



# 2017–2018 Minerals Yearbook

---

**JORDAN [ADVANCE RELEASE]**

---

# THE MINERAL INDUSTRY OF JORDAN

By Mowafa Taib

**Note: In this chapter, information for 2017 is followed by information for 2018.**

Jordan was a global supplier of bromine, phosphate rock, potash, and their derivatives in 2017. The country was the world's (excluding the United States) second-ranked producer of bromine after Israel and accounted for 25% of the world's (excluding the United States) output. Jordan was the world's fifth-ranked producer of phosphate rock after China, Morocco and Western Sahara, the United States, and Russia, and accounted for 3.2% of the world's production in 2017. The country was the world's seventh-ranked producer of potash and accounted for 3.4% of the world's output. Other mineral commodities exported by Jordan included aluminum fluoride, calcium carbonate, Dead Sea mud and salt, kaolin, marble, pozzolanic materials, salt, industrial sand, travertine, and zeolites (Energy and Minerals Regulatory Commission, 2018, p. 58–59; Jasinski, 2019a, b; Schnebele, 2019).

## Minerals in the National Economy

The mining and quarrying sector's share of Jordan's gross domestic product (GDP) in real values in 2017 was 1.9%; that of manufacturing, which included the mineral sector, 19.2%; and that of the construction sector, 5.3%. The country's GDP increased in real terms by 2.1% in 2017 compared with an increase of 2.2% in 2016. The value of the mining and quarrying sector increased by 13.0% compared with a decrease of 12.1% in 2016. The output of the manufacturing sector, which included cement, fertilizer, iron, and steel production, increased by 1.0% compared with an increase of 1.1% in 2016. The output of the construction sector decreased by 1.1% in 2017 compared with an increase of 1.1% in 2016 (Central Bank of Jordan, 2018, p. 7–11).

In 2017, the Ministry of Energy and Mineral Resources (MEMR) managed Jordan's mineral resources under the Organization of Natural Resources Affair Law (law No. 12 of 1968). The law entrusts the MEMR with the responsibility of prospecting for, of conducting geologic and economic studies regarding, and of developing the country's natural resources. However, the MEMR is required to obtain exploration, mining, and quarrying permits from the Energy and Minerals Regulatory Commission (EMRC). The EMRC is an autonomous agency with responsibility for such permitting, as well as for oversight of electricity, minerals, and nuclear installations in the country and mineral products export licenses. The EMRC is the legal successor of the Electricity Regulatory Commission, the Jordan Nuclear Regulatory Commission, and the Natural Resources Authority. In 2017, the EMRC issued 1,872 mineral export permits, 244 quarrying permits, 10 exploration permits, and 3 mining permits. The MEMR plan for 2016 through 2018 included continued mineral exploration studies for such metals as copper and gold, and for such industrial minerals as chalk, dolomite, oil shale, phosphate rock, and potash (Ministry of

Energy and Mineral Resources, 2018a, p. 19, 58, 61; Energy and Minerals Regulatory Commission, 2018, p. 53).

The Government was focused on developing alternative sources of domestic energy, such as oil shale and nuclear, solar, and wind energy to reduce the cost of mineral fuel imports. The national comprehensive energy strategy called for using oil shale as a fuel to generate electricity and (or) to produce crude petroleum. One of the objectives of Jordan's energy strategy was to increase the share of renewable energy usage to meet 10% of the country's primary energy needs by 2020 (Ministry of Energy and Mineral Resources, 2018b, p. 9, 23).

## Production

In 2017, production of marble increased by 215%; granite slab, by 137%; Dead Sea mud, by 75%; kaolin, by 59%; aluminum fluoride, by 50%; stone and gravel for construction, by 48%; fertilizers, by 27%; sulfuric acid, by 21%; phosphoric acid and industrial sand and gravel, by 18% each; potash ( $K_2O$  content), by 16%; and crude potash salts, by 11%. Mineral commodity production decreased in 2017 compared with that of 2016 most notably for crushed basalt, by 40%; crude petroleum, by 25%; calcium carbonate, by 24%; Dead Sea salt, by 13%; and natural gas and jet fuel, by 12% each. Data on mineral production are in table 1.

## Structure of the Mineral Industry

Except for the National Petroleum Co. and Jordan Petroleum Refinery Co. Ltd., which were state owned, all mineral-related companies in Jordan were privately owned or had mixed ownership. Arab Company for White Cement Industry, Arab Potash Co. (APC), Jordan Abyad Fertilizers and Chemicals Co. P.S.C. (JAFCCO), Jordan India Fertilizer Co. (JIFCO), Jordan Lafarge Cement Factories Co. P.S.C. (JCFC), Jordan Phosphate Mines Co. p.l.c. (JPMC), and Nippon Jordan Fertilizer Co. had mixed ownership, and other companies were privately owned. Table 2 is a list of major mineral facilities.

