

THE MINERAL INDUSTRY OF

TURKEY

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Turkey's economy rebounded from the economic and financial crisis of 2001. The gross domestic product (GDP) grew by 7.8% in 2002 compared with a 7.5% drop in 2001 and was projected to grow by 5.3% in 2003 (International Monetary Fund, 2003¹). The country's GDP (based on purchasing power parity) was estimated to be about \$468 billion in 2002. Inflation was pegged at an annual rate of 45% in 2002, which was down from 54% in 2001 and 85% in 1998. The country had an estimated population of 67 million settled within its 780,580-square-kilometer area (U.S. Central Intelligence Agency, 2003§).

Turkey had a diverse mineral industry that featured a robust industrial minerals sector. The nation was a leading producer of barite, boron minerals, celestite (strontium), chromite, emery, feldspar, limestone, magnesite, marble, perlite, and pumice and was a significant source of value-added processed mineral commodities, which included refined borates and related chemicals, cement, ceramics, glass, and steel. Mining and quarrying accounted for about 1.2% of the GDP; much of the mineral industry's contribution to the economy, however, was in the processed commodity sector, which was lumped in Turkey's manufacturing statistics. In 2002, manufacturing accounted for 24.7% of the GDP (State Institute of Statistics, 2003a§).

Linking Asia and Europe, Turkey also has emerged as a major energy transit corridor. The Iran-Turkey gas pipeline moved Iranian gas into Turkey. The Blue Stream Pipeline, which transited beneath the Black Sea from Dzhugba, Russia to Samsun, Turkey, was to begin supplying Russian natural gas to Turkey in 2003. The proposed South Caucasus gas pipeline was to deliver Azerbaijani natural gas to Turkey in 2006. Connection of the natural gas pipelines with the European gas network would provide an alternative route to allow surplus Eurasian natural gas to flow into Europe. Turkey hosted the western section of the Iraq-Turkey pipeline, which, in 2002, moved 175 million barrels of Iraqi crude oil to the Çeyhan oil export facilities at Yumurtalik. The Yumurtalik docks also were the proposed terminus of the Baku-Tbilisi-Çeyhan oil pipeline.

Trade

In 2002, total Turkish exports were valued at \$35.8 billion compared with \$31.3 billion in 2001. Total imports were valued at \$51.3 billion in 2002 compared with \$41.4 billion in 2001 (State Institute of Statistics, 2003b§). The European Union (EU) received 51.5% of Turkish exports (by value); countries of the Middle East, 9.8%; and the United States, 9.2%. In 2002, the EU accounted for 45.5% of total Turkish imports (by value); the Middle East, 7.1%; and the United States, 6% (State Institute of Statistics, 2003c§-e§). Turkey was a candidate for EU membership; accession negotiations could begin in late 2004 (Commission of the European Communities, 2003§).

In 2002, exports of mineral- and chemical-based commodities and products were valued at about \$5.5 billion. These were predominately iron and steel exports (bars, billets, pipes, flat rolled products, sections, and wire), which were valued at about \$3 billion. Exports included iron and steel bars, which were valued at \$886 million; mineral fuels and petroleum products, \$661.8 million; jewelry, \$591.3 million; steel billet, \$555 million; glass and glassware, \$466 million; steel pipe, \$320 million; steel wire rod, \$235 million; inorganic chemicals, \$219 million; worked marble and travertine, \$219 million; cold-rolled flat steel, \$124 million; steel sections and profiles, \$118 million; hot-rolled flat steel, \$117 million; aluminum bars and profiles, \$110 million; plated or coated flat steel, \$91 million; borates and concentrates, \$90 million; aluminum flat products, \$87 million; copper wire, \$66 million; steatite and talc, \$62 million; marble, onyx, and travertine blocks and slabs, \$59 million; copper ores and concentrates, \$50 million; feldspar, \$44 million; and magnesite, \$37 million. Compared with 2001, lead ore and concentrate exports increased by almost 258% to \$6.6 million in 2002. Other commodities with significant changes in the value of exports in 2002 compared with 2001 included ferrochrome, with almost a 124% increase to \$27 million; iron oxide pigment, a 119% increase to \$4 million; steatite and talc, a 90% increase; steel billet, a 65% increase; quartz, about a 63% increase to \$4 million; salt, about a 59% increase to \$2 million; mineral fuels, oils, and products, a 53% increase; plated or coated flat steel, about a 49% increase; jewelry, a 38% increase; worked marble and travertine, a 38% increase; marble, onyx, and travertine blocks and slabs, a 28% increase; blister copper, about a 24% decrease to \$9 million; cold-rolled flat steel, about a 24% decrease; hot-rolled flat steel, a 26% decrease; and copper wire, about a 34% decrease (Istanbul Mineral and Metals Exporters' Association, 2003a§-c§).

