



2013 Minerals Yearbook

IRAQ

THE MINERAL INDUSTRY OF IRAQ

By Mowafa Taib

In 2013, Iraq was the world's eighth-ranked producer of crude oil. The country produced 3.14 million barrels per day (Mbbbl/d) of crude oil and condensate and accounted for 3.7% of the world's total output. Iraq exported 2.39 Mbbbl/d of crude oil in 2013 and was the world's fourth-ranked crude oil exporter after Saudi Arabia (7.57 Mbbbl/d), Russia (4.71 Mbbbl/d), and the United Arab Emirates (2.70 Mbbbl/d). The country's proved crude oil reserves, which were estimated by the Government to be 150.1 billion barrels (Gbbbl), accounted for 8.9% of the world's total reserves and ranked Iraq as having the fifth largest petroleum reserves in the world after Venezuela (298.3 Gbbbl), Saudi Arabia (265.9 Gbbbl), Canada (174.3 Gbbbl), and Iran (157.0 Gbbbl). Iraq's proved natural gas reserves were estimated to be 3.6 trillion cubic meters, or 1.9% of the world's total reserves (BP p.l.c., 2014, p. 6, 8; Organization of the Petroleum Exporting Countries, 2014, p. 55).

According to a recent study published in the *Houston Geological Society Bulletin*, Iraq has the potential to become the world's leader in hydrocarbon production once its greatly underestimated resources are developed and put into production (Holzman, 2013, p. 23). The study estimates Iraq's hydrocarbon reserves to be 230 Gbbbl in the 84 oilfields that had been identified as of the end of 2004. More-recent crude oil and natural gas discoveries added an estimated 9 to 14 Gbbbl of crude oil, 25.5 billion cubic meters of natural gas in the Kurdistan region of Iraq, and about 6 trillion cubic meters of natural gas in the Western Desert of Iraq to the country's reserves. In 2013, only 29 of the 89 major oilfields were in production (Holzman, 2013, p. 23).

Although Iraq did not mine any metal commodities in 2013, it produced several industrial mineral commodities in modest quantities for local consumption. These mineral commodities included bentonite, cement, clay, gypsum, limestone, nitrogen and phosphate fertilizers, phosphate rock, salt, sand and gravel, silica sand, and sulfur (table 1). The Ministry of Industry and Minerals (MIM) of Iraq estimated the proved mineral resources in the country to be 10 billion metric tons (Gt) of phosphate rock; 8 Gt of limestone; 1.2 Gt of kaolinitic clays; 600 million metric tons (Mt) of native sulfur; 330 Mt of dolomite; 130 Mt of gypsum; 75 Mt of quartz sand; 60 Mt of ironstone; 50 Mt of halite salt; 22 Mt each of bentonite, glauberite, and montmorillonitic clays; 16 Mt of quartzite; 10 Mt of flint clay; 2.3 Mt of feldspathic sandstones; and 1.8 Mt of porcelanite, as well as undetermined resources of attapulgite, barite, bauxite, copper, lead, marble, sand and gravel, sandstone, and zinc (Ministry of Industry and Minerals, 2012).

Minerals in the National Economy

Iraq's gross domestic product (GDP) increased in real terms by only 4.2% in 2013 compared with revised increases of 10.3% and 10.2% in 2012 and 2011, respectively. The Government revenue from the hydrocarbon sector accounted for 44.6%

of the GDP. The value of Iraq's petroleum exports, which accounted for more than 95% of the country's total exports, decreased by 5% in 2013 to \$89.6 billion from \$94.3 billion in 2012. The Organization of the Petroleum Exporting Countries (OPEC) Reference Basket price for Iraq's Basra light crude averaged \$103.60 per barrel in 2013 compared with \$107.96 per barrel in 2012. The near-total dependence on petroleum export revenues and lack of economic diversity made the country susceptible to petroleum shocks, such as sharp changes in crude oil prices on the international markets. Iraq was the leading importer of cement and iron and steel in the Middle East region and the world's ninth-ranked importer of iron and steel in 2013 (International Monetary Fund, 2013, p. 13; Organization of the Petroleum Exporting Countries, 2014, p. 17, 22, 55, 82; World Steel Association, 2014, p. 25).

Government Policies and Programs

In 2013, the Iraq Geological Survey (Geosurv-Iraq) continued to promote 12 investment projects in the industrial mineral sector throughout the country and called for investors to develop mining operations under Investment Law No. 13 of 2006 and its modifications and the Law of Mineral Investment No. 91 of 1988. These potential projects included phosphate rock mining and beneficiation at the Al Hirri Wadi in Al Anbar Governorate and the Swab Wadi; a mining and processing facility for native sulfur deposits at Lazzaga and Mishraq in Ninawa Governorate; a silica sand production plant in Al Anbar Governorate; a feldspar concentrate plant from feldspathic sandstone in An Najaf Governorate; a sodium sulfate production plant to process glauberite, which is associated with gypsum and clays, at Shari Saltern in Salah ad Din Governorate; a sodium carbonate production plant that uses the Solvay process in Al Anbar Governorate; a plant to produce alumina from kaolin using the lime-soda sinter process in Al Anbar Governorate; a ceramic tile and tile-brick plant in Al Anbar Governorate; gypsum mines in Al Anbar, Ninawa, and Wasit Governorates; and a chalk (pure calcium carbonate) mine at the Wadi Al Ghadaf (Iraq Geological Survey, 2014).