## Mineral Trade

The total value of Jordan's exports increased slightly, to \$6.3 billion in 2017 from \$6.2 billion in 2016. Phosphate rock exports decreased in value to \$376 million in 2017 from \$466 million in 2016 but increased in tonnage to 5.2 million metric tons (Mt) from 4.7 Mt. The main destinations for Jordan's phosphate rock exports were India (which received 63% of the exports) and Indonesia (23%). Fertilizer exports decreased in value to \$188 million in 2017 from \$194 million in 2016. The volume of fertilizer exports included 318,000 metric tons (t) of diammonium phosphate, 138,000 t of potassium nitrate, 134,000 t of compound fertilizer (NPK, or nitrogen,

phosphorus, and potassium), 68,000 t of phosphoric acid, and 15,000 t of triple superphosphate. The primary destinations for Jordan's phosphate fertilizer exports were India, which received 38%; Turkey, 23%; and Iraq, 13%. The value of Jordan's potash exports decreased to \$426 million in 2017 from \$469 million in 2016. The potash exports went mainly to China, India, Indonesia, and Malaysia (Arab Potash Co., 2018, p. 27, 61; Central Bank of Jordan, 2018, p. 69, 72; Jordan Phosphate Mines Co. p.l.c., 2018, p. 15, 23, 34, 41).

Additionally, Jordan exported various quantities of other industrial minerals. These included pozzolanic materials (volcanic tuff) (444,000 t), calcium carbonate (335,000 t), marble (19,000 t), granite (3,700 t), kaolin (2,800 t), travertine (2,600 t), salt (2,400 t), industrial (silica) sand (2,300 t), Dead Sea mud (1,000 t), and Dead Sea salt (200 t) (Energy and Minerals Regulatory Commission, 2018, p. 58).

The value of Jordan's exports to the United States increased to \$1.69 billion in 2017 from \$1.55 billion in 2016, and that of imports from the United States increased to \$1.92 billion in 2017 from \$1.46 billion in 2016. The main mineral commodities exported by Jordan to the United States were inorganic chemicals (bromine products), the value of which increased to \$15 million in 2017 from \$5 million in 2016. The top mineral and mineral-related commodities imported by Jordan from the United States included natural gas valued at \$205 million; excavating machinery and petroleum products, \$12 million each; and finished metal shapes, \$10 million (U.S. Census Bureau, 2018a, b).

## Commodity Review

### *Industrial Minerals*

**Bromine and Potash.**—Jordan's potash production increased to 2.2 Mt in 2017 from 2.0 Mt in 2016. About one-half of the potash produced was a standard grade; 44%, fine grade; and 6%, granular grade. APC employed 2,144 people and had several subsidiaries, including Arab Fertilizers and Chemicals Industries Ltd. (Kemapco), which produced 130,000 t of potassium nitrate and employed 255 people; and Numeira Mixed Salts and Mud Co., which extracted 203 t of Dead Sea mud and employed 78 workers. APC was also affiliated with Jordan Bromine Co. Ltd. (JBC), which had the capacity to produce 200,000 metric tons per year (t/yr) of bromine and other products from the Dead Sea, including calcium bromide, sodium bromide, tetra bromide, and potassium hydroxide. Other affiliates of APC included Jordan Industrial Ports Co. and Nippon Jordan Fertilizer Co., which produced NPK and ammonium phosphate fertilizers. Nippon was a joint venture of JPMC (70% interest), APC (20% interest), and Mitsubishi Corp. of Japan (10% interest) (Arab Potash Co., 2018, p. 22–23, 30, 32; Jordan Bromine Co. Ltd., 2018).

**Phosphate Rock.**—JPMC, which was the country's only phosphate rock producer, produced nearly 8.7 Mt of ore in 2017, which was about a 9% increase compared with the 8.0 Mt produced in 2016. The Eshidiya Mine produced about 6.4 Mt of phosphate rock, or 74% of Jordan's phosphate rock output; the Wadi Al-Abiad Mine produced 1.6 Mt, or 18% of total output; and the Al-Hassa Mine produced 733,000 t, or 8% of the country's phosphate rock production.

The Eshidiya Mine contained more than 1.0 billion metric tons (Gt) of total ore reserves, which included proved, probable, and possible reserves. The Wadi Al-Abiad Mine held 5.2 Mt of proved reserves, and the Al-Hassa Mine contained 15.9 Mt of proved reserves. JPMC also produced 839,000 t of sulfuric acid, which was used for fertilizer manufacturing; 379,000 t of diammonium phosphate fertilizer; and 264,000 t of phosphoric acid at its fertilizer complex in Aqaba. Fifty-nine percent of Jordan's phosphate rock produced in 2017 was exported. The remaining was locally used by fertilizer manufacturers (Jordan Phosphate Mines Co. p.l.c., 2018, p. 12–14, 16).

### *Mineral Fuels and Related Materials*

**Oil Shale.**—During the past 5 years, the Government had been actively promoting the country's oil shale resources to attract foreign direct investment to this industry. Oil shale is a solid hydrocarbon rock, whereas shale oil, or tight oil, is a light crude oil occurring in sedimentary formations, such as limestone, tight sandstone, or shale. The geologic estimates of oil shale reserves from five main deposits in Jordan (Attarat El-Ghudran, El-Lajjun, Jurf Ed Darawish, Sultani, and Wadi Maghar) were estimated to be more than 70 Gt, including measured and indicated reserves of 7 Gt of crude petroleum. Jordan's national energy strategy included a target of 12% for oil shale's share in the country's energy mix as a source of alternative energy by 2020 (Abu Salah and others, 2015, p. 15; Ministry of Energy and Mineral Resources, 2018a, p. 37–39).