Structure of the Mineral Industry

The private sector dominated the country's industrial mineral and metal exploration sectors in 2002. Private sector enterprises included exploration and production companies owned by domestic and foreign stockholders, mining or manufacturing subsidiaries of Turkish conglomerates, and medium and small privately owned mining companies. State-owned companies remained significant producers of borates, fuels, and metallic ores.

¹References that include a section mark (§) are found in the Internet References Cited section.

The Ministry of Energy and Natural Resources oversaw the mineral industry. All mineral rights were reserved to the Government. The Government promoted foreign investment in the development of most mineral commodities, and the industrial minerals, the metals, and the mineral fuels sectors all received some foreign investment. International mineral companies formed local subsidiaries because only Turkish citizens, Turkish corporate entities, and State mining companies could hold mining claims under Article 6 of the Turkish Mining Law of 1985. In 2002, the majority of foreign investment in the mineral industry was channeled into funding gold exploration compared with the 1990s when it was directed towards acquiring interest in the cement companies that the Government privatized. The gold sector remained focused on legal developments concerning the Ovacık Mine of Newmont Madencilik A.Ş. Repeated lawsuits have challenged the Government's authority to issue permits that allow Newmont to use cyanide.

The Government had embarked on a privatization program in 1989 to promote more-efficient allocation of Government resources. The financial burden of Government-owned companies on the national budget had overpowered the societal benefits that the state-owned companies accrued as significant employment centers. Reduction of the state's involvement in the industrial and other sectors of the economy has expanded the capital market as domestic and foreign interests acquired ownership interest in the companies. The Privatization Administration was responsible for implementing preparations for the privatization of Government-owned companies. In 2002, mineral operations held by the Privatization Administration included the barite grinding plant, the chrome mines, and the ferrochrome and ferrosilicon plants of Eti Elektrometalurji A.Ş.; the copper mines of Eti Bakir A.Ş.; the copper smelter of Karadeniz Bakir İşletmeleri A.Ş.; the ferrochrome plant of Eti Krom A.Ş.; the fertilizer companies of Türkiye Gübre Sanayii A.Ş.; the iron ore mines of Divriği Hekimhan Madenleri Sanayi ve Ticaret A.Ş.; the petroleum refineries of Türkiye Petrol Rafineleri A.Ş. (TÜPRAŞ); the domestic and foreign steel operations of Ereğli Demir ve Çelik Fabrikaları T.A.Ş.; the steel plant of Türkiye Demir ve Çelik İşletmeleri A.Ş.; and the silver mine and plant of Eti Gümüş A.Ş. The divestment of Government-owned mineral enterprises slowed in 2002 when the privatization of TÜPRAŞ was postponed until 2003. Other mineral companies scheduled to be privatized in 2003 included Eti Bakir, Eti Gümüş, Eti Krom, and Türkiye Gübre.

Commodity Review

Metals

Chromium.—The operation of Eti Krom's four high-carbon ferrochromium furnaces, which were located about 50 kilometers east of Elazığ, was temporarily suspended in 2001 and remained idle in 2002. The temporary closure of the furnace activity also adversely affected the mining companies that had contracted to supply ore to Eti Krom. In 2002, exports of high-carbon ferrochrome came from stockpiled material. Improved international market conditions were anticipated in 2003, and Eti Krom expected to restart one or two of its furnaces.