As of yearend 2013, a draft of the gas and oil legislation known as the Hydrocarbon Law, which was first proposed in 2007, remained stalled because of disagreements among Iraqi parties on wider political issues, including oil revenue sharing. The proposed law would create an oil and gas council to oversee the country's oil and gas sector and would establish the Iraq National Oil Co. The proposed law also contains arrangements for oil revenue sharing through the creation of an Oil Revenue Fund and a Future Fund. The Government was also planning to issue a new mining law that would attract investors to develop the country's industrial mineral resources.

The Federal Government of Iraq had continued to be engaged in disputes with the Kurdistan Regional Government (KRG;

the ruling body of the federated region in northern Iraq) with respect to oil exports, revenue, and control of land in Diayla, Kirkuk, Ninawa, Salah ad Din, and Wasit Governorates. The Federal Government deemed all crude-oil-related contracts with the KRG illegal, including those signed by major oil companies such as Chevron Corp. and Exxon Mobil Corp. (both of the United States) and Total S.A. (of France), and considered them breaches of existing contracts with Iraq's Ministry of Oil (Devine and Tiller, 2014, p. 11). The Federal Government also was engaged in disputes with the Provincial government of Al Anbar with regard to the development of phosphate rock resources and cement plants in the Al Anbar Governorate (Iraq Business News, 2012).

Production

Data on mineral production are listed in table 1.

Structure of the Mineral Industry

Investment Law No. 13 of 2006 and its modifications and the Law of Mineral Investment No. 91 of 1988 govern mineral sector investment in Iraq. The Mineral Investment Division of Geosurv-Iraq monitors mineral investment operations, environmental protection, and exploration for and production of industrial minerals in Iraq by supplying information, promoting mining projects in both the private and public sectors, and conducting environmental impact studies.

The Ministry of Oil manages activity in Iraq's hydrocarbon sector through a number of state-owned oil companies. The upstream companies included Iraq Drilling Co., Midland Oil Co., Missan Oil Co., North Oil Co., Oil Exploration Co., Oil Project Co., and South Oil Co. The downstream companies included Gas Filling Co., Midland Refinery Co., North Refinery Co., Oil Marketing Co., Oil Pipeline Co., Oil Products Distribution Co., Oil Tanker Co., South Gas Co., South Refinery Co., and State Oil Marketing Organization. Several international oil companies were also working with Iraq's state-owned oil companies to develop Iraq's crude oil and natural gas fields. These companies included, BP p.l.c., of the United Kingdom; China National Petroleum Corp. (CNPC) and CNOOC Ltd. (both of China); Eni S.p.A. of Italy; ExxonMobil of the United States; Gazprom OAO and Lukoil Oil Co. (both of Russia); Petronas Carigali International Sdn Bhd, of Malaysia; Royal Dutch Shell plc of the Netherlands; and Sonangol E.P. of Angola (table 2).

The MIM administered the activity of the hard rock minerals sector through several state-owned companies, including General Company for Phosphate, Iraqi Cement Co., State Company for Iron and Steel, Mishraq Sulphur State Co., Northern Cement State Co., Southern Cement State Co., and State Company for Southern Fertilizer Industry. Geosurv-Iraq produced industrial minerals, including bentonite, clays, feldspar, ironstone, kaolin, salt, and construction and silica sand. In recent years, private companies started to produce cement, gypsum, iron and steel, and other construction materials, especially in the Kurdistan region of Iraq (table 2; Iraq Geological Survey, 2014).

In northern Iraq, the KRG adopted its own hydrocarbon law on August 9, 2007, and awarded 50 crude oil and

