



# 2014 Minerals Yearbook

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## SUDAN

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# THE MINERAL INDUSTRY OF SUDAN

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Sudan is one of the largest countries in Africa, with a diverse geology and large quantities of mineral resources. Sudan was one of the leading gold-producing countries in Africa in 2014. A small number of mineral commodities were mined in the country, and mine output was not proportional to the size of the country's mineral resources and reserves. In 2014, crude oil and gold were the country's main mineral exports, along with modest quantities of chromite, petroleum products, and scrap metals. Other mineral commodities produced in Sudan included cement, feldspar, fluorite, gypsum, iron and steel, kaolin, laterite, manganese, marble, salt, silver, and zinc (table 1; Central Bank of Sudan, 2015, p. 210).

Seven mineral districts in Sudan were identified by the Ministry of Minerals as having good potential for mining operations. The Red Sea Hills area in northeastern Sudan has copper, gold, iron ore, rare-earth elements, silver, and zinc mineral occurrences, as well as black sands, garnet, gypsum, salt, and talc deposits. Estimates of major mineral resources in the Red Sea Hills area included 500,000 metric tons (t) of contained copper, 150 t of contained gold, 4,500 t of silver, and 1.9 million metric tons (Mt) of contained zinc. The Beyoda desert, which is located in north-central Sudan, contains feldspar, gold, iron ore, kainite (aluminum silicate), manganese, marble, mica, and silica deposits. The Jebel Marra volcanic field, which is located in western Sudan, hosts deposits of base metals, garnet, kainite, salt, and sulfur. The Jebel Abyad and Jebel Wahib regions in northern Wadi Hawar have the potential to produce bauxite, chromite, gold, and platinum-group metals. The Ingessana polymetallic complex in the State of Blue Nile in southeastern Sudan has asbestos, chromite, gold, magnesite, marble, and talc occurrences. The Nuba Mountains, located in South Kordofan, host important mineral commodities, including such metals as chromium, copper, gold, iron, manganese, and nickel; such industrial minerals as graphite, marble, phosphate rock, and talc; and uranium as an energy mineral. The Copper Pit mineral district, which is located in the State of South Darfur in southwestern Sudan, is prospective for copper, gold, precious stones, and uranium mining (Ministry of Minerals, 2014b, p. 10–11, 15–16).

## Minerals in the National Economy

Sudan's real gross domestic product (GDP) increased by 3.6% in 2014 compared with 4.4% in 2013. In terms of value, the manufacturing sector, which included the electricity, mining and quarrying, petroleum, and water subsectors, increased by 15.2% and accounted for 24% of the GDP in 2014 compared with 10.4% and 21.6%, respectively, in 2013. The value of the petroleum sector, which accounted for 3.4% of the country's GDP, increased by 36.5% in 2014 compared with an increase of 23.2% in 2013 despite a 6% decrease in the volume of crude oil output; that of the mining sector, which contributed 0.8%

to the GDP, increased by 11.4% in 2014 compared with an increase of 34% in 2013; and that of the construction sector, which contributed 4.2% to the GDP, increased by 5.8% in 2014 compared with an increase of 2.0% in 2013 (Central Bank of Sudan, 2015, p. 118).

In 2014, Sudan's mineral exports, which included chromite, crude oil and refined petroleum products, gold, and ferrous and nonferrous scrap metals, accounted for about 59% of total exports. Crude oil exports decreased in value and volume to about \$1.1 billion and 11.1 million barrels (Mbbbl), respectively, from \$1.6 billion and 15.8 Mbbbl, respectively, in 2013. Gold exports increased in value and volume to about \$1.3 billion and 30.45 t, respectively, in 2014 from \$1.0 billion and 24.81 t, respectively, in 2013. The United Arab Emirates received 88% of Sudan's gold exports. Refined petroleum product exports increased to \$163 million from \$102 million, and other mineral commodity exports, which included chromite, decreased to \$17.3 million from \$18.9 million. Chromite exports by tonnage increased to about 42.9 t in 2014 from 17.3 t in 2013 and 2.6 t in 2012. Scrap metal exports, which comprised copper, iron, and lead scrap materials, totaled 10.4 t valued at \$157,000 in 2014 compared with 50.0 t valued at \$38,000 in 2013 (Central Bank of Sudan, 2015, p. 139, 158, 210).