Copper.—Despite a 6-week suspension of mining after a series of ground falls in October, Çayeli Bakir İşletmeleri A.Ş. [the joint venture of Inmet Mining Corp. (55% equity interest) and Eti Holdings A.Ş. (45%)] reported that 895,000 metric tons (t) of ore was milled and that concentrates which contained 32,600 t of copper and 33,100 t of zinc were recovered in 2002 compared with 33,000 t of copper and 25,300 t of zinc in concentrates produced in 2001. After rehabilitation of the main access ramp, ore production was resumed in December 2002 at about 50% of capacity. Çayeli expected to resume production at full capacity by March 2003. In 2002, the company completed a new tailings pipeline and proposed a 3-year program to deepen the main shaft, to expand plant capacity to 1.25 million metric tons per year (Mt/yr), and to move its concentrate export facilities from Rize to a new port (Inmet Mining Corp., 2003, p. 10-11; International Finance Corporation, 2003§).

Gold.—In 2002, Newmont Madencilik was formed after Newmont Mining Corp. of the United States acquired Normandy Mining Ltd. of Australia (and its Turkish subsidiary Normandy Madencilik A.Ş., which had operated the Ovacık Mine near Bergama). As the first foreign-operated mine to use cyanide to recover gold, the Ovacık Mine continued to be a target for legal action. In 2002, the mine operated under temporary licenses pending the appeal of a June 2001 judicial order that canceled Ovacık's operating permits. Revocation of Ovacık's operating permits could adversely affect the development of most of the other proposed gold mines. Gold production from the Ovacık operation was more than 3,900 kilograms. In 2003, production from Ovacık's underground operations was scheduled to supplement ore from the open pit (Newmont Mining Corp., 2003, p. 23, 57, 144; Arol, 2002§).

In 2002, the Yeni Anadolu Mineral Madencilik San. ve Tic. Ltd. Şti. (YAMAS) (a subsidiary of Anatolia Minerals Development Ltd. of the United States) joint venture with Rio Tinto Mining and Exploration Ltd. continued to explore for gold in Turkey. Activity included drilling and metallurgical studies of recovered material on the Cöpler (formerly the Çükürdere) prospect and aeromagnetic, stream sediment geochemistry, and geologic studies on the Tunceli prospect. The joint venture also explored the Central Anatolia and the K-C District prospects. YAMAS also explored the Gelemic, the Kabataş, the Karagöz, the Tufanbeyli, and the Üçkapılı properties.

Tüprağ Metal Madencilik San. ve Tic. Şti. (a subsidiary of Eldorado Gold Corp. of Canada) completed a 29-hole, 7,600-meter (m) reverse circulation drill program and about 3,000 m of core and infill drilling on its Kisladağ gold prospect. Hatch Associates Ltd. was awarded the contract for a feasibility study that was expected to be completed in March 2003. Preliminary design of the operation envisioned ore production of 5 Mt/yr for 4 years with an expected output of 4,400 kilograms per year (kg/yr) of gold followed by an increase to 7,200 kg/yr of gold associated with an expansion of the mine and processing facilities to a throughput of 10 Mt/yr of ore (Eldorado Gold Corp., 2002; Northern Miner, 2002).

Odyssey Resources Ltd. of Canada continued to acquire mineral properties in Turkey. In 2002, Odyssey agreed to acquire the rights to the Altintepe gold property from Cominco Madencilik Sanayii A.S. in addition to the Kabataş copper-molybdenum-gold and the Korgon gold properties from the Turkish Government and the Trab 23 copper-gold-molybdenum property from BHP Billiton World Exploration Inc. In June, Odyssey announced that it had entered into a joint-venture agreement with BHP Billiton to explore for copper and gold in eastern Turkey. In December, Yıldız Arama ve Madencilik San. ve Tic. A.Ş. (a local subsidiary of Odyssey) began a diamond drill program at Altintepe.

