

THE MINERAL INDUSTRY OF

JORDAN

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Jordan's mineral industry was focused on the production of industrial minerals, including raw materials for the construction industry. The nation ranked sixth in global phosphate rock production and seventh in potash production. Although most of the mineral production was exported, increasing quantities of phosphate and potash were being consumed in the domestic manufacture of fertilizers. Limestone was consumed by the domestic cement industry and by the Dead Sea Chemical Industries' Complex in the production of soda ash. (See table 1.) Energy needs, however, were primarily met by imports.

The Government agency responsible for all activities related to the exploration and development of minerals and mineral fuels is the Jordan Natural Resources Authority (NRA). The exploitation of Jordan's major mineral commodities and manufactures—cement, kaolin, phosphates, and potash—were all controlled by parastatals. Aggregates, basalt, calcium carbonate, dimensional stone, and glass sand were produced by private-sector firms. Foreign investors may own all or part of a business or project in most economic sectors; however, foreign ownership in the mining sector is limited to a maximum of 50%. Foreign entities are given the same rights, under the law, as Jordanian investors and may fully repatriate capital and profits. Fixed assets of a project and spare parts imported for the project are tax exempt. The corporate income tax is 15% for companies in mining and 25% for companies in trade and transport.

In 1997, the last year for which trade data are available, total exports were nearly \$1.96 billion, including nearly \$0.5 billion in phosphate, potash, and fertilizer. Minerals remained the nation's significant export earner (about 26%); this figure should rise steadily as new projects come on-stream. Imports totaled \$4.4 billion, including \$0.5 billion in fuel and other energy imports (World Bank, 1998).

Jordan was experiencing an overcapacity in the manufacture of reinforcing bar with production at 850,000 metric tons per year (t/yr) and consumption at 350,000 t/yr. Jordan's producers are rerollers. Jordan Iron and Steel Co. Ltd. (JISC) operated two small electric arc furnaces, and United Steel Co. Ltd. was trying to install its own melting shop. Imported billet, principally from the Commonwealth of Independent States, was the principal raw material. JISC, Arab Iron and Steel Industries Co. Ltd., and National Iron & Steel Industries Co. Ltd. were the first three producers in Jordan, dominating the market until the Gulf War. Jordan Steel Co. Ltd. was a 300,000-t/yr-capacity reroller that started up its Pomini-Techint

plant in 1996. The company was backed by investors in Saudi Arabia and the United Kingdom. The country's other producers included Philadelphia Steel Co. Ltd., Middle East Iron and Steel Industries Co. Ltd., and Universal Steel Co. Ltd. (Metal Bulletin, 1998).

The Government's privatization efforts sustained credibility with the sale of 33% equity in Jordan Cement Factories Co. Ltd. to Lafarge of France. The cement plants were upgraded with the objective of improving the environmental performance of the facilities particularly reduction in energy consumption (Middle East Economic Digest, 1998d).

A bromine-exporting complex will be established as a joint venture among Albermarle Holdings of the United States, Jordan Dead Sea Industries Co. Ltd., and Arab Potash Co. Ltd. (APC). The \$120 million venture of the Jordan Bromine Co. Ltd. will be built near the Al-Safi plant, which will extract bromine from the Dead Sea by using the APC's solar evaporators to produce 50,000 t/yr of bromine, 35,000 t/yr of calcium bromide, and 50,000 t/yr of tetrabromobisphenol (a flame retardant). Construction of the complex was scheduled to begin in 1999 with completion scheduled for 2002 (Industrial Minerals, 1998).

The Jordan Magnesite Co., a subsidiary of Jordan Dead Sea Industries Co. Ltd., was planning a magnesium oxide plant with a capacity of 50,000 t/yr of dead-burned magnesium oxide for the refractory industry and 10,000 t/yr of special magnesium oxide and magnesium hydroxide for the chemical and plastics industries. The plan included storage and loading facilities at Aqaba. The Jeddah Islamic Development Bank supplied a \$28 million loan for the estimated \$90 million project. Local banks were expected to provide a further \$20 million, and the balance was to come from Jordan Magnesite's capital (Middle East Economic Digest, 1998a).