## Government Policies and Programs

Presidential Decree no. 22 of 2010, no. 22 of 2012, and no. 45 of 2013 designate the Ministry of Minerals as the Government agency responsible for mineral exploration and geologic surveys in Sudan and its territorial waters. The Ministry of Minerals implements Government policies and programs and promotes investment in the mining sector. The Ministry also issues mining permits, signs contracts on behalf of the Government, and monitors activities by mining companies throughout the country. The Ministry of Minerals has branch offices at Atbara in the State of River Nile, El-Damazin in the State of Blue Nile, Nyala in the State of South Darfur, and Port Sudan in the State of Red Sea. Additional offices were planned at El Obeid in the States of Northern Kordofan, Gedaref, Gezira, Kassala, and in Northern State.

The Mineral Resources Development and Mining Law of 2007 states that the Government has ownership and absolute rights to explore for and mine all mineral materials in the country. This law also defines traditional mining (artisanal mining) as mining activities carried out by groups and individuals without the use of heavy machinery to a maximum depth of 20 meters (m) (Abd Al Rahman, 2014).

The Government, which completed the construction of the country's first gold and silver refinery at Khartoum in 2012, banned the export of unrefined gold in order to increase foreign exchange and the Central Bank of Sudan's holdings of gold reserves. The Government claimed that 75% of gold

production by artisanal miners, who are responsible for 85% of the country's gold production, was smuggled out of the country instead of being sold to the Government. Gold smuggling was attributed to the unfavorable official exchange rate of the Sudanese pound against the U.S. dollar (compared with the unofficial rate) that the Central Bank used to buy locally produced gold (Sudan Tribune, 2014).

The latest update on U.S. sanctions against Sudan, which were initiated in 1997, was on November 5, 2013. Investment in Sudan's petroleum and petrochemical industries by U.S. individuals and organizations was banned by Executive Order 13412, which was issued by the President of the United States on October 13, 2006. The alleged use of revenues from petroleum sales to finance military operations in the Darfur conflict constituted the primary reason for the Executive order. U.S. individuals and organizations were banned from participating in the refining of South Sudan's crude petroleum in refineries located in Sudan (U.S. Department of the Treasury Office of Foreign Assets Control, 2013).

## Production

In 2014, the main increases in Sudan's mineral commodity production included that of chromite (99%), salt (79%), feldspar (60%), kaolin (30%), refined gold (25%), and mined gold (about 5%). Notable decreases in mineral commodity output were for laterite (86%), manganese (66%), gypsum (16%), and marble (10%). Zinc output of 46 t was reported for the first time in 2014. Mica production was zero in 2014 compared with 500 t in 2013 owing to exhaustion of resources at the Sheriek Mines (table 1).

## Structure of the Mineral Industry

Crude oil production was carried out by joint ventures of state-owned companies from China, India, and Malaysia with Sudan. The Government wholly owned three petroleum refineries, but the country's largest refinery, Khartoum Oil Refinery Co. Ltd., was a joint venture between China National Petroleum Corp. (CNPC) and Sudan National Petroleum Corp. (Sudapet). The Government owned Sudanese Mining Corp., which in turn owned Ingessana Hills Mining Corp. and Sheriek Mica Mines Co., which produced chromite, gypsum, and mica. The Government also owned Sudan Gold Refinery Co. Ltd. and the Ariab Mining Co. Ltd., which operated the Hassai gold mine in northern Sudan. Cement plants were privately owned.

The recent gold rush in Sudan created opportunities for the startup of several companies that supported various activities associated with gold production by an estimated 1 million artisanal miners. Sudan's mining sector comprised 160 large-scale mining companies, 190 small-scale mining companies, and 34 tailings-processing companies engaged in exploration. Twelve large-scale companies, 43 small-scale companies, and 15 tailings-processing companies were active in minerals (mainly gold) production, and 2 large-scale companies and 6 tailings-processing companies were involved in pilot studies. Additionally, 370 companies carried out general prospecting studies. The Government awarded more than 350 small-scale

mining licenses for the production of alluvial gold, chromite, feldspar, fluorite, gypsum, iron ore, manganese, mica, salt, silica sand, and talc (Elsamani, 2015, p. 15; Ibrahim, 2015, p. 7).

Golden United Group (a group of private companies) focused on gold production, but it also produced some basalt and chromite through its subsidiaries—Abu Rugia Mining, Alhamdeen Mining, Alhsour Mining, Exseer Mining, Monas Mining, Rida Mining, and Wedian Mining (Golden United Group, 2015; Kumar, 2015, p. 2).