As of yearend 2017, seven international and local companies were involved in oil shale development, either by direct burning to generate electricity, or through in situ retorting or surface retorting to produce oil. These companies included Karak International Oil Co. (KIO), Jordan Oil Shale Energy Co. (JOSE; a subsidiary of Eesti Energia Consortium of Estonia), Jordan Oil Shale Co. (JOSCO; a subsidiary of Royal Dutch Shell plc of the United Kingdom), and Saudi Arabian Corporation for Oil Shale (SACOS) (Ministry of Energy and Mineral Resources, 2018a, p. 38–39).

JOSCO held a concession that comprised several locations and covered 22,270 square kilometers (km<sup>2</sup>). The company developed a subsurface model for exploiting oil shale using an in situ conversion process, which would eliminate the need to transport oil shale to processing plants. Attarat Power Company (APCO) of Jordan held the Attarat concession, which is located at the Attarat um Ghudran property and covers 42 km<sup>2</sup> in central Jordan and contains 2 Gt of oil shale reserves. The concession area could be increased to include an additional 4 Gt of oil shale reserves. APCO along with Eesti Energia Consortium, YTL Power International Berhad of Malaysia, and Yudeam Group Co. Ltd. of China, were building the first oil-shale-fired powerplant in the region in 2017. The plant would have a 470-megawatt (MW) capacity and was expected to begin production in 2020. The project was financed by the Bank of China and the Industrial and Commercial Bank of China (Jordan Oil Shale Co., 2017; Ministry of Energy and Mineral Resources, 2018a, p. 38–39).

## MINERAL INDUSTRY HIGHLIGHTS IN 2018

Jordan was a global supplier of bromine, phosphate rock, potash, and phosphate- and potash-based fertilizers in 2018. The country accounted for 28% of world bromine production (excluding the United States), 3.4% of potash production, 3.2% of phosphate rock production, and about 1% of zeolites production. Eighty-six mining companies were active in Jordan in 2018; they produced 12 industrial mineral commodities: granite, gypsum, kaolin, limestone, marble, phosphate rock, potash, pure limestone, silica sand, travertine, volcanic tuff (pozzolan), and zeolites (Ministry of Energy and Mineral Resources, 2019, p. 19; Flanagan, 2020; Jasinski, 2020a, b; Schnebele, 2020).

### Government Policies and Programs

The Royal Decree No. 19 of April 10, 2018, also known as the Natural Resources Law of 2018, replaced law No. 12 of 1968, also known as the Organization of Natural Resources Affairs Law. The Natural Resources Law of 2018 entrusts the MEMR with the development of natural resources and the implementation policies related to exploration and mining of the country's natural resources. The MEMR is also responsible for conducting exploration studies and geologic surveys, for identifying natural resources, and for promoting their development locally and abroad. The law assigns the Council of EMRC Board of Commissioners to issue mining and quarrying permits as well as mineral export permits (Ministry of Energy and Natural Resources, 2018b).

### Production

Notable increases in mineral production in 2018 compared with that of 2017 included production of liquefied petroleum gas, which increased by 735%; crude petroleum, by 213%; diammonium phosphate, by 67%; granite slab, by 45%; total refinery products, by 20%; fertilizers, by 27%; Dead Sea salt, by 21%; kaolin, by 14%; and calcium carbonate, by 10%. Notable decreases in mineral production in 2018 compared with that of 2017 included that of marble, by 81%; travertine, by 54%; zeolites, by 33%; asphalt, by 26%; Dead Sea mud, by 22%; residual fuel oil, by 19%; distillate fuel oil and gasoline, by 13% each; jet fuel, by 12%; and construction sand and gravel, by 11% (table 1).

### Mineral Trade

Jordan's mineral commodity exports included, phosphate rock (4.2 Mt), potash (2.4 Mt), sand (688,000 t), diammonium phosphate (583,000 t), calcium carbonate (397,000 t), phosphoric acid (61,000 t), volcanic tuff (30,000 t), aluminum fluoride (8,000 t), granite (5,464 t), salt (5,126 t), industrial sand (4,326 t), marble (3,739 t), kaolin (3,396 t), Dead Sea salts (1,266 t), travertine (1,209 t), gypsum (500 t), and Dead Sea mud (159 t) (Energy and Minerals Regulatory Commission, 2019, p. 62).

## Commodity Review

Manaseer Magnesia Co. (a subsidiary of the Manaseer Group, which acquired JPMC subsidiary Jordan Magnesia Co. in 2016) started production of caustic calcined magnesia (MgO) at its plant in Ghor Al Safi in the Dead Sea at an annual production capacity of 60,000 t. In 2017, the company began production of caustic and hydrated lime at the same plant. The Manaseer Group also produced, through its companies, calcium carbonate, cement, fertilizers, granite, iron and steel, kaolin, marble, pumice, and pozzolanic material (table 2; Manaseer Group, 2019).