Iron and Steel.—In 2002, steel production jumped about 11% to 16 million metric tons (Mt); Ereğli Demir ve Çelik Fabrikaları T.A.Ş. accounted for 4.45 Mt (Metal Bulletin, 2003a). To feed their electric arc furnaces, Turkish steelmakers imported from about 6 to 8 Mt/yr of ferrous scrap. In recent years, they had turned to Romania, Russia, Western Europe, and the Ukraine for much of their scrap needs (Metal Bulletin, 2003c). In late 2002, the Turks again became significant importers of ferrous scrap from the United States. Total ferrous scrap imports from the United States in 2002 was 495,905 t compared with 1.83 Mt from Ukraine, 1.80 Mt from Russia, 1.25 Mt from Romania, and 1.03 Mt from the Netherlands. Steel minimills in Turkey had been a leading market for U.S. steel scrap in the early 1990s. Turkish imports of ferrous scrap from the United States had been about 1.2 Mt in 1994, 1.3 Mt in 1993, and 1.8 Mt in 1992 (Metal Bulletin, 2003b).

In December 2002, Ukraine announced that it would charge a tariff of 30 euro (€) per metric ton (about \$30 per metric ton at the average exchange rates of December 2002) on ferrous scrap exports effective January 1, 2003, which was expected to reduce the demand from Turkish steel mills. Russia had imposed a 15% tariff on ferrous scrap exports in 1999. At yearend, the price of Russian export scrap was about \$120 per metric ton (Cundy, 2002).

Lead and Zinc.—In early 2002, Yıldız continued its diamond drilling program on the Lucky Star lead-zinc prospect. Mixed conclusions from the analysis of the Lucky Star's mineralization resulted in Odyssey's shift in exploration interest toward gold.

Nickel.—European Nickel plc of the United Kingdom entered the Turkish mining sector in December when it acquired an option on the Caldag nickel deposit, which is located near Izmir. European Nickel formed Bosphorus Nickel Mining Ltd. to mine about 480,000 metric tons per year (t/yr) of nickel-cobalt ore that was to be shipped to Larco G.M.M.S.A., which was a ferronickel producer in Greece (Mining Journal, 2002).

Industrial Minerals

Boron.—Unlike most of the mining operations of state-owned Eti Holding A.Ş., the boron establishments were not transferred to the Privatization Administration. Eti Bor A.Ş. (a subsidiary of Eti Holdings) expected to commission its \$110 million 100,000-t/yr-capacity boric acid plant at Emet in 2003 and its \$8 million Bigadiç II crushing unit in 2004. Other projects in the pipeline included a new concentrator at the Kestelek colemanite plant, which was located 80 kilometers west-southwest of Bursa, and the rehabilitation of the stockpile facilities that were located at Bandırma (Eti Holding A.Ş., 2003§).

Cement.—Soc. Ciments Français added another 700,000-t/yr clinker grinding plant and terminal to its four cement plants and one grinding unit with the acquisition of Marmara Cimento in February 2002 (Ciments Français, 2003§).

Silica Sand.—In 2002, Camiş Madencilik A.Ş. [a subsidiary of Türkiye Şişe ve Cam Fabrikaları A.Ş. (ŞİŞECAM)] opened its quartzite sand preparation facilities in Kurucaşile. Camiş Madencilik mined raw materials for companies of the ŞİŞECAM group. The ongoing renovation and modernization project for float glass line 2 of Trakya Cam Sanayii A.Ş. (a subsidiary of ŞİŞECAM) was expected to be completed in March 2003. At the Paşabahçe Eskişehir glassware factory, a new furnace, which will double production capacity, was expected to augment production by February 2003. ŞİŞECAM was the only flat glass manufacturer in Turkey and a leading European glassware manufacturer with worldwide exports approaching \$500 million per year.

Soda Ash.—Projects underway in 2002 at Sanayii Soda A.Ş. (a subsidiary of ŞİŞECAM) included the increase of production capacity at the Mersin soda ash factory to 800,000 t/yr and improvements to the loading facilities at Mersin Port (G. Sayin, ŞİŞECAM, written commun., September 23, 2003). In October, Eti Soda A.Ş. [a venture of the Park Group (72% equity interest), Eti Holdings (26%), and Türkiye Vakıfbank Bankası T.A.O. (2%)] laid the foundation for the Beypazari trona-processing plant. The plant was expected to begin commercial production of soda ash by 2005 and to be supplied by the underground trona mine at Beypazari, which has been under development since 1998.