natural gas exploration and production licenses to more than 40 international oil companies by yearend 2013 based on production-sharing contracts, which include an initial 5-year exploration period followed by a 20-year development period. The list of U.S. companies that were involved in oil exploration and production in northern Iraq included Aspect Energy LLC, Chevron, ExxonMobil, Hess Corp., Hillwood International Energy L.P., HKN Energy Ltd., Hunt Oil Co., Impulse Energy Corp., Marathon Petroleum Corp., Murphy Oil Corp., Prime Oil Co., Texas Keystone Inc., and Viking International (a subsidiary of Viking Services). Canadian companies included Forbes and Manhattan, Ground Star Resources Ltd., Longford Energy Inc., NIKO Resources, Sharman Petroleum, Talisman Energy Inc., Vast Exploration Inc., and Western Zagros Resources Ltd. Companies from the United Kingdom included First Reserve Corp., Heritage Oil plc., Niko Resources Ltd., Norbest Ltd., Perenco Oil and Gas, Pet Prime International Oil Co. Ltd., and Sterling Energy p.l.c. Turkish companies included Doğan Enerji, Genel Enerji A.S., Petroleum Products International Exploration and Production Inc. Companies from the Republic of Korea included Daesung Corp., Korea National Oil Corp. (KNOC), Le Meilleur Co. Ltd., Majuko Corp., Samchully Co., SK Energy Co. Ltd., and UI Energy Corp. Other companies that operated in the area included Crescent Petroleum and Dana Gas (both of the United Arab Emirates); DNO International ASA of Norway; Hungarian Oil and Gas Public Ltd. Co. (MOL); Komet Group of Moldova; Maersk Oil Co. of Denmark; Oil Search Ltd. of Papua New Guinea; OMV Aktiengesellschaft of Austria; Petroceltic International p.l.c. of Ireland; Reliance Industries Ltd. of India; Repsol Oil Co. of Spain; and Total of France (Ministry of Natural Resources of Kurdistan Regional Government—Iraq, 2014).

Mineral Trade

Iraq was one of the world's top exporters of crude oil in 2013. The volume of its crude oil and petroleum products exports increased slightly by 1.2% to 2.455 Mbbbl/d in 2013 from 2.425 Mbbbl/d in 2012. The country was also one of the world's top importers of iron and steel products in 2013, and it was the ninth-ranked importing country of steel in the world. Iraq's steel products imports amounted to 4.5 Mt compared with 4.0 Mt in 2012. Iraq's trade with Iran reached \$12 billion in 2013, which was the same as the value of its trade with Turkey (Al-Hayat, 2014; Organization of the Petroleum Exporting Countries, 2014, p. 82).

U.S. exports to Iraq were valued at \$2 billion in 2013, of which \$338 million was for civilian and military aircraft; \$260 million, for vehicles; \$257 million, for drilling and oilfield equipment; \$163 million, for industrial engines; \$109 million, for industrial machines; \$101 million, for measuring, testing, and control instruments; \$96 million, for power generators; and \$51 million, for excavation machinery. U.S. imports from Iraq, which peaked in 2012 and were almost entirely crude oil imports, decreased by 31% to \$13.3 billion from about \$19.3 billion in 2012. The decrease was attributed to a general decrease in imports of crude oil by the United States because of increased domestic production (U.S. Census Bureau, 2014).

Commodity Review

Metals

Iron and Steel.—Iraq's iron and steel sector attracted several international steel companies and investors because of the increased demand for steel products to satisfy the country's needs in the construction and hydrocarbon sectors. Iraq's steel imports had been increasing in recent years; the country imported 4.5 Mt of semifinished and finished steel products in 2013 compared with 4.0 Mt in 2012 (World Steel Association, 2014, p. 27).

In 2012, the State Company for Iron and Steel (SCIS) signed a final agreement with UB Holding Ltd. of Turkey under which UB Holding would invest \$700 million during 18 years to rebuild the SCIS steel complex at Khawr az Zubayr in Al Basrah Governorate. The project, which would be implemented in three phases and completed in 2016, was expected to produce 1.3 million metric tons per year (Mt/yr) of iron and steel products. The SCIS complex was damaged during the war in 2003 and had remained idle since (Iron and Steel State Co., 2013).

Mass Iraq Iron and Steel Industry Co. (a subsidiary of Mass Group Holding Ltd. of Jordan) moved forward with building a new 1.25-Mt/yr steel plant in As Sulaymaniyah in northern Iraq at an estimated cost of \$1.25 billion. The plant would include a 120-t-capacity electric arc furnace (EAF), a ladle furnace, and a five-strand continuous caster supplied by the Danieli Group of Italy. The plant was being built in three phases; phase 1 would include construction of a plant that would have the capacity to produce 600,000 metric tons per year (t/yr) of steel reinforcing bar (rebar) from direct-reduced iron (DRI) and scrap. Phase 2 would add production of another 650,000 t/yr of rebar by the end of 2015, and phase 3 was expected to double production of rebar to 2.5 Mt/yr when completed by the end of 2015 (Mass Group Holding Ltd., 2014).

As of yearend 2013, no information was found concerning progress or followup on the previously announced joint venture between ArcelorMittal of Luxembourg and Dayen Co. of Turkey to build a steel minimill with an EAF. The project, which was announced in 2010, had been scheduled to start production in 2011, but production was delayed until 2013, and the site of the plant was moved to Erbil from As Sulaymaniyah. Similarly, no followup reports were found on the progress of Jindal SAW Ltd. of India's plan to build and operate a plant to produce gas and oil pipes in southern Iraq or the plans by CVS Rolling Mill (a subsidiary of CVS Technologies) of Turkey to install machinery for a new 500,000-t/yr-capacity EAF melt shop and a 420,000-t/yr-capacity rebar mill (Steel Guru, 2012; Steel Orbis, 2012).

