

# THE MINERAL INDUSTRY OF

# MALI

By Philip M. Mobbs

Gold was the most economically significant mineral commodity produced in Mali during 1997. Production from the newly opened Sadiola Hill Mine propelled Mali to fourth on the list of African gold producers, after South Africa, Ghana, and Zimbabwe. Extensive gold exploration continued during the year in the Birimian Series greenstone belts in the southwestern and southern parts of the country near Bougouni, Kéniéba, and Sikasso. The country had a wide variety of other mineral deposits, but few have been developed because of the condition of the nation's transportation network and lack of local demand (United Nations, 1987; Abdrahamane Dicko, special correspondent, *Les Echos*, Société Express Bamako-Kayes—L'enfer roulant, March 27, 1998, accessed July 1, 1998, at URL [http://malinet.ml/palabre/presse/les\\_echos/pages/ecmars98/ec940soc1a.html](http://malinet.ml/palabre/presse/les_echos/pages/ecmars98/ec940soc1a.html)). Gold accounted for more than 95% of the estimated total value of mineral commodities produced in Mali. Gold exports increased to 18.5 metric tons (t) in 1997 compared with 6.6 t in 1996 (Mining Journal, 1998).

Mining was overseen by the Direction Nationale de Géologie et des Mines, which is part of the Ministère des Mines, de l'Énergie et de l'Hydraulique. The mining code included Decree No. 96-214/PM-RM of August 16, 1996, Ordonnance No. 91-065/P-CTSP of September 19, 1991, Decree No. 91-277/PM-RM of September 1991, and Decree No. 91-278/PM-RM of September 1991. The Government had the right to 20% equity in all new mining ventures, of which 10% was a free share and the remainder, a buy-in option. Net profits were taxed at the rate of 35% after a 5-year exemption period. The ad valorem tax was 3%, and the depletion allowance was as high as 27.5%. Petroleum exploration and exploitation were regulated by Decree No. 30 of May 23, 1969, and by Decree No. 21, April 20, 1970. Produced petroleum was subject to a 6% royalty. Natural gas was subject to a 5% royalty if exported or a 3% royalty if the gas was for the domestic market.

The Malian gold rush continued during 1997. La Société d'Exploitation des Mines d'Or de Sadiola, S.A. (Semos), operated the open pit Sadiola Hill Mine, about 80 kilometers (km) southwest of Kayes in western Mali. Semos is a consortium of Anmercosa Mining (West Africa) Ltd. (38%), a subsidiary of Anglo American Corp. of South Africa; AGEM Ltd. of Barbados (38%), a subsidiary of International African Mining Gold Corp. of Canada; the Government of Mali (18%); and the International Finance Corp. (IFC) (6%), a member of the World Bank Group. Ore was run through a semiautogenous grinding mill and leached with cyanide. Gold was recovered by two carbon-in-pulp processing lines. The \$303 million mine began commercial operations on March 1, 1997, and produced 11.3 t of gold during the year (IAMGOLD, January 12, 1998, Sadiola gold mine to

produce 500,000 ounces in 1998 at a direct cash cost of US\$112 per ounce, email from [portfolio@newswire.ca](mailto:portfolio@newswire.ca)). Mine and plant operations reportedly exceeded the ore-handling design capacity of 4 million tons per year of ore during the last half of the year (IAMGOLD, November 12, 1997, IAMGOLD issues 1997 third quarter results, email from [portfolio@newswire.ca](mailto:portfolio@newswire.ca)). (See table 1.)

The Société des Mines d'Or de Syama, S.A. (Somisy), operated the open pit gold mine at Syama, 75 km southwest of Sikasso. During 1997, Randgold Minerals Mali Inc. acquired an additional 10% equity interest in Somisy from the IFC. Somisy's ownership structure at yearend was Randgold (75%), the Government of Mali (20%), and the IFC (5%). Randgold reported that proven open-pit reserves at Syama were 15.71 million metric tons (Mt) at a grade of 4.4 grams of gold per ton (g/t), measured/indicated gold resources from the open pit and potential underground operations were 12.7 Mt at a grade of 4.2 g/t, and measured gold resources were 3.76 Mt at a grade of 1.75 g/t in the medium-grade stockpiles (Randgold Resources Ltd., 1997). Randgold proposed a two-phase upgrade for the plant, including a new crusher, a new mill, and process-engineering changes.