Mineral Fuels

In 2002, the number of exploration and appraisal wells drilled in Turkey rebounded to 40 after a 3-year period when only about 30 wells per year were drilled. Most of Turkey's oil exploration and production was in the southeastern region. Natural gas activity was primarily in the Thrace region of western Turkey.

Natural Gas.—In 2002, domestic gas production of about 268 million cubic meters was supplemented by imports of 11,603 million cubic meters from Russia, 4,078 million cubic meters from Algeria, 1,274 million cubic meters from Nigeria, and 670 million cubic meters from Iran.

In December 2001, the initial shipment of Iranian natural gas was delivered to Turkey through the 2,577-kilometer, 1.2-m-diameter gas pipeline that ran from Tabriz, Iran, to Ankara, Turkey. In June 2002, Turkish officials ceased to purchase gas, citing poor gas quality. Gas shipments resumed in November. Intergovernmental negotiations during the interlude reportedly allowed Turkey to escape from the requirement to pay for 3 billion cubic meters per year of natural gas regardless of delivered volumes (the take-or-pay clause) and resulted in a discount on previously negotiated gas prices (Alexander's Gas & Oil Connection, 2002§; Dow Jones Business News, 2002§).

Russian gas, which entered Turkey via the main transmission line from Russia through Bulgaria to Ankara, Turkey, should be supplemented in 2003 by gas piped under the Black Sea in the Blue Stream Pipeline. The Blue Stream Pipeline was completed in October 2002, and commercial gas shipments were expected to begin in 2003. Turkish officials obtained discounts on contracted gas prices and reduced take-or-pay volumes from Russia gas supplies transiting the Blue Stream Pipeline.

Liquefied natural gas from Algeria and Nigeria was landed at the Marmara Ereğlisi import terminal and regasification plant.

Oil.—Domestic crude oil production continued to decline. In 2002, it only satisfied about 9% of national oil consumption. In 2002, production of the Government-owned Türkiye Petrolleri A.O. (TPAO), which was the country's largest oil producer, was down to about 12.3 million barrels (Mbbbl) from 12.8 Mbbbl in 2001 (Turkish Petroleum Corp., 2003§). TPAO accounted for 70% of national production.

Outlook

Turkey's mineral resources were diverse and extensive (Erseçen, 1989). In general, multinational mining companies traditionally have expressed interest in commodities that were minable by large-scale methods, which, in Turkey, would include deposits of bauxite, boron, copper, gold, iron, pumice, salt, silver, and trona. Given the 10% increase of gold at the end of 2002, international interest in gold exploration in Turkey is expected to increase in 2003, despite the uncertainty of the Ovacık situation.

Turkey was renowned for its deposits of industrial minerals (especially barite, boron celestite, clays, limestone and marble, magnesite, perlite, pumice, and trona) and lignite and semibituminous coal; most of the mining operations in Turkey, however, were relatively small scale compared with similar foreign mines. International investment interest in development of small industrial mineral or metal deposits has been limited despite Government encouragement. Discovered gasfields and oilfields also have tended to be small, although there is hope that exploration in the Black Sea could reveal larger petroleum resources. Turkey was expected to remain dependent on imported oil and natural gas.

In the late 1990s, projected national energy demands and a Government-mandate to reduce pollution generated by coal- and lignite-burning electrical power generators had led the Government to sign up for significant new volume of natural gas under take-or-pay contracts from Azerbaijan, Iran, Nigeria, Russia, and Turkmenistan; the 2000-01 economic downturn, however, led the Government to revise the nation's projected energy demand. In July 2002, estimated natural gas demand for 2003 was reduced to 27.3 trillion cubic meters from 31.6 trillion cubic meters. Expected demand in 2005 was reduced to 32.2 trillion cubic meters from the former projection of 44 trillion cubic meters. Contracted gas supply was to ramp up from about 26 trillion cubic meters in 2003 to 48 trillion cubic meters in 2007, when it could exceed demand (Turkish Daily News, 2003§; Boru Hatlari Ile Petrol Taşma A.Ş., undated§).