Kamil Holdings Ltd. of Brunei, which held a 37% interest in JPMC, sold its share in the company to Indian Potash Ltd. and Kisan International Trading FZE of the United Arab Emirates. As of yearend 2018, the shareholders of JPMC were Indian Potash Ltd. (27.4%), the Government of Jordan (25.7%), the Social Security Corp. of Jordan (16.5%), Kisan International Trading FZE (9.6%), the Government of the State of Kuwait (9.3%), and other investors (11.5%) (table 2; Jordan Phosphate Mines Co. p.l.c., 2019, p. 42).

JPMC planned to increase aluminum fluoride production at its industrial complex in Aqaba by rehabilitating the existing plant and building a new plant at the Eshidiya complex in partnership with Alufuoride Ltd. of India. The proposed plant was expected to increase its aluminum fluoride production capacity to 20,000 t/yr from 14,000 t/yr (Jordan Phosphate Mines Co. p.l.c., 2019, p. 31).

Nutrien Ltd. of Canada, which was the parent company of PCS Jordan LLC, sold its share in APC to SDIC Mining Investment Co. of China (the parent company for Man Jia Industrial Development Ltd.) in 2018. Thus, Man Jia Industrial Development Ltd. became a major shareholder in APC at 26% (table 2; Arab Potash Co., 2019, p. 33).

### Outlook

Jordan's total production capacity of aluminum fluoride, bromine products, phosphate rock, and potash and their derivatives is likely to increase in the next 5 years as the commissioning of new projects and the expansion and rehabilitation of existing facilities come to fruition. The increase in production, however, will largely depend on the global demand for these commodities, particularly from Asian markets. The Government is likely to continue its focus on the development of oil shale resources as a source of alternative energy. Jordan's first 470-MW oil-shale-fired powerplant is expected to commence operations in 2020.

### References Cited

- Abu Salah, A., Alali, J., Yasin, S.M., and Al Omari, W., 2015, Oil shale: Amman, Jordan, Ministry of Energy and Mineral Resources, 23 p. (Accessed July 28, 2017, at <http://www.memr.gov.jo/EchoBusV3.0/SystemAssets/PDFs/AR/MineralTR/Oil%20Shale.pdf>.)
- Arab Potash Co., 2018, Annual report 2017: Amman, Jordan, Arab Potash Co., April 20, 127 p. (Accessed October 16, 2018, at <http://www.arabpotash.com/EchoBusV3.0/SystemAssets/PDFAR/Annual%20report%202017%20English.pdf>.)
- Arab Potash Co., 2019, Annual report 2018: Amman, Jordan, Arab Potash Co., April 20, 163 p. (Accessed August 26, 2019, at <http://www.arabpotash.com/EchoBusV3.0/SystemAssets/PDFEN/APC%202018%20Annual%20English.pdf>.)