JCI Ltd. of South Africa divested itself of its joint venture interest in the former Kalana underground gold mine. Nelson Gold Ltd. of Canada subsequently acquired 70% interest in the property from Ashanti Goldfields Co. Ltd. of Ghana, which retained 10% interest. A mid year feasibility study by Nelson proposed to deepen existing shafts and upgrade the plant's treatment capacity. Action on the proposal, however, was postponed because of declining gold prices. North of Kalana, Société pour le Développement des Investissements en Afrique S.A. (Sodinaf) of Mali was engaged in predevelopment activities on the Kodieran permit. The proposed Kodieran open pit was projected to be Mali's third largest gold mine by 1999 (Geert De Clereq, September 2, 1997, Mali gold rush pits diggers against mining groups, accessed September 10, 1997, at URL <http://eleet.org/Content?arn=a0401LBY322r...mining&lk=noframes&col=NX&kt=A&ak=allnews>).

The ownership of the Société Minière de Loulo S.A. was altered when Randgold increased its interest in the joint venture to 51%, with Mine Or, a subsidiary of LaSource of France, retaining 29% equity interest and the Government of Mali keeping 20% equity interest. Somilo was evaluating the development possibilities of the Loulo 0 and the Yalea deposits on the Loulo permit.

A number of companies were active on exploration permits along the western border with Senegal in the area encompassing the Kéniéba gold district and the exploitation permits at Loulo and Sadiola. Exploring the area were Afko Corp. Mali, a subsidiary of Afko Korea Inc.; Sanou Mining Corp., the partnership of Azco Mining Inc. of the United States and West

African Gold and Exploration Ltd. of the British Virgin Islands, on the Médinandi and the Dandoko concessions; Echo Bay Mines Ltd. of Canada on the Dag Dag permit; Emerging Africa Gold Inc. of Canada on the Mankouke West, the Koulo, and the Siribaya permits; and International Tournigan Corp. of Canada on the Diangounte West property. During 1997, International Tournigan also entered into a joint venture with Société Nationale de Recherches et d'Exploitation des Ressources Minières de Mali (SONAREM) to earn 70% interest in the Kolomba and Mogoyafara properties. Marchmont Gold Corp., formerly Timbuktu Gold Corp., drilled the Sitakili permit.

Nevsun Resources Ltd. of Canada was studying the Tabakoto and the Kakadian concessions. Oliver Gold Corp. of Canada and Consolidated Mining Corp. (West Africa) of Mali (CMCWA) were negotiating to sell the Segala and the Dar Salam concessions at year end. Oxford Resources Inc. of Canada was evaluating the Sélou, the Dialafara-Rhama, and the Kéniéba group exploration permits. Pangea Goldfields Inc. of Canada was drilling the Fodié property, north of Sadiola.

In March, African Selection Mining Corp. (ASM) obtained an option to earn 50% of Pan African Resources Corp. of Canada's (PARC) interest in the Dioulafoundou permit. In September, ASM terminated its option. PARC subsequently terminated its interest in the Dioulafoundou property. A sister company of Randgold Resources Mali Inc., Randgold Resources (Mali) Ltd., through subsidiary Randgold Resource Mali S.A.R.L. explored the Kérékoto 1, the Kérékoto 1 Extension, the Kérékoto 2, the Ouiaiga, and the Yanifolila permits. Randgold indicated it would relinquish the Kerekoto 1 and the Ouiaiga permits in 1998. Randgold, through affiliate Dialafara Exploration S.A., continued the evaluation of the Dialafara permit.