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TABLE 1
TURKEY: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity	1998	1999	2000	2001 ^e	2002 ^e
METALS					
Aluminum:					
Bauxite ³	458,028	207,743	458,537	242,040 ^{r,4}	287,403 ⁴
Alumina:					
Gross weight	156,825	159,122	155,448	145,993 ^{r,4}	152,869 ⁴
Metal, smelter ^e	62,000	62,000	61,000	61,730 ^{r,4}	63,000
Antimony:^e					
Ore, mine output:					
Gross weight	500	3,400	6,800	7,000	7,000
Sb content	30	180	360	370	370
Concentrates:^e					
Gross weight	100	500	1,000	1,000	1,000
Sb content	20	100	200	200	200
Cadmium	69	64	--	--	--
Chromite, gross weight (34% to 43% chromic oxide) ⁵	1,404,470	770,352	545,725	389,759 ⁴	313,637
Copper:					
Mine output, exclusive of pyrite:⁶					
Gross weight	4,052,175	4,297,170	4,473,711	3,467,306 ^{r,4}	2,942,721 ⁴
Cu content of ore	73,900 ^{r,e}	73,051	76,053	56,864 ^{r,4}	48,253 ⁴
Metal:					
Smelter output, primary and secondary	32,900 ^{r,e}	32,900 ^{r,e}	32,550 ^{r,4}	33,504 ^{r,4}	32,550 ⁴
Refined ^e	91,800	60,500 ^r	64,100 ^r	58,400 ^r	41,000
Gold ^{e,7} kilograms	1,000	1,200	500	2,000	5,000
Iron and steel:					
Iron ore:					
Gross weight thousand metric tons	5,885	4,846	4,076	3,932 ⁴	4,500
Fe content ^e do.	3,200	2,300	2,200 ^r	2,100 ^r	2,400
Metal:					
Pig iron and ferroalloys:					
Ferromanganese	110,175	99,100	97,240	50,735 ⁴	11,200
Ferrosilicon	4,810	420	--	5,895 ^{r,4}	7,245 ⁴
Pig iron	456,465	314,670	300,000 ^e	247,598 ^{r,4}	157,622 ⁴
Steel, crude including castings thousand metric tons	13,351	14,309	14,325	14,382 ^{r,4}	16,046 ⁴
Lead:					
Mine output, Pb and Pb-Zn ores:					
Gross weight	292,065	284,504	345,391	388,795 ^{r,4}	375,592 ⁴
Pb content	13,500 ^e	14,225	17,270	17,923 ^{r,4}	17,352 ⁴
Concentrates:^e					
Gross weight	12,100	11,500	13,000	13,000	13,000
Pb content	7,900	7,500	8,500	8,500	8,500
Metal, refined ^e	8,000	4,000	4,000	4,000	4,000
Manganese ore, gross weight ⁸	53,283	29,000	23,300	20,000 ^{r,4}	20,000 ⁴
Silver, mine output, Ag content ^{e,9} kilograms	110,000	100,000	110,000	987,656 ^{r,4}	662,000 ⁴
Zinc:					
Mine output, Zn and Pb-Zn ore:					
Gross weight	45,795	4,630	861	816	800
Zn content	6,000 ^e	545	39	37	35
Concentrates:^e					
Gross weight	5,000	500	26	25	25
Zn content	3,000	300	26	25	25
Metal, smelter, primary	35,716	33,179	--	--	--

See footnotes at end of table.