Industrial Minerals

Bentonite.—Beijing Trading and Development Co. of China built a bentonite-activation plant at Fallujah in Al Anbar Governorate. The plant converts calcium-based bentonite into sodium-based bentonite for use as a drilling mud for oil and gas wells. The plant was expected to tap into Iraq's 22 Mt of bentonite reserves, which are calcium-based and are located in the Traifawi area in the Western Desert. The plant would

have an initial capacity of 75,000 t/yr of sodium-activated bentonite (which could be increased to 100,000 t/yr) and was expected to be completed in 2013. As of yearend 2013, there were no confirmations or updates on the completion or the commissioning of the plant (Iraq Geological Survey, 2012).

Cement.—Consumption of cement has been increasing at an annual rate of 15% in recent years. It was projected that the country's consumption of cement would be 35 Mt/yr, whereas its production capacity would be 22 Mt/yr by the end of 2014. The tonnage of Iraq's cement imports also had been increasing steadily in recent years owing to the massive construction activity in the country's commercial, industrial, and residential sectors. Iraq became the leading importer of cement in the Middle East by importing about 12 Mt/yr of cement, or 65% of the country's total consumption. Cement imports came mainly from Iran, Turkey, and Saudi Arabia (Annous, 2012, p. 22; Global Cement, 2013e).

In 2013, Lafarge (Iraq's leading producer of cement) had 5.8 Mt/yr of cement production capacity in Iraq, which accounted for 24% of the country's capacity. Lafarge operated three plants at Bazian and Tasluja in As Sulaymaniyah Governorate in northern Iraq and at Karbala in southern Iraq, respectively. Lafarge and Faruk Group Holding were joint owners of Bazian Cement Co. and Union Cement Co., which operated the Bazian and the Tasluja cement plants, respectively. Karbala Cement Manufacturing Co. (KCMC), which was a joint venture of Lafarge (51%) and Merchant Bridge Co. of the United Arab Emirates (49%), was responsible for the rehabilitation of the Karbala cement plant, which is located in Karbala Governorate in southern Iraq. The plant's capacity was increased to 1.8 Mt/yr of cement from 576,000 t/yr (Annous, 2012; O'Sullivan, 2012; Lafarge S.A., 2014, p. 34).

In April 2013, Lucky Cement Co. of Pakistan said that it was building a greenfield cement grinding facility in Basrah, Iraq. The grinding plant would be a 50–50 joint venture with the Al Shawy family and would have the capacity to produce 0.8 Mt/yr of cement. The plant was expected to start production in April 2014. Lucky also planned to build an integrated cement plant in Basrah with the capacity to produce 1.25 Mt/yr of cement (Global Cement, 2014).

In 2012, Sinoma International Engineering Co. Ltd. of China signed a contract with the Faruk Group to build a greenfield cement plant in As Sulaymaniyah city in northern Iraq. The \$180 million plant would have the capacity to produce 1.8 Mt/yr of cement. In August, Sinoma signed an agreement with Gebr Pfliffer S.E. of Germany to supply of five clinker grinding plants for installation in northern Iraq (Global Cement, 2013f, g).

In August, ASEC Cement of Egypt and Qemmet El-Iraq were awarded a 14-year contract by the MIM to manage and renovate the Muthanna cement plant, which is located in the Muthanna Governorate in southern Iraq. The plant had 2 Mt/yr of cement production capacity when it was built in the 1990s, but the current capacity has decreased to 400,000 t/yr because the plant was not maintained during the 1990s when Iraq was under economic sanctions. The joint venture expected to start the restoration of the plant's original capacity of 2 Mt/yr in 2014 and to complete the plant's renovation by August 2016. In May, The Islamic Republic News Agency of Iraq reported that Iran

planned to install a new cement plant in Iraq. The plant would cost \$425 million and have the capacity to produce 2 Mt/yr of cement; it would begin production in 2015 (Global Cement, 2013a, b).

In July, the Government banned cement imports from Iran. The reason for the ban was attributed to protection of domestic cement producers. Cement imports, however, resumed shortly after the ban was announced. Iraq had been importing between 7 Mt/yr and 11 Mt/yr of cement from Iran. In September, the Government banned imports of white cement, but there were no indications as to the effects of the decision on local markets or whether the ban was upheld or lifted (Global Cement 2013c, d).

Nitrogen.—In 2013, three companies had the capacity to produce ammonia and urea in Iraq—State Enterprise for Fertilizer and Petrochemical (South), State Company for Fertilizers Northern Area, and 1st Global Company for Chemical Fertilizers Production Ltd. Production by these companies remained well below capacity because of old equipment at the two state-owned companies and insufficient natural gas allocation. The MIM called for investing in three new urea plants in the Governorates of Al Anbar, Al Basrah, and Ninawa, respectively. The proposed capacity at each of the new plants was between 500,000 t/yr and 1 Mt/yr of urea, and the cost to construct each plant would be between \$800 million and \$900 million. Natural gas needed as a feedstock for these plants would be available in all locations (Arab Fertilizer Association, 2014, p. 21, 25; State Company for Fertilizers, 2014).