Also working in the Kéniéba region were Raymor Resources Ltd. of Canada and Cie. de la Falame S.A. of Mali on the Yeremounde gold property. Raymor also was evaluating the Bogodo gold placer. Ressources Robex Inc. of Canada increased its interest in the Diangounte and the Kata concessions to 85% from 51%. Ressources Robex and N'Gary Transport were drilling on the properties. Ressources Robex (25%) was drilling the Baroya concession for its joint venture partners, Shiega Resources Corp. of Canada, formerly Alpine Exploration Corp. (65%), and SOMEX S.A.R.L. of Mali (10%). Reunion Mining plc of the United Kingdom abandoned the Sanoukou exploration permit it had optioned from SONAREM. Sadiola Exploration Ltd. of the British Virgin Islands (SADEX) was evaluating the Farabakouta zone north of the Sadiola pit in the Sadiola I exploration permit area and the Alamoutala deposit, about 15 km north of Sadiola in the Sadiola II exploration permit. SADEX also acquired the Yatela concession from Eltin Ltd. of Australia and looked at the Niamboulama mineralized zone on Yatela. In 1996, the Korean Institute of Geology, Mining, and Materials had begun mineralogical research in Mali.

Companies evaluating exploration permits in the Kalana, the Kangaba, and the Syama regions south of Bamako included Alagona Trading, Barrick Gold Corp., Mink Mineral Resources Inc. of Canada, Oxford, Pacific Galleon Mining Corp. of Canada, and Pangea Goldfields. Prospex Mining Inc. of the United States was acquiring the Samalofila property from Nearco Jersey (Nominees) Ltd. Randgold ran an aerial geophysical program

over the Morila permit, and Sahelian Goldfields Inc. of Canada studied the Kourémalé-Salémalé property. North of Kalana, Young Poong Mining and Construction of Korea was evaluating the Gouenso concession. The Metal Mining Agency of Japan and the Japan International Cooperation Agency contracted to explore the Baoule-Banifing area.

In the northeast, CMCWA and Oliver Gold increased their equity interest in Taghlit S.A. of Mali and Taghlit's Anéfis and In Darset exploration permits.

Diamonds were recovered as byproduct by artisanal gold miners. The Mali Diamond Exploration B.V. joint venture of Ashton West Africa Pty. Ltd. of Australia (51% interest) and Mink Mineral Resources (49%) completed an aeromagnetic survey of their Kéniéba area diamond prospect.

Sodinaf evaluated the development of a spodumene deposit near Boungoini.

Sahelian Oil Ltd. of Canada merged with Malahide Petroleum Corp. of Canada to form Stratic Energy Corp during the year. Stratic reprocessed existing seismic data that covered its three petroleum exploration leases in Mali.

Mali's transportation infrastructure was underdeveloped. The highway network totaled about 15,700 km, mostly in the south. The 1,286-km railroad connecting Bamako with Dakar, Senegal, and the major roads to Côte d'Ivoire were used to import mineral-related products, particularly fuels, as well as equipment and supplies. The gold rush and anticipated development activity will strain Mali's electrical power system. Gold will likely continue to dominate the country's mineral economy with current exploration efforts likely to lead to development of additional gold deposits by the turn of the century.

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## Major Sources of Information

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## Major Publications

Ministère des Mines, de l'Energie et de l'Hydraulique, 1995, The statutory rule of the mining sector and the given opportunities for the private investors in Mali: Bamako, Ministère des Mines,

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Nationale de la Géologie et des Mines, 4 p.

TABLE 1  
MALI: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/		1993	1994	1995	1996	1997
Cement, hydraulic		20,000	15,000	13,000	12,000 r/	10,000
Gold, mine output, gold content 3/	kilograms	5,500	6,200	7,800	8,400	19,000
Gypsum		700	500	450	500	100
Iron	kilograms	--	--	69	--	--
Phosphate		2,000	1,039	3,000	-- r/	--
Salt		5,000	5,000	5,000	5,000	5,000
Silver 4/	kilograms	190	200	250	270	800

r/ Revised.

1/ Includes data available through July 1998.

2/ In addition to the commodities listed, Mali produced clays, stone, and sand and gravel for local construction purposes in addition to diamond, marble, and tin, but information is inadequate to make reliable estimates of output levels.

3/ Includes estimate of artisanal production.

4/ Estimated silver content of doré bullion.