TABLE 1--Continued
TURKEY: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity	1998	1999	2000	2001 ^e	2002 ^e	
INDUSTRIAL MINERALS						
Aluminum sulfate, alunite	10,624	11,264	12,266	11,531 ^{r,4}	11,389 ⁴	
Barite, run of mine	160,042	150,058	120,893	57,373 ^{r,4}	106,843 ⁴	
Boron minerals:						
Run of mine	2,754,082	2,554,404	2,398,220	2,357,592 ^{r,4}	2,214,064 ⁴	
Concentrates	1,547,000 ^r	1,504,000 ^r	1,402,000 ^r	1,493,361 ^r	1,346,000 ⁴	
Refined borates	362,000	387,000	435,000	420,000	436,000 ⁴	
Cement, hydraulic	thousand metric tons	38,200	34,258	35,825	30,125 ^r	32,576
Clays:						
Bentonite	565,708	899,614	636,273	674,178 ^{r,4}	559,224 ⁴	
Kaolin	403,733	449,954	595,415	574,550 ^r	372,344 ⁴	
Other ^e	6,000,000	6,000,000	6,500,000	2,506,061 ^{r,4}	2,500,000	
Emery	19,027	14,535	16,830	13,629 ^{r,4}	15,418 ⁴	
Feldspar, run of mine	1,089,483	1,369,655	1,147,716	1,510,293 ^{r,4}	1,766,387 ⁴	
Fluorspar	5,000 ^e	4,812	4,113	4,093 ^r	5,344 ⁴	
Glass, crude	thousand metric tons	1,410 ^e	1,203	1,300 ^e	1,400	1,550
Graphite, run of mine ^e	15,000	15,000	15,000	15,000	15,000	
Gypsum, other than that for cement	351,557	242,960	302,552	328,656 ^{r,4}	264,038 ⁴	
Lime ¹⁰	thousand metric tons	1,066	975	914	855 ^{r,e}	850
Magnesite, run of mine	2,703,343	1,724,744	2,672,089	1,450,031 ^{r,4}	3,044,440 ⁴	
Meerschaum ^c	kilograms	400	400	500	400	300
Nitrogen, N content of ammonia ^e	560,000	82,400	53,400	67,100 ^r	300,500	
Perlite, run of mine	124,312	147,818	149,429	70,738 ^{r,4}	151,902 ⁴	
Pumice	579,000 ¹¹	950,189	787,081	754,052 ^{r,4}	820,347 ⁴	
Pyrites, cupreous, gross weight	699,408	896,519	561,565	662,872 ^{r,4}	952,094 ⁴	
Silica sand, gross weight	thousand metric tons	1,138	1,211	1,485	1,207 ^{r,4}	1,274 ⁴
Sodium compounds:						
Salt, NaCl, all types	do.	2,170	2,146	2,126	1,771 ^{r,4}	2,197 ⁴
Soda ash, trona ^e	do.	560 ^r	620 ^r	620 ^r	640 ^r	600
Sodium sulfate, concentrates	300,000 ^e	438,069	456,590	300,000 ^{r,e}	562,660 ⁴	
Stone:						
Dolomite	829,775	921,105	957,182	915,441 ^{r,4}	975,971 ⁴	
Limestone, other than for cement	thousand metric tons	52,355	28,045	30,295	40,572 ^{r,4}	30,261 ⁴
Marble	cubic meters	633,432	739,240	647,160	460,834 ^{r,4}	557,630 ⁴
Quartzite	2,301,270	2,514,383	2,743,271	2,085,791 ^{r,4}	2,006,654 ⁴	
Strontium minerals, celestite: ^c						
Run of mine	50,000	100,000 ^r	40,000	110,000 ^{r,e}	116,278 ⁴	
Concentrates	30,000	60,540 ^{r,4}	24,150 ^{r,4}	63,635 ^{r,4}	70,000	
Sulfur: ^c						
S content of pyrites	--	45,000 ⁴	26,000 ⁴	30,000	30,000	
Byproduct:						
Petroleum	54,000	47,000	43,000	51,000	50,000	
Other	91,000	75,000	75,000	75,000	75,000	
Total	145,000	167,000	144,000	156,000	155,000	
Talc	5,000 ^e	48,378	54,278	883 ^{r,4}	98 ⁴	
MINERAL FUELS AND RELATED MATERIALS						
Asphalt, natural ^c	157,334 ⁴	150,000	150,000	150,000	118,235 ⁴	
Carbon black	39,971	26,379	35,144	35,000	35,000	
Coal:						
Hard coal, run of mine	thousand metric tons	3,336	2,738	3,330	3,370 ^{r,4}	3,313 ⁴
Lignite, run of mine	do.	66,499	66,706	61,315	58,173 ^{r,4}	49,627 ⁴
Coke and semicoke	do.	2,144	2,811	2,090	1,890 ^{r,4}	2,080 ⁴
Gas:						
Natural, marketed	thousand cubic meters	561,995	718,806	611,822	600,000	268,000
Coal, manufactured ^c	do.	15,000	--	-- ⁴	--	--