Phosphate Rock.—Al Anbar Council, which is the ruling body of the Al Anbar Governorate, planned to develop its vast phosphate rock deposit in Akashat by building a phosphate rock concentration facility. The Federal Government in Baghdad, however, refused to approve the plan and referred it to the Ministry of Oil. The Al Anbar Council then sued the Federal Government for blocking the development of the phosphate plant. The State Company for Phosphate's phosphate rock production remained well below its production capacity of 3.4 Mt/yr. Most of Iraq's phosphate rock deposits occur in the Paleocene Akashat Formation in Iraq's Western Desert. The deposits are located about 15 to 20 kilometers (km) northeast of the Akashat Mine and cover an area of 40 square kilometers (km²). Geosurv-Iraq estimated Iraq's phosphate reserves and resources to be 9.53 Gt. The Akashat deposit was estimated to hold 430 Mt of proved phosphate rock reserves grading 21.52% P₂O₅. There were also indicated resources at the Swab deposit, which held an estimated 3.50 Gt of phosphate rock grading 21.71% phosphorus pentoxide (P₂O₅), followed by the Dawima site, 2.76 Gt grading 20.56% P₂O₅; the Marbat deposit, 2.11 Gt grading 21.17% P₂O₅; the Ethna site, 430 Mt grading 17.50% P₂O₅; the H3 site, 313 Mt grading 17.50% P₂O₅; and the Hirri site, 193 Mt grading 21.94% P₂O₅ (Al-Bassam and others, 2012, p. 18; Iraq Business News, 2012; State Company for Phosphate, 2014).

Sulfur.—Mishraq Sulphur State Co. (MSSC) was a state-owned company established to mine sulfur from the Mishraq underground sulfur deposit in the Qaiyarah area, which is located 45 km southeast of the city of Mosul, Ninawa Governorate. Sulfur was produced using the Frasch process, which melts native sulfur by injecting into it streams of hot water and extracting the melted sulfur with air pressure pumps.

The company produced alum (hydrated potassium aluminum sulfate), pure sulfur, sulfur fertilizer, and sulfuric acid. In 2013, MSSC began renovating the Mishraq sulfur mine to increase the production capacity to 500,000 t/yr of sulfur. MSSC contracted Devco Corp. of the United States to supply submerged combustion technology equipment. Financing of the project was supported by a loan guarantee from the Export-Import Bank of the United States (Devco Corp., 2014).

Mineral Fuels

Natural Gas.—Production of gross natural gas in Iraq increased by 4.4% to 21.4 billion cubic meters in 2013 compared with that of 2012; of this total, dry gas output was 1.18 billion cubic meters, which was an increase of 83% from that of 2012, according to OPEC statistics (table 1; Organization of the Petroleum Exporting Countries, 2014, p. 33). In May, South Gas Co., which was a 25-year joint venture of South Gas Co. (51%), Royal Dutch Shell (44%), and Mitsubishi Corp. of Japan (5%) formed to capture flared gas from a 19,000-km² area in Al Basrah Governorate, started operations at the Basrah Gas project, which is also known as the South Gas Project. The project was expected to be the largest gas project in Iraq's history and the world's largest flares reduction project, according to Royal Dutch Shell. The project area included the Rumaila, the West Qurna 1, and the Zubair oilfields. Natural gas would be captured, treated, and processed for use locally or exported as liquefied natural gas. Natural gas production from the project was expected to increase from about 11 million cubic meters per day (reported as 400 million cubic feet per day) to about 57 million cubic meters per day (reported as 2 billion cubic feet per day) by 2017 (Mirza, 2013; Royal Dutch Shell plc, 2014).

In the Kurdistan region of Iraq, natural gas production by Pearl Petroleum Co. Ltd. (PPCL) from the Chemchemal and the Khor Mor fields averaged more than 10.8 million cubic meters per year. PPCL was a joint venture of Dana Gas PJSC (40%) and Crescent Petroleum (40%), both of the United Arab Emirates, and MOL Hungarian Oil and Gas Co. p.l.c. (MOL) (10%) and OMV Aktiengesellschaft (10%). The project supplied two gas-fired power stations at Chemchemal and Erbil and planned to transport surplus gas to Europe through the Nabucco gas pipeline, which was to be built in the near future. Dana Gas had been producing liquefied petroleum gas (LPG) through two LPG trains at the Khor Mor gas processing plant since 2011. The company had been supplying LPG and condensates by way of a 180-km pipeline to powerplants at Chemchemal and Erbil from the Khor Mor field. In 2013, PPCL continued natural gas and LPG production from the Khor Mor field and moved forward with evaluating the Chemchemal and the Khor Mor reservoirs to increase its production capacity for local needs and for export (Dana Gas P.J.S.C., 2014).

