

## MAURITANIA

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**M**auritania is located in Western Africa. Its surface area is 1,085,000 km<sup>2</sup>. but it has a population of just 2.5 million. The Atlantic coast extends over a length of more than 700 km. The neighbouring countries are Morocco and Algeria to the north, Mali to the east and Senegal to the south.

For more than 40 years, Mauritania has been one of the major producers and exporters of iron ore in Africa. The iron-ore mines, located in the north of Mauritania, account for over 60% of the country's external trade balance. The mines belong to, and are operated by, Société Nationale Industrielle et Minière (SNIM), the world's seventh-largest iron-ore producer and exporter of iron ore.

In recent years, the Mauritanian Government has set up new institutions and rules, with a view to promote the mining sector. For example:

- rules pertaining to mining, oil production and investment have been thoroughly updated with the aim of encouraging investors and operators;
- profits generated in the country by foreign investors can be freely repatriated;
- exchange control regulations have been modified;
- an international arbitration board may be selected, in case of dispute; and
- the administrative steps required to obtain exploration and operating permits have been simplified.

As a result of these changes, direct investments have increased markedly, reaching US\$450 million in 2003, with 50% of the total directed towards the mineral and oil exploration sectors. There are now over 20 national and foreign companies involved in mineral exploration and include:

- SNIM, BHP Billiton and Sphere Investments for iron ore;
- SNIM, Defiance Mining, GGI, GMJV, WADI and BSA for base metals and gold;
- GMM, Idgeo and Segma for ornamental stone; and
- Sophosa for phosphate rock.

Apart from mining rights granted to SNIM (iron ore), Defiance (gold) and Wadi (copper), more than 70 exploration licences have been granted for gold, base metals, diamonds, ornamental stones, etc.

Within the remit of the first phase of the *Projet de Renforcement Institutionnel du Secteur Minier (PRISM-1)*, Mauritania has launched a major programme to update the country's geological database. This includes airborne geophysical surveys, geological mapping, and geochemistry. The total cost of this first phase has exceeded US\$18 million and has involved the participation of the Mauritanian Ministry of Mining and Industry through the *Direction des Mines et de la Géologie (DMG)* and the *Office Mauritanien de Recherche Géologique & Minière (OMRG)*, the *Bureau de Recherche Géologique et Minière (BRGM)* of France, the *British Geological Survey (BGS)* and two geophysics companies, *Fugro* and *Sanders*.

PRISM is being financed by the Mauritanian Government, the World Bank and the Islamic Development Bank, and the first phase has been confined to those areas considered to offer the greatest mineral potential, and located in the north and south of Mauritania. In April 2003, a new financing agreement was entered into by the Mauritanian Government and the World Bank, to cover PRISM's second phase. This includes hydrogeology and the total cost of this programme is US\$25 million. The World Bank has committed US\$15 million, with the remainder being contributed by the Mauritanian Government, the Islamic Development Bank, the European Union, the French Co-operation Agency, and the Japanese International Co-operation Agency.

PRISM-2 includes additional geophysical and geological surveys at a scale of 1:200,000 in the north of the country, an airborne geophysical survey in the Mauritanides in the centre and south and the synthesis and interpretation of the data already collected, in order to publish information that will attract greater investment in mining ventures. In line with the policy of promoting Mauritania's minerals sector, the number of applications for exploration licences for both metals and oil has already increased significantly.

### **Iron ore**

SNIM, 78% government owned, was created in 1975 by the nationalisation of *Mines de Fer de Mauritanie (Miferma)*, a company created in 1952 to exploit iron-ore deposits in the *Kedia d'Idjil* area of northern Mauritania. A mining centre was constructed at *Zouerate*, together with port facilities on the Atlantic coast at *Nouadhibou*, the two linked by a 700 km railway.

At *Kedia d'Idjil*, the deposits occur within the Archaean and Birrimian *Reguibat Shield* and comprise mostly haematite exposed at surface in ridges or 'guelbs'. At *Guelb Rhein* and *Oum Arwagen*, the ore is in the form of magnetite in much-folded sedimentary deposits. Richer ores can average 65% Fe, while siliceous ore averages nearer 55% Fe. Proven and probable reserves of direct shipping ore total 300 Mt, and reserves requiring beneficiation total nearer 3,000 Mt. Resources total 2,400 Mt.