Jordan Phosphate Mines Co. Ltd. will double its production of phosphoric acid and compound fertilizers to 3.3 Mt/yr and increase phosphate production from 6 to 8 Mt/yr at a cost of \$240 million (Mining Journal, 1998).

Hydro Agri Jordan Co. Ltd., a joint venture of Norsk Hydro A/S and the Jordan Phosphate Mines Co. Ltd., accepted bids for an estimated \$600 million to \$700 million turnkey facility for the production of phosphoric acid and compound fertilizers. The project includes production of 440,000 t/yr of phosphoric acid at the Shidiyeh Mine site in southern Jordan and 1.2 million metric tons per year of compound fertilizers at a site next to the existing fertilizer plant in Aqaba. Contract awards were expected in early 1999. Production was scheduled to

¹Deceased.

begin in late 2001 (Middle East Economic Digest, 1998e).

APC and Kemira Agro Oy of Finland have formed a joint venture to produce 150,000 t/yr of potassium nitrate fertilizer and 75,000 t/yr of dicalcium phosphate (a cattle feed supplement). About half of the output was intended for sale in the Middle East and eastern Mediterranean; the remainder, in the Far East. The \$70 million plant was scheduled to come on-stream in 2000. Around 120,000 t/yr of potash and 40,000 to 50,000 t/yr of phosphates will be supplied by APC for the production of these specialty fertilizers and feeds. The new plant will use Kemira's ion-exchange technology licensed by Kemira's Danish subsidiary (Middle East Economic Digest, 1998b).

Phosphate rock reserves, as reported by direct communication with the Jordan Phosphate Mines Co., Ltd., are proven at 915 million metric tons (Mt), possible at 344 Mt, and probable at 425 Mt (Jordan Phosphate Mines Co. Ltd., 1998). Crude petroleum reserves are 0.3 million barrels and natural gas is 5.6 billion cubic meters (Arab Petroleum Research Center, 1998).

The demand for electricity was expected to increase by as much as 22% between 1998 and 2000. Natural gas will supply 50% of the demand by 2000. Major consumers were the two existing power stations in Aqaba and Zerka and the planned 300- to 450-megawatt-capacity Samra plant. Imports from Egypt will be 300 million cubic meters per day, and Inter Jordan Gas Co. Ltd. will handle the distribution of natural gas throughout Jordan (Middle East Economic Digest, 1998c).

The Aqaba Railway Corp.'s 300-kilometer (km) rail line transported phosphate from the Abiad and Hassa Mines to the port of Aqaba for export. A 25-year concession contract has been offered by the Government with a caveat requiring the construction of 22- and 16-km spur lines to enable the railway to serve the new Shidiya phosphate mine and an industrial complex near Aqaba. Construction will be completed by mid-2001 and will allow for an increase in annual shipments over the rail system from about 3 to about 10 Mt by 2002 (Journal of Commerce, 1998).

Jordan's strengthening economy, commitment to infrastructure development, privatization progress, strategic

regional location, and favorable investment reforms (such as reduction of taxes, and the right to repatriate profits) find favor with potential investors in spite of the uncertainties surrounding the Middle East peace process. The joint-venture approach has brought new investors to Jordan, including the Indo-Jordan Chemicals Company, a \$170 million joint venture with India's Southern Petrochemicals Industries Co., to produce 200,000 t/yr of phosphoric acid, and the Nippon-Jordan Chemical Co., a joint venture with APC and the Japanese agricultural federation Zen-noh, Mitsubishi Corp., and Asahi Industries Co. Ltd., for a 300,000-t/yr compound fertilizer and ammonium phosphate plant in Aqaba. The development of downstream projects requires expansion of phosphate and potash production.

The World Bank plans to more than double the \$160 million loan extended to Jordan in 1998 to \$365 million in 1999. The loan should further stimulate economic growth, as well as enable the country to approach bilateral donors for matching finance for a number of projects.