OMV began a drilling program at the Bina Bawi 3 (BB3) exploration well in January and encountered several hydrocarbon-bearing layers. The company planned to drill an exploration well in the Mala Omar Block, make progress in the appraisal of the Bina Bawi Block, conduct tests at the Rovi and the Sarta Blocks, and evaluate test results at the BB3 well (OMV Aktiengesellschaft, 2014, p. 10, 38).

The Governments of Iran and Iraq agreed to build a natural gas pipeline that would transport natural gas from Iran to Iraq; the pipeline was expected to be completed by March 2014. In the initial phase, 7 million cubic meters per day of natural gas could be delivered to Iraq, and in the final phase, up to 40 million cubic meters per day could be delivered. The pipeline would be 100 km in length and 1.2 meters in diameter and would run from Charmaleh in Kermanshah Province in Iran, to the town of Naft Shahr on the border with Iraq (Tehran Times, 2014).

Petroleum.—In 2013, Iraq was OPEC's third-ranked producer of petroleum after Saudi Arabia and Iran. The number of active rigs in the country decreased to 83 in 2013 from 92 in 2012. The number of crude-oil-producing wells in Iraq increased to 1,735 in 2013 from 1,700 wells in 2012, and the number of completed wells increased to 313 in 2013 from 228 wells in 2012 (Organization of the Petroleum Exporting Countries, 2014, p. 25–27).

Estimates for Iraq's crude-oil-refining capacity in 2013 increased to 830,000 barrels per day (bbl/d) from 820,000 bbl/d in 2012. The output of petroleum products increased by 3.6% to 601,000 bbl/d in 2013 from 580,000 bbl/d in 2012. The Federal Government planned to increase the country's refining capacity to more than 1.5 Mbb/d by 2017 by building four new refineries at Karbala (140,000 bbl/d), Kirkuk (150,000 bbl/d), Maysan (150,000 bbl/d), and Nasiriyah (300,000 bbl/d) as well as by expanding the capacities at the Basrah and the Daura refineries. Construction on the long-planned Karbala refinery in southern Iraq was expected to take place in early 2014. The \$6 billion project was being built by a consortium, led by Hyundai Engineering and Construction, that included GS Engineering and Construction and SK Engineering and Construction (all of the Republic of Korea) (U.S. Energy Information Administration, 2013; BP p.l.c., 2014, p. 16; Oil and Gas Journal, 2014; Organization of the Petroleum Exporting Countries, 2014, p. 25–27, 36, 41).

In 2013, DNO continued with its exploration and drilling of areas covered by the Tawke production-sharing contract (PSC) and the Dohuk PSC in the Kurdistan region in northern Iraq. Production from the Tawke oilfield reached 75,000 bbl/d, and the company estimated that the crude oil and natural gas reserves of the Tawke field exceeded 500 million barrels. DNO, which was the first company to discover crude oil in the Kurdistan region of Iraq in 2006, began exporting oil from the Tawke field in 2011. DNO had interests in two other licenses in the Kurdistan region of Iraq. In 2013, the company was working on increasing production from the Tawke field, drilling exploration wells in the Dohuk PSC and the Tawke PSC license areas, and preparing a declaration of commerciality for the Benenan-3 well on the Erbil license and the Bastora oilfields discovery (DNO International ASA, 2014).

In July, Afren p.l.c. of the United Kingdom purchased stakes in two Kurdistan operations for \$588 million. The deal was expected to generate 75,000 bbl/d of crude oil from the Barda Rash PSC within 5 years. Barda Rash is located 55 km northwest of Erbil and operated by Afren, which held a 60% working interest. The company also acquired a 20% working interest in the Ain Sifni PSC, which is located 70 km northwest of Erbil and operated by Hunt Oil Co. of the United States (Afren p.l.c., 2013).

Outlook

In 2014, disputes between the Federal Government of Iraq and the KRG concerning oil exports and revenue and the control of oilfields in Kirkuk continued to escalate, with international oil companies being threatened with legal action by the Federal Government and the KRG, both of which claimed lost revenue from oil shipments. This situation, coupled with the takeover of the city of Mosul and other areas in the Al Anbar and Ninawa Governorates by the self-proclaimed Islamic State of Iraq and Levant, created uncertainty among international oil companies involved with the country's mineral sector (Watts, 2014). The outlook for the mineral sector depends largely on Iraq's political future and its ability to form a national government capable of protecting the interests of all Iraqi stakeholders. Nevertheless, the amount of activity in the mineral industry in Iraq is expected to increase considerably in the short and medium terms to meet increased demand for mineral commodities needed to restore the country's infrastructure and to develop the country's hydrocarbon sector. Production of such mineral commodities as cement, crude oil, fertilizer, limestone, natural gas, phosphate rock, refined petroleum products, steel, and sulfur are expected to increase in the next few years.