See footnotes at end of table.

TABLE 1--Continued
TURKEY: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity	1998	1999	2000	2001 ^e	2002 ^e	
MINERAL FUELS AND RELATED MATERIALS--Continued						
Petroleum:						
Crude	thousand 42-gallon barrels	23,072	21,157	19,783	18,370 ⁴	17,579 ⁴
Refinery products:						
Liquefied petroleum gas	do.	8,774	8,071	7,409	8,019 ^{r,4}	8,580 ⁴
Gasoline	do.	31,673	38,096	39,889	24,993 ^{r,4}	31,634 ⁴
Naphtha	do.	15,917	16,106	15,717	16,656 ^{r,4}	11,947 ⁴
Jet fuel	do.	13,767	11,883	11,009	9,496 ^{r,4}	9,368 ⁴
Kerosene	do.	583	730	638	209 ^{r,4}	312 ⁴
Distillate fuel oil ¹²	do.	59,860	69,551	70,333	58,901 ^{r,4}	59,281 ⁴
Lubricants	do.	4,714	4,501	4,322	1,736 ^{r,4}	2,090 ⁴
Residual fuel oil	do.	44,818	9,512	8,769	56,323 ^{r,4}	53,077 ⁴
Asphalt	do.	10,912	7,635	7,764	6,661 ^{r,4}	7,548 ⁴
Unspecified ¹³	do.	26	1,644	3,110	5,969 ^{r,4}	6,125 ⁴
Total	do.	191,044	167,729	168,960	189,000 ^r	190,000

^eEstimated. ^rRevised. -- Zero.

¹Table includes data available through September 3, 2003. Large quantities of construction materials (clay, sand, and gravel) are quarried. Also mined are basalt, diabase, granite, onyx, sandstone, serpentine, slate, and travertine for building stone, limestone and gypsum for cement manufacture, and molybdenum, olivine, titanium, tungsten, and zeolite; but information is inadequate to estimate output.

²Estimated data are rounded to no more than three significant digits; may not add to totals shown.

³Data are for public sector only. Data for private sector production are not available, but production is believed to be approximately 30,000 metric tons per year.

⁴Reported figure.

⁵Approximately 70% of gross production is salable product. Previously reported estimates of salable product in metric tons: 1998 -- 1,000,000.

⁶Copper mines produce a copper concentrate (of about 22% Cu) and a cupreous pyrite concentrate (about 0.7% Cu). Copper is not recovered from the cupreous pyrite concentrate.

⁷Data includes estimated content of Turkish copper refinery tankhouse slimes. Prior to 2001, all gold production was the byproduct of base metals refining.

⁸Does not include manganiferous iron ore from the Deveci Mine, production of which amounts to several hundred thousand tons per year and has a manganese content of 3% to 5%.

⁹Includes estimated content of base metals refinery tankhouse slimes.

¹⁰Data are lime produced for steel production and do not include the widespread artisanal production of lime for whitewash and sanitation purposes.

¹¹Turkish pumice production was officially reported in cubic meters and has a density reported to range from 0.5 to 1.0 metric ton per cubic meter. Values in this table have been converted by using 1 cubic meter = 0.75 metric ton.

¹²Diesel fuel (gasoil) and special heating oil.

¹³Includes refinery fuel and losses.