- Central Bank of Jordan, 2018, Annual report 2017: Amman, Jordan, Central Bank of Jordan, September, 185 p. (Accessed October 13, 2018, at <http://www.cbj.gov.jo/EchoBusV3.0/SystemAssets/c1e184ab-ad4e-4ed8-a24e-0fb908dd46e8.pdf>.)
- Energy and Minerals Regulatory Commission, 2018, Annual report 2017: Amman, Jordan, Energy and Minerals Regulatory Commission, 129 p. (Accessed October 11, 2018, at <http://www.emrc.gov.jo/echobusv3.0/systemassets/annual%20report%202017.pdf>.)
- Energy and Minerals Regulatory Commission, 2019, Annual report 2018: Amman, Jordan, Energy and Minerals Regulatory Commission, 91 p. (Accessed March 11, 2020, at [http://www.emrc.gov.jo/images/reports/annual\\_rep2017.pdf](http://www.emrc.gov.jo/images/reports/annual_rep2017.pdf).)
- Flanagan, D.M., 2020, Zeolites (natural): U.S. Geological Survey Mineral Commodity Summaries 2020, p. 188–189.
- Jasinski, S.M., 2019a, Phosphate rock: U.S. Geological Survey Mineral Commodities Summaries 2019, p. 122–123.
- Jasinski, S.M., 2019b, Potash: U.S. Geological Survey Mineral Commodity Summaries 2019, p. 126–127.
- Jasinski, S.M., 2020a, Phosphate rock: U.S. Geological Survey Mineral Commodities Summaries 2020, p. 122–123.
- Jasinski, S.M., 2020b, Potash: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 126–127.
- Jordan Bromine Co. Ltd., 2018, Overview: Amman, Jordan, Jordan Bromine Co. Ltd. (Accessed October 13, 2018, at <http://www.jordanbromine.com/AboutJBC/Overview.aspx>.)
- Jordan Oil Shale Co., 2017, About JOSCO: Jordan Oil Shale Co. (Accessed May 9, 2019, at <https://www.josco.jo/about-josco>.)
- Jordan Phosphate Mines Co. p.l.c., 2018, Annual report 2017: Amman, Jordan, Jordan Phosphate Mines Co. p.l.c., March 28, 118 p. (Accessed October 11, 2018, at <http://www.jpmc.com.jo/echobusv3.0/SystemAssets/248b5383-2ca2-4e23-9e61-f4a764af104a.pdf>.)
- Jordan Phosphate Mines Co. p.l.c., 2019, Annual report 2018: Amman, Jordan, Jordan Phosphate Mines Co. p.l.c., 131 p. (Accessed August 29, 2019, at <http://www.jpmc.com.jo/echobusv3.0/SystemAssets/91348326-c309-4bb0-8ad6-888a8c85e86a.pdf>.)
- Manaseer Group, 2019, Investments—Sectors: Amman, Jordan, Manaseer Group. (Accessed August 27, 2019, at <https://www.manaseergroup.com/investment>.)
- Ministry of Energy and Mineral Resources, 2018a, Annual report 2017: Amman, Jordan, Ministry of Energy and Mineral Resources, 82 p. (Accessed January 14, 2018, at <https://memr.gov.jo/echobusv3.0/SystemAssets/469adf39-0f2f-4d01-a72b-d394c3b56332.pdf>.)
- Ministry of Energy and Mineral Resources, 2018b, Natural resources law: Amman, Jordan, Ministry of Energy and Mineral Resources, 22 p. (Accessed August 27, 2019, at <http://www.memr.gov.jo/echobusv3.0/SystemAssets/27837e72-d7f4-4705-a3e9-de6cf78a2a4b.pdf>.) [In Arabic.]
- Ministry of Energy and Mineral Resources, 2019, Annual report 2018: Amman, Jordan, Ministry of Energy and Mineral Resources, 65 p. (Accessed March 10, 2020, at <https://memr.gov.jo/echobusv3.0/SystemAssets/56dcb683-2146-4dfd-8a15-b0ce6904f501.pdf>) [In Arabic.]
- Schnebele, E.K., 2019, Bromine: U.S. Geological Survey Mineral Commodities Summaries 2019, p. 38–39.
- Schnebele, E.K., 2020, Bromine: U.S. Geological Survey Mineral Commodities Summaries 2020, p. 38–39.
- U.S. Census Bureau, 2018a, U.S. exports by 5-digit end-use code 2008–2017: Washington, DC, U.S. Census Bureau. (Accessed October 13, 2018, at <https://www.census.gov/foreign-trade/statistics/product/enduse/exports/c5110.html>.)
- U.S. Census Bureau, 2018b, U.S. imports by 5-digit end-use code 2008–2017: Washington, DC, U.S. Census Bureau. (Accessed October 13, 2018, at <https://www.census.gov/foreign-trade/statistics/product/enduse/imports/c5110.html>.)

TABLE 1  
JORDAN: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Thousand metric tons, gross weight, unless otherwise specified)

Commodity	2014	2015	2016	2017	2018
<b>METALS</b>					
Iron and steel, steel:					
Raw steel: <sup>c</sup>	150	150	150	150	150
Products, semimanufactured	218 <sup>r,e</sup>	249 <sup>r,e</sup>	200 <sup>r,e</sup>	200	200
<b>INDUSTRIAL MINERALS</b>					
Bromine <sup>c</sup>	100	100	100	100	100
Cement:					
Hydraulic	4,400 <sup>r</sup>	4,500 <sup>r</sup>	4,800	5,060 <sup>e</sup>	5,130 <sup>e</sup>
Clinker	865	853 <sup>r</sup>	575	543	587
Clay:					
Common clay	1,100 <sup>e</sup>	1,100 <sup>e</sup>	364 <sup>r</sup>	364	365 <sup>e</sup>
Dead sea mud	135	115	116	203	159
Kaolin	100 <sup>r</sup>	105 <sup>r</sup>	110 <sup>r</sup>	175	200 <sup>e</sup>
Fertilizers <sup>2</sup>	886	620	548	695	882
Fluorspar, products, aluminum fluoride <sup>3</sup>	9 <sup>r</sup>	8	4	6	6
Gypsum	223 <sup>r,e</sup>	228 <sup>r,e</sup>	252 <sup>r</sup>	241	250 <sup>e</sup>
Phosphate, compounds, phosphoric acid	700 <sup>r,e</sup>	876 <sup>r</sup>	804 <sup>r</sup>	945	995
Phosphate rock:					
Mine:					
Gross weight	7,144	8,336	7,991	8,688	8,022
P <sub>2</sub> O <sub>5</sub> content	2,286	2,668	2,560 <sup>r,e</sup>	2,780	2,567
Diammonium phosphate	590	344	396	379	632
Potash: <sup>4</sup>					
Crude salts	2,091	2,355	2,003	2,230	2,436
K <sub>2</sub> O content	1,255	1,413	1,202	1,392	1,486
Pumice and related materials, pozzolan, pozzolanic material	850 <sup>e</sup>	850 <sup>e</sup>	877	913	900
Salt:					
Brine <sup>c</sup>	35 <sup>r</sup>	40 <sup>r</sup>	40 <sup>r</sup>	40	42
Dead sea	1,736 <sup>r</sup>	2,962 <sup>r</sup>	1,211 <sup>r</sup>	1,048	1,266
Sand and gravel, industrial, unspecified	200 <sup>r,e</sup>	200 <sup>r,e</sup>	361 <sup>r</sup>	426	400 <sup>e</sup>
Stone, sand and gravel, construction:					
Sand and gravel, construction	322 <sup>r,e</sup>	234 <sup>r</sup>	523 <sup>r</sup>	772	688
Stone:					
Crushed, basalt	300 <sup>e</sup>	300 <sup>e</sup>	250	150	150 <sup>e</sup>
Dimension:					
Granite, slab	2,998	2,929	1,589	3,773	5,464
Marble	4,815	9,056	6,166	19,425	3,739
Travertine	6,311	4,526	2,645	2,623	1,209
Other, size and shape unspecified, calcium carbonate	313	412	442	335	370
Sulfur, compounds, sulfuric acid <sup>5</sup>	1,442 <sup>r</sup>	1,206 <sup>r</sup>	1,083 <sup>r</sup>	1,309	1,375
Zeolites, tuff, crude <sup>c</sup>	13,000 <sup>r</sup>	13,000 <sup>r</sup>	14,000 <sup>r</sup>	15,000	10,000
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Natural gas	130 <sup>r</sup>	124 <sup>r</sup>	116	102	94
Petroleum:					
Crude	8,000 <sup>r</sup>	4,000 <sup>r</sup>	3,200 <sup>r</sup>	2,400	7,500
Refinery:					
Asphalt	970	1,139	1,442 <sup>r</sup>	1,344	1,000
Distillate fuel oil	6,938	7,893	6,781	6,304	5,508
Gasoline	5,389 <sup>r</sup>	5,551 <sup>r</sup>	4,956	4,734	4,108
Jet fuel, including kerosene	3,318 <sup>r</sup>	2,992 <sup>r</sup>	3,306 <sup>r</sup>	2,902	2,568
Liquefied petroleum gas	1,056	928	940	905	7,556
Residual fuel oil	5,408	5,894	3,989 <sup>r</sup>	3,756	3,049
Total	23,100 <sup>r</sup>	24,400 <sup>r</sup>	21,400 <sup>r</sup>	19,900	23,800