References Cited

- Arab Petroleum Research Center, 1998, Jordan, in Arab oil & gas directory: Paris, Arab Petroleum Research Center, p. 183.
- Industrial Minerals, 1998, APC/Jodico sign bromine deal with Albemarle: Industrial Minerals, no. 375, December, p. 15.
- Jordan Phosphate Mines Co. Ltd., Communication reference R&D 98 8222, July 30.
- Journal of Commerce, 1998, Wisconsin Central wins bid for line in Jordan: Journal of Commerce, November 25, p. 15A.
- Metal Bulletin, 1998, Over-capacity in rebar hits Jordan: Metal Bulletin, no. 8333, December 7, p. 28.
- Middle East Economic Digest, 1998a, Bids invited for magnesia project: Middle East Economic Digest, v. 42, no. 24, June 12, p. 17.
- 1998b, Fertilizer first for Arab potash: Middle East Economic Digest, v. 42, no. 19, May, p. 24.
- 1998c, Gas pipeline takes shape: Middle East Economic Digest, v. 42, no. 33, August 14, p. 31.
- 1998d, Lafarge set to buy stake in Jordan Cement: Middle East Economic Digest, v. 42, no. 45, November 6, p. 26.
- 1998e, Norsk Hydro project launched: Middle East Economic Digest, v. 42, no. 31, July 31, p. 26.
- Mining Journal, 1998, Phosphate project to expand: Mining Journal, v. 332, no. 8536, June 18, p. 460.
- World Bank, 1998, Jordan at a glance: World Bank, September 29, p. 42.

TABLE 1
JORDAN: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1994	1995	1996	1997	1998
Cement, hydraulic thousand tons	6,400 e/	3,508 r/	3,610 r/	3,250 r/	1,386
Feldspar e/	2,500 r/	2,500 r/	2,500 r/	-- r/ 3/	4,008 3/
Gypsum	193,000	190,000 r/	190,000 r/	193,527 r/ 3/	175,807 3/
Kaolin	47,200	47,500 r/	47,500 r/	57,255 r/ 3/	78,000 3/
Lime	7,270 e/	7,275 r/	7,275 r/	4,263 r/	4,064
Natural gas, gross million cubic meters	-- r/	-- r/	-- r/	291 r/	264
Petroleum:					
Crude 42-gallon barrels	-- r/	-- r/	-- r/	14,680 r/	14,543
Refinery products: thousand 42-gallon barrels					
Liquefied petroleum g do.	1,500 e/	1,500 e/	1,500	1,542 r/ 3/	1,660 3/
Gasoline do.	4,130 e/	4,500 e/	4,500 r/	4,469 r/ 3/	5,429 3/
Jet fuel do.	500 r/ e/	500 r/ e/	300 r/	253 r/ 3/	245 3/
Kerosene do.	2,000 r/ e/	2,000 r/ e/	1,500 r/	1,507 r/ 3/	1,517 3/
Distillate fuel oil do.	6,050 r/ e/	6,000 e/	6,500 r/	6,920 r/ 3/	6,882 3/
Residual fuel oil do.	6,390 r/ e/	6,500 r/ e/	7,000	7,326 r/ 3/	7,105 3/
Other do.	1,000 r/ e/	1,000 e/	1,000 r/	866 r/ 3/	783 3/
Total do.	24,070 r/	22,000 r/ e/	22,300 r/	22,883 r/ 3/	23,621 3/
Phosphate:					
Mine output:					
Gross weight thousand tons	4,218	4,983	5,355 r/	4,720 r/	5,817
P2O5 content do.	1,399	1,655	1,765 r/	1,510 r/	1,862
Phosphatic fertilizers	749,700	729,300 r/	639,800 r/	576,142 r/	579,835
Phosphoric acid	NA	NA	NA	37,761 r/	68,345
Potash:					
Crude salts thousand tons	1,550	1,790 r/	1,765	1,447 r/	1,517
K2O equivalent do.	930	1,075	1,080 r/	868 r/	910
Salt	26,000	25,000 r/ e/	25,000 r/ e/	61,000 r/	194,845
Steel, crude e/	30,000	30,000	30,000	30,000	30,000
Stone:					
Dimension, worked thousand meters	6,000	6,000	6,000	6,308 3/	6,205 3/
Limestone thousand cubic meters	5,340 r/	6,000 r/	8,000 r/	12,388 r/ 3/	8,031 3/
Marble do.	112	112	100 r/	58 r/ 3/	135 3/

e/ Estimated. r/ Revised. NA Not available.

1/ Table includes data available through July 1, 1999.

2/ In addition to the commodities listed, soda ash was produced, but output was not reported quantitatively, and available information was inadequate to make reliable estimates.

3/ Reported figure.