In February, the Ministry of Minerals issued licenses to nine companies from Russia to explore for and develop mining operations to produce black sands, chromite, gold, and other minerals. The Ministry predicted that these companies would begin pilot production within a short time despite their recent entry into Sudan's mining market (Sudan Vision, 2015).

## Commodity Review

### Metals

**Chromium.**—Production of chromite ore was carried out in the Ingessana area, which is located in the State of Blue Nile. Mineral resources were estimated to be about 1 Mt grading up to 60% Cr<sub>2</sub>O<sub>3</sub>. Chromium occurrences were found in the Red Sea Hills area in the northeast, in the Nuba Mountains in the south, and in Northern State. Chromite ore production by Ingessana Hills Mines Corp. almost doubled in 2014 to 61,334 t from 30,870 t in 2014 from the Ingessana Hills ophiolite in southeastern Sudan. In the absence of production information from Ingessana Hills Mines Corp., the chromite production data in table 1 were based on the Central Bank of Sudan's estimates, which appeared to be based on export data rather than on actual production, which might explain the discrepancy between chromite ore output reported by the Ministry of Minerals in 2012 and that reported by the Central Bank of Sudan (Ministry of Minerals, 2014b, p. 36, 45; Central Bank of Sudan, 2014, p. 141; 2015, p. 139).

**Copper, Gold, and Zinc.**—According to the Central Bank of Sudan's latest statistics, the country produced 73,300 kilograms (kg) of gold in 2014 compared with 70,000 kg in 2013. Gold mining companies were responsible for 9,720 kg of the output in 2014 compared with 5,800 kg in 2013. Artisanal miners produced 63,655 kg of gold in 2014. The Government projected that gold production would increase to 80,000 kg in 2015 and 100,000 kg in 2016. Thomson Reuters GFMS Gold Survey estimated that mined gold production in Sudan in 2014 was 20,500 kg, which was much less than Government estimates. The difference appeared to be related to the inclusion of gold produced by artisanal miners in the Government estimates. Artisanal miners, who accounted for most of Sudan's gold production, were required to sell their gold production directly to the Central Bank of Sudan, which in turn transferred it to the country's gold refinery at Khartoum. Most of the gold produced by artisanal miners in Sudan was thought to be smuggled out of the country and consequently was not accounted for in the GFMS Gold Survey. The difference between Sudan's gold production and its exports, which was about 43,000 kg in 2014, was held by the Central Bank of Sudan as gold reserves and by corporations and individuals as an investment

(Sudan Tribune, 2014; Central Bank of Sudan, 2015, p. 89, 139; Thomson Reuters, 2015, p. 27).

In 2014, the Government reported that 10 companies produced gold in Sudan and that the number of gold-producing companies was expected to increase to 21 by 2015. These companies included Ariab Mining, Delgo Minerals Co., Koch of Russia, Golden United Group, Hagagia (Poly Red Sea) Gold Mining Co. Ltd., Huakan Mining Co. of China, Managem Group of Morocco, Omdurman Mining Co., Rida Mining Co., Sahari Company for Gold Mining, and Tahi International Metal Mining Corp. of the British Virgin Islands (table 2; Africa Intelligence, 2014).

In 2014, Ariab Mining operated the Hassai Mine in northeastern Sudan, which was the leading large-scale gold mine in the country. La Mancha Holding S.àr.L owned a 44% share in Ariab Mining in 2014, and was in the process of selling its share to the Government in 2015. Ariab Mining produced 1,775 kg of gold in 2014 compared with 1,546 kg in 2013. Since 1992, total production at the Hassai Mine was about 80,000 kg of gold from mining the upper gold-rich oxidized cap rock of multiple deposits. Exploration at depth was planned at Hassai owing to the impending depletion of near-surface deposits. The company completed a definitive feasibility study to build a carbon-in-leach plant to treat the substantial amount of tailings accumulated during more than 30 years of mining. Ariab Mining also completed a prefeasibility study to build a flotation plant to treat the volcanic massive sulfide (VMS) deposits underlying the current open pits. The company planned to mine 12.2 Mt to obtain 19,362 kg of gold and 93,060 kg of silver during the next 5 years. The VMS project was expected to develop the Hadal Awatib East, the Hadayamet, and the Hassai South properties, where the mineral resources (combined) were estimated to be 117 Mt grading 1.22 grams per metric ton (g/t) gold, 1.12% copper, and 0.67% zinc. Mineral resources at the Hadal Awatib East deposit were estimated to be 67.5 Mt containing 74,764 kg of gold, 706 t of copper, and 508 t of zinc. Mineral resources at the Hassai South properties were about 42 Mt containing 61,329 kg of gold, 525 t of copper, and 122 t of zinc; and those at the Hadayamet site were 7.8 Mt containing 7,236 kg of gold, 79 t of copper, and 784 t of zinc (Abdalla, 2015, p. 14, 17–19; La Mancha, 2015).