<sup>c</sup>Estimated. <sup>r</sup>Revised. do. Ditto. -- Zero.

<sup>1</sup>Table includes data available through September 12, 2019. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Unspecified.

<sup>3</sup>From imported fluorspar.

<sup>4</sup>Potassium nitrate and potassium sulfate are included under fertilizers.

<sup>5</sup>From imported sulfur, may include other acids.

TABLE 2  
JORDAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum fluoride	Jordan Phosphate Mines Co. p.l.c. (JPMC) (Indian Potash Ltd., 27.380%; Government Shareholdings' Management Co., 25.655%; Social Security Corp., 16.527%; Kisan International Trading FZE, 9.620; Government of the State of Kuwait, 9.333%; other investors, 11.485%)	Plant at Aqaba	14,000
Bromine	Jordan Bromine Co. Ltd. (JBC) [Albemarle Corp., 50%, and Arab Potash Company Ltd. (APC), 50%.]	Plant at Ghor Al Safi, Dead Sea	200,000
Cement	Al Rajhi Cement-Jordan (Al Rajhi Cement Holding)	Plant at Al Mafraq	2,000,000
Do.	Arab Company for White Cement Industry [Jordanian Syrian Company for Industry, 50%; General Establishment for Cement (Syria), 25%; Jordan Finance Ministry, 15%; Social Security Corp., 10%]	Plant at Amman	130,000
Do.	Jordan Lafarge Cement Factories Co. P.S.C. (JCFC) (Lafarge S.A., 50.28%; Social Security Corp., 21.86%; others, 27.87%)	Plant at Ar-Rashadiya	4,000,000
Do.	Modern Cement and Mining Co. (Manaseer Group, 100%)	Plant at Al Qatranah	3,500,000
Do.	Qatrana Cement Co. (Arabian Cement Co., 100%)	do.	1,800,000
Do.	Northern Cement Co.	Plant at Muwaqar	1,000,000
Clay, kaolin	Al-Faori Enterprise for Mining	Mine at Al-Adasieh	110,000
Do.	Jordan Lafarge Cement Factories Co. P.S.C. (JCFC) (Lafarge S.A., 50.28%; Social Security Corp., 21.86%; others, 27.87%)	Plant at Ar-Rashadiya	300,000
Do.	Jordanian Company for Mining and Processing of Kaolin and Feldspar	Mine at Qanasieh	216,000
Do.	Manaseer Cement and Mining Co. (Manaseer Group, 100%)	Mine at Al Qatranah	400,000
Do.	Middle East Regional Development Enterprises	Mine at Ras En Naqab	10,000 <sup>c</sup>
Do.	Qatrana Cement Co. (Arabian Cement Co., 100%)	Mine at Al Qatrana	400,000
Do.	Public Mining Company Ltd.	Mine at Fuaheis	38,000
Do.	do.	Mine at Batn el-Ghoul	31,000
Feldspar	General Mining Co. Ltd.	Mine at Al-Jaishiah	10,000
Do.	Jordanian Company for Mining and Processing of Kaolin and Feldspar	Mine at Qanasieh	216,000
Gypsum	Al-Nasr Mining Establishment	Mines at Mujib	31,000
Do.	Al-Nisr-Ali Manaseer	do.	89,000
Do.	Al-Noor Mining Co.	do.	11,000
Do.	Falahat Mining Establishment	do.	25,000
Do.	Isam Alshoouly & Maksim	do.	13,000
Do.	Jordan Lafarge Cement Factories Company P.S.C.	Mine at Zarqa	73,000
Do.	Mansour Al Shoabaki Establishment	Mines at Mujib	2,000
Do.	Public Mining Co. Ltd.	do.	68,000
Do.	Shaker Al-Talib Establishment	Mine at Subeih	15,000
Magnesium oxide	Manaseer Magnesia Co. (Manaseer Group, 100%)	Plant at Ghor Al Safi	60,000
Natural gas	million cubic meters National Petroleum Co. (Government, 100%)	Risha Gasfield	150
Petroleum:			
Crude	thousand do. 42-gallon barrels	do.	Hamza Oilfield 8
Refined	do.	Jordan Petroleum Refinery Co. Ltd. (Government, 100%)	Refinery at Zarqa 365,00
Phosphate:			
Phosphate rock	Jordan Phosphate Mines Co. p.l.c. (JPMC) (Indian Potash Ltd., 27.380%; Government Shareholdings' Management Co., 25.655%; Social Security Corp., 16.527%; Kisan International Trading FZE, 9.620; Government of the State of Kuwait, 9.333%; other investors, 11.485%)	Wadi Al-Abiad, Al-Hassa, and Eshidiya Mines	9,000,000
Phosphate, compounds:			
Diammonium phosphate	Jordan Phosphate Mines Co. p.l.c. (JPMC) (Indian Potash Ltd., 27.380%; Government Shareholdings' Management Co., 25.655%; Social Security Corp., 16.527%; Kisan International Trading FZE, 9.620; Government of the State of Kuwait, 9.333%; other investors, 11.485%)	Plant at Industrial Fertilizer Complex, Aqaba	650,000
Do.	Nippon Jordan Fertilizer Co. [Jordan Phosphate Mines Co. p.l.c. (JPMC), 70%; Arab Potash Co. Ltd. (APC), 20%; Mitsubishi Corp., 10%]	Plant at Eshidiya, Ma'an	300,000