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TABLE 1
IRAQ: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2009	2010	2011	2012	2013
INDUSTRIAL MINERALS					
Bauxite	250	3,350	--	--	--
Bentonite ²	3,959	6,127	6,472	6,530 ^r	6,288
Cement, hydraulic ^e	thousand metric tons	7,000	8,000	10,000	10,000
Clay	do.	2,283	2,283	33,013	33,380
Gypsum ³	do.	626	728 ^r	713 ^r	1,369 ^r
Iron oxide pigments	do.	300	3,000	--	--
Kaolin	do.	1,980	20,060	--	--
Limestone:					
For cement	thousand metric tons	2,005	986	4,086	4,648
For construction	do.	NA	NA	585	326
Nitrogen:					
N content of ammonia	do.	30	126	143	143
N content of urea	do.	NA	100	129	129
Phosphate rock, gross weight	do.	NA	139	122	250
Phosphate fertilizer	do.	NA	331	429	450
Salt	do.	113	102	136	143
Sand and gravel ²	do.	10,834	10,139	21,300	23,181
Silica sand ²	do.	17,514	232	173	1,439
Sulfur ^e	thousand metric tons	20	20	20	20
MINERAL FUELS AND RELATED MATERIALS					
Gas, natural:					
Gross	million cubic meters	16,577	16,885	18,692	20,496
Dry	do.	1,149	1,303	877	646
Natural gas plant liquids	thousand 42-gallon barrels	15,000	16,000	16,400	16,400
Petroleum:					
Crude, including condensate	do.	891,330	905,200	1,022,365	1,136,975
Refinery products:					
Liquefied petroleum gas	do.	2,482	3,139	3,285	3,614
Gasoline	do.	21,937	26,207	27,521	27,886
Kerosene and jet fuel	do.	17,477	19,892	31,901	16,242
Distillate fuels	do.	31,208	37,339	47,486	46,574
Residual fuels	do.	76,979	89,973	79,278	103,076
Other	do.	16,609	24,945	44,370	14,308 ^r
Total	do.	166,692	201,495	233,841	211,700 ^r

^eEstimated; estimated data are rounded to no more than three significant digits. ^rRevised. do. Ditto. NA Not available. -- Zero.

¹Table includes data available through January 31, 2015.

²Reported in cubic meters and converted to metric tons.

³Reported in cubic meters and converted to metric tons, includes only primary gypsum.

TABLE 2
IRAQ: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement:				
Portland		Southern Cement State Co. (Government, 100%)	Al Basrah plant, An Najaf Al Ashraf plant, Kufa plant, Muthanna plant, Nora plant, As Samawa plant	7,500,000.
Do.		Iraqi Cement Co. (Government, 100%)	Al Qaim plant, Al Qaim; Kirkuk Kirkuk; Fallujah plant, Fallujah; and Kubaisa plant, Kubaisa	5,200,000.
Do.		Northern Cement State Co. (Government, 100%)	Al Tamin plant, Badoosh I, II, and III plants, Mosul; Hammam Al Aleel I and II plants, Mosul; and Sinjar Mosul	3,740,000.
Do.		Bazian Cement Company (Lafarge S.A., 70%, and Faruk Group Holding, 30%)	Bazian plant at Sarchinar, near Hayasi	2,700,000.
Do.		United Cement Company (Lafarge S.A., 60%, and Faruk Group Holding, 40%)	Tasluja plant, near Sulaymaniyah	2,300,000.
Do.		Karbala Cement Manufacturing Co. (Lafarge S.A., 51%, and Merchant Bridge Co., 49%)	Karbala plant, Karbala Governorate	1,800,000.
White		Iraqi Cement Co. (Government, 100%)	Fallujah white cement plant, Fallujah	300,000.
Gypsum		Al Ahlia Gypsum Industrial Co. Ltd., Al Ameen Gypsum Production Co. Ltd., Al Ma'moon Building Materials Co. Ltd., Al Rashid Gypsum Co. Ltd., and Al Shemal Gypsum Industries Co. Ltd.	Baghdad	1,368,750.
Iron and steel ¹		State Company for Iron and Steel (Government, 100%)	Khawr az Zubayr, Al Basrah Governorate	NA.
Natural gas	million cubic meters	Pearl Petroleum Co. Ltd. (PPCL) (Crescent Petroleum, 40%, Dana Gas PJSC, 40%, MOL Hungarian Oil and Gas Co. p.l.c. (MOL), 10%, OMV Aktiengesellschaft, 10%)	Chemchemical and Khor Mor fields, Kurdistan-Iraq	350.
Nitrogen	thousand metric tons	State Enterprise for Fertilizer and Petrochemical (South) (Government, 100%)	Ammonia plant at Abu Al-khasib	230 ammonia; 350 urea.
Do.	do.	State Company for Fertilizers Northern Area (Government, 100%)	Plant at Bayji, Salaheddin	231 ammonia; 202 urea.
Do.	do.	1st Global Company for Chemical Fertilizers Production Ltd. (private, 100%)	do.	369 ammonia; 400 urea.
Petroleum:				
Crude	thousand 42-gallon barrels per day	BP p.l.c., 38%; China National Petroleum Corp. (CNPC), 37%; South Oil Co., 25%	Rumaila, Al Basrah Governorate	1,350.
Do.	do.	China National Petroleum Corp. (CNPC), 75%, and North Oil Co., 25%	Al-Ahdab, Wasit Governorate	140.
Do.	do.	China National Petroleum Corp. (CNPC), 37.5%; South Oil Co., 25%; Petronas Carigali International Sdn Bhd, 18.75%; Total S.A., 18.75%	Halfaya, Maysan Governorate	70.
Do.	do.	CNOOC Ltd., 63.75%; Iraq Drilling Co., 25%, and Türkiye Petrolleri Anonim Ortaklığı (TPAO), 11.25%	Maysan, Maysan Governorate	450.
Do.	do.	DNO International ASA, 55%; Genel Enerji A.S., 25%; Kurdistan National Oil Co., 20%	Tawke, Kurdistan region	100.
Do.	do.	Exxon Mobil Corp., 60%; Royal Dutch Shell plc, 15%; Oil Exploration Co., 25%	West Qurna 1, Al Basrah Governorate	400.