Managem Group of Morocco continued exploration for gold in Blocks 9, 15, and 24 through its subsidiary MCM Sudan. The company planned to start construction of a new gold mine at Mining Block 15, which is located in northeastern Sudan, after completing a feasibility study. Resources at Wadi Gadgaba in Mining Block 15 were estimated to be more than 120,000 kg of contained gold. Managem planned to produce about 10,000 kilograms per year of gold by early 2017 (Otmame, 2013).

In September, Orca Gold Inc. of Canada completed its second drilling program at the Galat Sufar South (GSS) and the Wadi Doum (WD) prospects in Block 14, which are located in northeastern Sudan. Indicated and inferred mineral resources at the GSS deposit were updated to 26.4 Mt grading 1.77 g/t gold and 8.64 Mt grading 1.7 g/t gold, respectively. Initial indicated and inferred resources at the WD prospect were estimated to be 1.30 Mt grading 3.02 g/t gold and 1.63 Mt grading 2.2 g/t gold, respectively. The company drilled 62,321 m and 8,751 m

at the GSS and WD sites, respectively, in 2014 and planned to spend \$5 million on exploration in 2015 (Orca Gold Inc., 2015, p. 4, 9, 13).

Tahi International operated the Abu Sara Gold Mine in Block 17 at Hamasana in the State of Red Sea. Mineral resources at the mine were estimated to be 4.7 Mt grading 3.07 g/t gold. The company estimated that 110 t (3.5 million troy ounces) of gold could be produced from the mine based on available drilling and geologic information (Tahi International Metal Mining Corp., 2015).

Sahari Company for Gold Mining began gold production at Berber in the State of River Nile. The company was the third company that was permitted to mine for gold, after Ariab Mining and Rida Mining Co. Sahari's concession area covered 2,600 square kilometers (km<sup>2</sup>) and contained an estimated 14,500 kg of gold at its eight mines. The company invested \$29 million and used a carbon-in-leach gold recovery plant to minimize the potential for environmental damage (Ministry of Minerals, 2013).

**Iron Ore.**—Iron ore deposits have been evaluated by Sudan's General Authority for Geological Research in several regions in the country. The Gaab and the Bagrawiya oolitic iron ore deposits in northern Sudan were the largest iron ore deposits in the country and were estimated to contain 15 billion metric tons (Gt) grading 45% iron and 5 Gt grading 40% iron, respectively. The Argin and Wadi Halfa oolitic iron ore deposit in Northern State was estimated to hold 100 Mt grading 40% iron. Other iron ore deposits in the country were the Gallabat deposit in the State of Gedaref, the East Khartoum and the West Khartoum deposits in the State of Khartoum, the Sofaya deposit in Red Sea Hills, the Abu Tulu Gossans metallogenic province in the State of West Kordofan, and the Ed el Fursan banded iron formation in the State of South Darfur (Mohamed Ali, 2014).

### *Industrial Minerals*

**Cement.**—Cement production in Sudan decreased slightly by 1.7% to about 3.5 Mt in 2014 compared with that of 2013. Sudan had eight major cement plants with a total (combined) capacity of 10.3 million metric tons per year. The Ministry of Minerals listed the following four additional plants in the State of River Nile: Bee Cement Factory, Heleith Cement Factory, MAM Cement Factory, and Raira Cement Factory. From 2010 to 2014, the country's cement production increased to 3.5 Mt from 1.9 Mt (table 2; Central Bank of Sudan, 2015, p. 142).