See footnotes at end of table.

TABLE 2—Continued  
 JORDAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>Phosphate:—Continued</b>			
<b>Phosphate, compounds:—Continued</b>			
Dicalcium phosphate	Jordan Abyad Fertilizers and Chemicals Co. P.S.C. (JAFCCO) [Jafco Bahrain Co., 42.79%; Jordan Phosphate Mines Co. p.l.c. (JMPC), 25%; Venture Capital Bank, 14.4%; Arab Mining Co., 10%; Sea Field Trading Co., 5%; Al-Faris Investments, 2.81%]	Plant at Al Abyad area, Karak	15,000
Phosphoric acid	Jordan Phosphate Mines Co. p.l.c. (JMPC) (Indian Potash Ltd., 27.380%; Government Shareholdings' Management Co., 25.655%; Social Security Corp., 16.527%; Kisan International Trading FZE, 9.620; Government of the State of Kuwait, 9.333%; other investors, 11.485%)	Plant at Aqaba	350,000
Do.	Jordan India Fertilizer Co. (JIFCO) [Indian Farmers Fertilizers Cooperative of India (IFFCO), 52%, and Jordan Phosphate Mines Co. p.l.c. (JMPC), 48%]	Plant at Eshidiya, Ma'an	475,000
Do.	Indo-Jordan Chemicals Co. Ltd. [Jordan Phosphate Mines Co. p.l.c. (JMPC), 87% , and Arab Investment Co., 13%]	do.	224,000
Triple superphosphate	Jordan Abyad Fertilizers and Chemicals Co. P.S.C. (JAFCCO) [Jaffco Bahrain Co., 42.79%, Jordan Phosphate Mines Co. p.l.c. (JMPC), 25%; Venture Capital Bank, 14.4%; Arab Mining Co., 10%; Sea Field Trading Co., 5%; Al-Faris Investments, 2.81%]	Plant at Al Abyad area, Karak	65,000
<b>Potash:</b>			
Crude salts	Arab Potash Co. (APC) (Government Investments Management Co., 26%; Man Jia Industrial Development Ltd., 26%; Arab Mining Co., 20%; Social Security Corp., 10%; Iraqi Government, 5%; Libyan Company for Foreign Investments, 4%; General Investment Commission, 4%; other investors, 5%)	Plant at Ghor Al Safi	2,450,000
<b>Potassium fertilizers:</b>			
Potassium nitrate	Arab Fertilizers and Chemicals Industries Ltd. (Kempaco) [Arab Potash Co. Ltd. (APC), 100%]	Plant at Aqaba	175,000
Potassium sulfate	Jordan Abyad Fertilizers and Chemicals Co. P.S.C. (JAFCCO) [Venture Capital Bank, 57.2%; Al-Fares Investments, 17.8%; Jordan Phosphate Mines Co. p.l.c. (JMPC), 15%; Arab Mining Co., 10%]	do.	80,000
Salt	Arab Potash Co. Ltd. (APC), 100%	Brines at Ghor Al Safi	17,000
Do.	Amra Salt Co.	Dead Sea Salinas	360,000
Do.	do.	Plant at Abdullah II Ibn Al-Hussein Industrial Estate, Sahab	360,000
<b>Steel:</b>			
Raw	Jordan Steel Co. p.l.c. (Jordan Steel Group, 100%)	Plant at Amman	360,000
Do.	Manaseer Iron and Steel Co. (Manaseer Group)	Billet plant at Amman	200,000
Products, semimanufactured	Jordan Steel Co. p.l.c. (Jordan Steel Group, 100%)	do.	250,000
Do.	Ramco Steel (Hassouneh Steel Group, 100%)	Plant at Al Fayha, Zarqa	220,000
Do.	National Steel Industry Co.	do.	400,000
Do.	Manaseer Iron and Steel Co. (Manaseer Group)	Plant at Amman	200,000
Do.	Petra Steel Industry Co.	do.	120,000
Do.	Taybeh Metal Industries (Taybeh Steel Group, 100%)	do.	300,000
<b>Stone, sand, and gravel:</b>			
Basalt	Jordan Rock Wool Industries Co. Ltd.	Quarry at Qa'a Hanna	5,000
Calcium carbonate	Jordan Carbonate Co.	Mine at Al Jeeza	NA
Do.	Manaseer Carbonate Co. (Manaseer Group, 100%)	Mines at Al Qatranah area, Karak	400,000
Do.	do.	Plant at Manaseer Industrial Complex, Al Damkhi, Karak	350,000
Do.	Qatrana Cement Co. (Arabian Cement Co., 100%)	Mine at Al Qantara, Karak	NA
Do.	Petra Calcium Carbonate Co.	do.	NA
Granite	Manaseer Marble & Granite Co. (Manaseer Group, 100%)	Quarry at Zarqa	5,000