See footnotes at end of table.

TABLE 2—Continued
IRAQ: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum—Continued:				
Crude—Continued	thousand 42-gallon barrels per day	Eni S.p.A., 32.81%; Missan Oil Co., 25%; Occidental Petroleum Corp., 23.44%; Korean Gas Corp. (Kogas), 17.75%	Zubair, Al Basrah Governorate	270.
Do.	do.	Gazprom OAO, 30%; Oil Exploration Co., 25%; Korean Gas Corp. (Kogas) 22.5%; Türkiye Petrolleri Anonim Ortaklığı (TPAO), 7.5%	Badra, Wasit Governorate	170.
Do.	do.	Lukoil Oil Co., 56.25%; South Oil Co., 25%; Statoil ASA, 18.75%	West Qurna 2, Al Basrah Governorate	NA.
Do.	do.	North Oil Co. (Government, 100%)	Kirkuk, Kirkuk Governorate	280.
		Petronas Carigali International Sdn Bhd, 45%; Japex Garraf Ltd., 30%; North Oil Co., 25%	Garraff, Dhi Qar Governorate	35.
Do.	do.	Royal Dutch Shell plc, 45%; Petronas Carigali International Sdn Bhd, 30%; Missan Oil Co., 25%	Majnoon, Al Basrah Governorate	18.
Do.	do.	Sociedade Nacional de Petróleos de Angola (Sonagol), 75%, and South Oil Co., 25%	Qaiyarah, Ninawa Governorate	120.
Do.	do.	do.	Najmah, Ninawa Governorate	110.
Do.	do.	Taq Taq Operating Co. Ltd. (Genel Enerji A.S., 55%, and Addax Petroleum Corp., 45%)	Taq Taq, Kurdistan region	105.
Refinery products	42-gallon barrels per day	Midland Refineries Co. (Government, 100%)	Daura refinery at Daura	140,000.
Do.	do.	do.	An Najaf Governorate	30,000.
Do.	do.	do.	Samawah	30,000.
Do.	do.	do.	Diwanya	20,000.
Do.	do.	North Refineries Co. (Government, 100%)	Baiji	230,000.
Do.	do.	do.	Kirkuk	30,000.
Do.	do.	do.	Haditha	16,000.
Do.	do.	do.	Qaiyarah	16,000.
Do.	do.	do.	Kasak	10,000.
Do.	do.	South Refineries Co. (Government, 100%)	Al Basrah Governorate	135,000.
Do.	do.	do.	Nasiriyah-Samawah	30,000.
Do.	do.	do.	Missan	20,000.
Do.	do.	Kar Oil & Gas Co. (private, 100%)	Kalak, Erbil	80,000.
Do.	do.	Bazian refinery (Qaiwan Group, 100%)	As Sulaymaniyah	20,000.
Phosphate rock		General Company for Phosphate (Government, 100%)	Mines at Akashat, Al Anbar Governorate	3,400,000.
Phosphatic fertilizer ^{2,3}		do.	Plant at Al-Qaim	600,000 TSP; 280,000 MAP; 650,000 NPK.
Phosphoric acid ¹		do.	do.	400,000.
Sulfur		Mishraq Sulphur State Co. (MSSC) (Government, 100%)	Qaiyarah	820,000.
Sulfuric acid ¹		do.	do.	500,000.
Do.		General Company for Phosphate (Government, 100%)	Phosphatic fertilizer plant at Al-Qaim	1,500,000.

Do., do. Ditto. NA Not available.

¹No production has been reported since 2003.

²The fertilizer production unit U400 produced triple superphosphate (TSP), monoammonium phosphate (MAP), and compound fertilizer (NPK).

³Fluoride salts production unit U500, which had the capacity to produce 11,000 metric tons per year of aluminum fluoride, was idle for technical problems but was being used to produce unknown quantities of ammonium chloride, pure silica, silica gel, sodium fluorosilicate, sodium phosphate, and zeolites.