In 2014, Al-Rajhi Group produced about 1.2 Mt of cement; Al-Shamal Cement Factory, 945,800 t; Berber Cement Co. Ltd., 531,900 t; ASEC Cement Co. of Egypt (a subsidiary of Qalaa Holdings S.A.E. of Egypt), 438,400 t; Al-Salam Cement Production Co. Ltd., 242,600 t; Aslan Cement Co., 81,100 t; and Nile Cement Co. Ltd., 47,800 t. Increased production at Al-Shamal was offset by decreased production at other cement plants in the country (Central Bank of Sudan, 2015, p. 141–142).

**Clay and Shale.**—Laterite, which has low iron content and high clay content, was used for brick production. Many brick plants were located near Khartoum. In 2014, reported laterite production decreased sharply to 46,579 t from 339,390 t in 2013

and 96,400 t in 2012. The decrease was attributable to decreased demand by the construction sector (Central Bank of Sudan, 2015, p. 142).

**Phosphate Rock and Potash.**—In 2013, Regency Mines plc of the United Kingdom and International Minerals Resources Ltd. (Agrominerals Sudan) signed an agreement to explore for phosphate mineralization at Block PHOS 7 in the Jebel Abyad basin in Northern State and for potash at the Red Sea Hills in the northeast. The Red Sea potash project (Block RS 9) covered 499 km<sup>2</sup> and was located 200 km north of Port Sudan. In August, the company completed a preliminary advanced spaceborne thermal emission and reflection radiometer (ASTER) study of the Jebel Abyad concession and, in October it started exploration work at Block RS 9 (Regency Mines Plc, 2015, p. 3, 5, 10, 51).

**Stone, Dimension.**—Sudan's marble production decreased to 900 cubic meters in 2014 from 1,000 cubic meters in 2013 (table 1). The main marble occurrences in Sudan are located in the Derdudeib, Marsh Arkuyai, and Minan regions in the State of Red Sea, the Es Semeih area in the State of North Kordofan, the Nayfer er Rugayig area in the State of White Nile, the Rashad area in the State of South Kordofan, and the West Berber-Atbara area in the State of River Nile (Ministry of Minerals, 2014a).

### **Mineral Fuels**

**Petroleum.**—In 2014, Sudan's production of crude petroleum decreased to 42.4 Mbbbl from 45.1 Mbbbl in 2013. The volume of refined petroleum products produced increased slightly in 2014 compared with that of 2013 (table 1; Central Bank of Sudan, 2015, p. 137). The Greater Nile Petroleum Operating Co. [CNPC (40%), Petronas Carigali Overseas Shd. Bhd. of Malaysia (30%), ONGC Videsh Ltd. of India (25%), and Sudapet (5%)] produced crude petroleum in Blocks 1, 2, and 4 in West Kordofan in south-central Sudan. After the referendum on South Sudan's independence from Sudan, Blocks 1, 2, and 4 were divided between Sudan and South Sudan. The Bamboo, Bamboo West, Diffra, Garaad, Hadida, Heglig, and Neem Taiyib oilfields are located in Sudan. In late 2014, Star Oil Co. [Ansan Wikfs Investments Ltd. of Yemen (66%) and Sudapet (34%)] produced crude oil at the Al-Barasaya oilfield in Block 17 at the rate of 11,000 barrels per day (bbl/d) (U.S. Energy Information Administration, 2014).

The Khartoum oil refinery at Jali in northern Sudan was operated by CNPC, and had the capacity to produce 100,000 bbl/d. The Port Sudan refinery was owned by the Government and had the capacity to produce 21,700 bbl/d. The country also had three small-scale refineries (topping plants)—the El-Obeid refinery, which had the capacity to produce 10,000 bbl/d, the Shajirah refinery (10,000 bbl/d), and the Abu Gabra refinery (2,000 bbl/d). The Government planned to increase the capacity at the Khartoum oil refinery to 200,000 bbl/d, and that of Port Sudan and El-Obeid, to 50,000 bbl/d each (U.S. Energy Information Administration, 2014).

### **Outlook**

Many of Sudan's mineral resources have yet to be explored and developed. The Government has focused on gold mining as

a way to offset the revenue lost from petroleum production in South Sudan, which became an independent country in 2011. Based on Government statistics, Sudan was the third-ranked producer of gold in Africa in 2014, after South Africa and Ghana (Sudan Tribune, 2015). The scenario could be realized if more than 130 mining companies, of which 15 are international, begin production by 2015. Production of manganese and zinc was reported recently by the Government, and production of these mineral commodities is expected to increase in the short term.

