertilizers	206	200	195

Source: Groupe OCP