There are three main mining areas and, together, they shift about 75 Mt/y of material. About 10-12 Mt/y of ore is produced and about half is processed at the mining area plants; the remainder at *Nouadhibou*. In 2003, SNIM shipped 10.4 Mt of product and about 60% was direct shipping grade (40% Fe

concentrates). Current production capacity is 13 Mt/y but output is governed by the railway. An expansion to 13.5 Mt/y capacity is under way.

The Australian company Sphere Investments Ltd has entered into a 50:50 JV with SNIM to develop the El Aouj iron-ore deposits, which are located within SNIM's concession and close to its existing mining operations. The JV would produce high-grade pellets for direct reduction, for sale preferably customers in North Africa and the Middle East, where energy is cheap. Reserves at El Aouj are estimated at 500 Mt and will support production of 5-7 Mt/y of pellets (70% Fe) over a span of 30 years. The feasibility study is expected to cost US\$11.0 million and the total capital cost about US\$650 million. Early in 2003, Kumba Resources of South Africa acquired an earn-in option, and in January 2004 African Lion agreed to part-fund the first stage of the bankable feasibility study.

### **Development projects**

In April this year, Defiance Mining Corp of Canada announced the completion of a bankable feasibility study for its 100%-owned Tasiast gold project in northern Mauritania. (Defiance was formed early in 2003 by the merger of St Barbara Mines and Geomaque Explorations, and acquired Australian-based Midas Gold plc and its Tasiast project.) The feasibility study was carried out by SNC-Lavalin and proven and probable reserves within four open pits are estimated at some 9 Mt averaging 3.06 g/t Au, based on a gold price of US\$370/oz. The mine is expected to process an average of 1.12 Mt/y of ore to produce 110,000 oz/y of gold for the first three years and 102,000 oz/y thereafter. The company has secured an exploitation licence and estimates the total capital cost, including mine, concentrator and CIL plant, at about US\$48 million. Mine construction is expected to take 18 months.

Wadi El Rawda Emirates, an Arabic firm, has purchased from the Mauritanian Government the assets of the former state-owned Samin. These assets include the copper, gold and cobalt mine, located near Akjoujt, some 250 km north of Nouakchott. The mine operated briefly in the 1970s and was closed in 1978, partly because of technical problems associated with the Torco upgrading process, and partly because of low copper prices. An estimated US\$185 million would be required to restart the mine.

Rio Tinto, De Beers and Rex Corp continued with their respective diamond exploration programmes and Rio Tinto collected a 25 t sample from one of its kimberlites.

### **Oil and gas**

During 2003, it was officially announced that oil reserves discovered off the coast near Nouakchott will be exploited and sales commenced by the end of 2005. Production at the rate of 75,000 bbl/d will be from the Chinguitti well where reserves are estimated at more than 180 Mbbbl. The discovery was the result of an offshore exploration programme initiated in 1998 and conducted by a consortium including: Woodside Petroleum, Hardman Co, EWI-AGIP and Dana Petroleum.

Other oil companies are present in Mauritania, and are carrying out onshore as well as offshore exploration. They include: Total, Brimax, IPG, Repsol and Belhassa International.

In addition, large natural-gas reserves have been discovered by Hardman in one of its wells. Based on a preliminary estimate, this well should be able to produce over 3 trillion cubic feet. Other wells will be drilled in 2004 by Hardman with a view to increasing reserves.

The cheap energy resulting from the discovery of natural gas and oil should bolster the mining sector in Mauritania: for example, it should facilitate production by SNIM of very high-grade pellets at a reasonable cost, and make viable the upgrading of the several billions of tonnes of low-grade iron within SNIM's concession, estimated at several billion tonnes. Cheaper energy would also enable the establishment of local service companies and manufacturers to supply the existing mines, and improve the economics of processing the abundant supply of brackish water in northern Mauritania to meet industrial demand.