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

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2010	2011	2012	2013	2014
<b>METALS</b>					
<b>Chromite:</b>					
Gross weight	56,823	64,128	75,000 <sup>r</sup>	30,870	61,334
Cr <sub>2</sub> O <sub>3</sub> content	23,866	26,934	31,500 <sup>r</sup>	12,965	25,760
<b>Gold:</b>					
Mine output, Au content	26,317	23,739	46,133	70,000 <sup>r</sup>	73,300
Refined	--	--	9,000 <sup>e</sup>	24,000 <sup>e</sup>	30,000 <sup>e</sup>
Manganese ore	--	--	-- <sup>e</sup>	3,250	1,100
<b>Silver:</b>					
Mine output, Ag content	631	700 <sup>r</sup>	700 <sup>r</sup>	700 <sup>r</sup>	700 <sup>e</sup>
Refined <sup>e</sup>	--	--	200	700 <sup>r</sup>	700
Steel, semimanufactured <sup>e</sup>	580,000	400,000	400,000	400,000	400,000
Zinc, mine output, Zn content	--	--	--	--	46
<b>INDUSTRIAL MINERALS</b>					
Cement, hydraulic	1,929,700	3,002,300	3,511,000	3,538,000 <sup>r</sup>	3,477,700
Feldspar	923	9,519	26,283	31,700	50,680
Fluorite	-- <sup>r</sup>	50 <sup>r</sup>	10,000 <sup>r</sup>	-- <sup>r</sup>	--
Gypsum	31,000	13,000	117,073	132,000	111,271
Kaolin	32,696	15,096	11,579	26,000	33,770
Laterite	NA	24,500	96,400	339,390	46,579
Marble	1,625	1,214	115	1,000	900
Mica	10	378	324	500	--
Quartz	-- <sup>r</sup>	-- <sup>r</sup>	5,292	-- <sup>r</sup>	--
Salt	141,840	10,791	26,315	20,800	37,295
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
<b>Petroleum:</b>					
Crude, including condensate <sup>3</sup>	168,656	106,216	37,737	45,100 <sup>r</sup>	42,400
<b>Refinery products:</b>					
Liquefied petroleum gas	3,798	3,617	3,217	3,357 <sup>r</sup>	3,729
Gasoline	10,593	9,811	9,381	8,582 <sup>r</sup>	9,077
Naphtha	180	177	75	156 <sup>r</sup>	139
Jet fuel	1,059	1,062	935	635 <sup>r</sup>	857
Kerosene	196	186	62	150	131
Distillate fuel oil	17,489	15,460	12,600	11,894	10,760
Residual fuel oil	1,732	1,830	663	1,698 <sup>r</sup>	1,954
Petroleum coke	1,774	1,571	1,477	1,408	1,299
Total	36,821	33,714	28,410	27,880	27,946

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>r</sup>Revised. do. Ditto. -- Zero.

<sup>1</sup>Table includes data available through August 25, 2015.

<sup>2</sup>In addition to the commodities listed, clay and shale; construction aggregate and fill, lime, limestone, sand and gravel, and stone presumably were produced, but available information was inadequate to make reliable estimates of output.

<sup>3</sup>For 2011, South Sudan's production is included only for the period before independence on July 9; it is not included for the years 2012–14.