See footnotes at end of table.



TABLE 2—Continued  
 JORDAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Stone, sand, and gravel:— Continued			
Limestone	Arab Company for White Cement Industry [Jordanian Syrian Company for Industry, 50%; General Establishment for Cement (Syria), 25%; Jordan Finance Ministry, 15%; Social Security Corp., 10%]	Mine at Khalidiah	NA
Do.	Sufian Nusair Assoc.	do.	NA
Do.	Khaled Shamayleh Co.	Mine at Siwaqa	NA
Marble	Al Zammar Group	Quarries at Ajloun, Jordan Valley, Karak	NA
Pumice, pozzolanic material	Jordan Lafarge Cement Factories Co. P.S.C. (JCFC) (Lafarge S.A., 50.28%; Social Security Corp., 21.86%; others, 27.87%)	Quarry at Tell Remah	350,000
Do.	do.	Quarry at Aarityan	150,000
Do.	Alialeel for Mining and Extraction of Raw Materials	Quarry at Mafraq	NA
Do.	Modern Cement and Mining Co. (Manaseer Group, 100%)	Quarries at Karak, Tafilah	NA
Sand, industrial	Middle East Regional Development Enterprises	Mine at Ras En Naqab	530,000
Do.	Al-Hababbeh and Sons Company for Mining	do.	28,000
Do.	Al-Rehab for Industrial and Trading Establishment	do.	27,000
Do.	Al-Fares Company for Glass Sand Mining	do.	17,000
Do.	International Silica Industries	do.	NA
Do.	Green Technology Group	Mine at Al-Homaimh	NA
Travertine	Alghor Alawsat Mining Establishment	Quarry at Balqa	NA
Do.	Travertine and Granite Co.	do.	NA
Sulfuric acid	Jordan Abyad Fertilizers and Chemicals Co. P.S.C. (JAFCCO) [Jaffco Bahrain Co., 42.79%; Jordan Phosphate Mines Co. p.l.c. (JMPC), 25%; Venture Capital Bank, 14.4%; Arab Mining Co., 10%; Sea Field Trading Co., 5%; Al-Faris Investments, 2.81%]	Plant at Industrial Fertilizer Complex, Aqaba	132,000
Do.	Jordan Indian Fertilizer Co. (JIFCO) [Indian Farmers Fertilizers Cooperative of India (IFFCO), 52%, and Jordan Phosphate Mines Co. p.l.c. (JPMC), 48%]	Plant at Eshidiya, Ma'an	1,485,000
Do.	Indo-Jordan Chemicals Co. [Jordan Phosphate Mines Co. p.l.c. (JPMC), 87%, and Arab Investment Co., 13%]	do.	730,000
Zeolites	Amana Agricultural & Industrial Co.	Mine at Tel Hesban	NA
Do.	Green Technology Group of Jordan for Mining	Mine at Al Aritayn–Marfaq	NA
Do.	Jordanian Factory for Soil Development & Moisture Drying Co.	do.	NA

Do., do. Ditto. NA Not available.