TABLE 2  
SUDAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners		Location of main facilities	Annual capacity
Cement	Atbara Cement Company Ltd. (Al-Rajhi Group, 100%)		Plant at Atbara	1,850,000
Do.	ASEC Cement Co. (Citadel Capital S.A.E., 100%)		Plant at Takamol	1,600,000
Do.	Berber Cement Company Ltd.		Plant at Berber	1,580,000
Do.	Aslan Cement Co.		NA	1,500,000
Do.	Nile Cement Co. Ltd.		Plant at Rabak	1,500,000
Do.	Al-Shamal Cement Factory (Mass Global Investment Co.)		Plant at Atbara	1,480,000
Do.	Al-Salam Cement Production Co. Ltd.		do.	660,000
Do.	Sudanese Cement Factory		Plant in Blue Nile State	100,000
Chromite	Ingessana Hills Mines Corp. [Sudanese Mining Corp. (Government, 100%)]		Mine at Ingessana Hills	75,000
Do.	Salfi Co. Ltd.		NA	NA
Do.	Golden United Group		Mines at Inqasna Mountain, and Blue Nile State	NA
<b>Gold:</b>				
Mined	kilograms	Artisanal miners	Jebel Amir mines in North Darfur State	15,000 <sup>e</sup>
Do.	do.	do.	Various locations	60,000 <sup>e</sup>
Do.	do.	Ariab Mining Co. Ltd. (Government, 56%, and La Mancha Holding S.àr.L, 44%)	Mine at Hassai	1,800
Do.	do.	Delgo Minerals Co.	NA	NA
Do.	do.	Huakan Mining Co.	Hamadi gold mine	NA
Do.	do.	Hagagia (Poly Red Sea) Gold Mining Co., Ltd.	NA	NA
Do.	do.	Managem Group	Atbara	NA
Do.	do.	Omdurman Mining Co.	Omdurman	NA
Do.	do.	Rida Mining Co. (Rida Engineering and Construction Co. Ltd.)	Balabdi, River Nile State	NA
Do.	do.	Sahari Company for Gold Mining	Berber, River Nile State	2,000
Do.	do.	Tahi International Metal Mining Corp.	Mine at Abu Sara	NA
Refined	do.	The Sudan Gold Refinery Co. (Government, 100%)	Refinery at Khartoum	270,000
Gypsum	Sudanese Mining Corp. (Government, 100%)		Bir Eit Mine in Red Sea State	15,000
<b>Iron and steel:</b>				
Crude steel	Sudan Master Technology		Plant at Giad Industrial City	60,000
Rebar	Al-Assad Steel Bar Factory		Plant at Khartoum	394,000
Do.	Sudan Master Technology		Plant at Giad Industrial City	150,000
Do.	Sudanese Steel Products Ltd. (subsidiary of Hafez Elsayad Barbary Ltd.)		Plant at Khartoum	150,000
Do.	Sudanese Malaysian Factory		do.	100,000
Galvanized steel	Sudanese Steel Products Ltd.		do.	20,000
Limestone	Al-Salam Cement Production Co. Ltd.		Mine in River Nile State	730,000 <sup>e</sup>
Do.	Al-Rajhi Group		Mine at Atbara	500,000
Do.	Nile Cement Company Ltd.		Mine at Rabak	200,000
Manganese	NA		Berber	75,000
Mica	Sheriek Mica Mines Co. [Sudanese Mining Corp. (Government, 100%)]		Mines at Sheriek	1,800 <sup>1</sup>
<b>Petroleum:</b>				
Crude	thousand 42-gallon barrels	China National Petroleum Corp., 95%	Block 6 near Muglad	26,000 <sup>e</sup>
Do.	do.	Greater Nile Petroleum Operating Co. [China National Petroleum Corp. (CNPC), 40%; Petronas Carigali Overseas Shd. Bhd., 30%; ONGC Videsh Ltd., 25%; Sudan National Petroleum Corp. (Sudapet), 5%]	Blocks 2 and 4 in West Kordofan State	4,015
Do.	do.	Star Oil Co. [Ansan Wikfs Investments Ltd., 66%, and Sudan National Petroleum Corp. (Sudapet), 34%]	Block 17 in South Kordofan State	4,000

See footnotes at end of table.

TABLE 2—Continued  
SUDAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum—Continued:				
Refined	thousand 42-gallon barrels	Khartoum Oil Refinery [China National Petroleum Corp. (CNPC), 50%, and Sudan National Petroleum Corp. (Sudapet), 50%]	Refinery at Jali	36,500
Do.	do.	Port Sudan Refining Ltd. (Government, 100%) El-Obeid Refinery (Government, 100%)	Refinery at Port Sudan Refinery at El-Obeid	7,920 3,650
Do.	do.	Concorp Petroleum Ltd.	Refinery at Shajirah	3,650
Do.	do.	Abu Gabra Refinery Co. [Sudan National Petroleum Corp. (Sudapet), (Government, 100%)]	Refinery at Abu Gabra	730
Salt		Bittar Salt Company Ltd. (El-Nilein Holding Co., 100%)	Mine at Port Sudan	100,000
Silver, refined	kilograms	The Sudan Gold Refinery Co. (Government, 100%)	Refinery at Khartoum	60,000
Zinc		Ariab Mining Co. Ltd. (Government, 56%, and La Mancha Holding S.àr.L, 44%)	Mine at Hassai	50

<sup>c</sup>Estimated. Do., do. Ditto. NA Not available.

<sup>1</sup>Mine closed in 2013.