TUNGSTEN

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No U.S. tungsten mine production was reported in 2005. U.S. supply of tungsten raw materials comprised imports, tungsten-bearing scrap, releases from industry stocks, and sales of excess materials from the National Defense Stockpile (NDS). China continued to be the world's leading producer of tungsten concentrates and the leading supplier of U.S. imports of tungsten materials. Tight supplies of tungsten concentrates within China resulted in significant increases in the world prices of ammonium paratungstate, ferrotungsten, and tungsten ore concentrates. U.S. apparent consumption was lower than that for 2004, primarily because of a significant increase in U.S. exports. Salient U.S. tungsten statistics and world tungsten concentrate production for 2005 and the previous 4 years are listed in table 1.

Most data in this report have been rounded to three significant digits. Totals and percentages were calculated from unrounded numbers. Unless otherwise specified, all statistics in this report are in metric tons of contained tungsten. Tungsten prices and many tungsten statistics from other sources are quoted in units of tungsten trioxide (WO_3). The short ton unit, which is used in the United States, is 1% of a short ton (20 pounds), and WO_3 is 79.3% tungsten. A short ton unit of WO_3, therefore, equals 20 pounds of WO_3 and contains 7.19 kilograms (kg) (15.86 pounds) of tungsten. The metric ton unit, which is used in most other countries, is 1% of a metric ton (10 kg). A metric ton unit of WO_3, therefore, equals 10 kg of WO_3 and contains 7.93 kg (17.48 pounds) of tungsten.

Tungsten is a whitish-gray metal with many unique properties and a wide variety of commercial, industrial, and military applications. The leading use is as tungsten carbide in cemented carbides, which are wear-resistant materials used by the construction, metalworking, mining, and oil and gas drilling industries. Tungsten alloy and pure tungsten metal contacts, electrodes, and wires are used in electrical, electronic, heating, lighting, and welding applications. Tungsten is also used to make heavy-metal alloys for armaments, heat sinks, radiation shielding, and weights and counterweights; superalloys for turbine blades; tool steels; and wear-resistant alloy parts and coatings. Tungsten alloys and composites are used as a substitute for lead in bullets and shot. Tungsten chemicals are used to make catalysts, corrosion-resistant coatings, dyes and pigments, fire-resistant compounds, lubricants, phosphors, and semiconductors.

Legislation and Government Programs

The Defense National Stockpile Center (DNSC), U.S. Department of Defense, sold tungsten materials from the NDS under two formats—negotiated sales and a strategic supply alliance (SSA). Awards from negotiated sales were made in January and May for ores and concentrates, in March and November for ferrotungsten, and in September for metal powder and fabricated materials. The November award of ferrotungsten depleted the NDS of that material. The DNSC awarded approximately 248 metric tons (t) of tungsten in ores and concentrates as SSA sales during fiscal year 2005 (October 1, 2004, through September 30, 2005); additional ores and concentrates were sold under the SSA format during the quarter ending December 31, 2005 (Defense National Stockpile Center, 2005; U.S. Department of Defense, 2006, p. 61-62).

During fiscal year 2005, 2,520 t of contained tungsten was sold. By the end of the fiscal year, 33 t of tungsten metal powder and 194 t of tungsten contained in ores and concentrates had been sold, but not shipped, from the stockpile (U.S. Department of Defense, 2006, p. 11, 57).

During the calendar year, 2,750 t of tungsten contained in ferrotungsten, tungsten metal powder, and tungsten ores and concentrates was sold. The quantities of tungsten materials remaining in the stockpile at the end of the calendar year, including those committed for sale and pending shipment, are listed in tables 1 and 2.

The Annual Materials Plan for fiscal year 2005, which represented the maximum quantities of tungsten materials that could be sold, is listed in table 2. The quantity for tungsten ores and concentrates available for sale during fiscal year 2006 (October 1, 2005, through September 30, 2006) was increased to 3,630 t (8 million pounds) of contained tungsten; the quantities for tungsten metal powder and ferrotungsten were unchanged from those for fiscal year 2005 (U.S. Department of Defense, 2006, p. 7, 9, 25).

The U.S. Fish and Wildlife Service (FWS) granted final approval for use of an iron-tungsten-nickel shot product for hunting waterfowl and coots. Approval of this product, which contained 62% iron, 25% tungsten, and 13% nickel, brought the number of FWS-approved tungsten-base shot products to nine. The other eight products were tungsten bronze, tungsten-iron containing 40% tungsten, tungsten-iron containing 22% tungsten, tungsten matrix (a tungsten-polymer composite), tungsten-nickel-iron, tungsten polymer, tungsten-tin-bismuth, and tungsten-tin-iron-nickel (U.S. Fish and Wildlife Service, 2005).

The Department of Health and Human Services (HHS) Agency for Toxic Substances and Disease Registry published a final toxicological profile on tungsten. In addition to presenting available information on the health effects of tungsten and tungsten compounds, the profile also identified ongoing research and areas for possible future study (Agency for Toxic Substances and Disease Registry, 2005§[1]).

The U.S. Environmental Protection Agency (EPA) recommended that two tungsten oxide compounds be added to the Toxic Substances Control Act's Preliminary Assessment Information Reporting (PAIR) Program. The oxides are in addition to 20 tungsten compounds that were added in 2003.

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

Tungsten compounds were added to the PAIR program because limited data were available to assess the potential long-term adverse health effects of tungsten exposure. The program requires producers and importers of listed materials to report production, importation, and exposure data to the EPA (U.S. Environmental Protection Agency, 2004, 2005).

Production

Domestic production statistics for tungsten are based on data collected by the U.S. Geological Survey (USGS) by means of two separate voluntary surveys. Statistics that result from these surveys are listed in tables 1 and 3. The annual "Tungsten Ore and Concentrate Survey" covered the production, purchases, disposition, and stocks of tungsten ores and concentrates. No tungsten mine output was reported for the United States in 2005. The monthly "Tungsten Concentrate and Tungsten Products Survey" canvassed companies that produced tungsten carbide powder, tungsten chemicals, and/or tungsten metal powder from ammonium paratungstate, tungsten-bearing scrap, and tungsten concentrate. Major U.S. processors of tungsten materials operating in 2005 included Allegheny Technologies Inc.'s Metalworking Products business, Huntsville, AL; Buffalo Tungsten Inc., Depew, NY; General Electric Co., Euclid, OH; Kennametal Inc., Latrobe, PA, and Fallon, NV; and Osram Sylvania, Inc., Towanda, PA.

In 2005, U.S. processors consumed more ammonium paratungstate and tungsten scrap and less tungsten concentrates than they did in 2004. Domestic production of ammonium paratungstate was higher than that of 2004. Net production of tungsten metal powder and tungsten carbide powder increased by 6% in 2005 compared with that of 2004 (table 3).

Consumption

U.S. apparent consumption of all tungsten materials, as calculated from net imports, primary and secondary production, and changes in Government and industry stock levels, was 11,600 t in 2005, which was 7% lower than the 2004 apparent consumption of 12,600 t. In 2005, total imports, scrap consumption, and NDS shipments were greater than those of 2004. The apparent decrease in consumption was primarily because of higher exports in 2005 than those in 2004.

Statistics on consumption of tungsten in end-use applications by U.S. metal consumers were developed from the voluntary "Consolidated Consumers Survey." For this survey, approximately 65 tungsten consumers were canvassed on a monthly or annual basis. Reported consumption and stock data in tables 1 and 4 include estimates to account for nonrespondents.

Total U.S. reported consumption of tungsten materials to make end-use products in 2005 was slightly lower than that of 2004. Steelmakers and superalloy melters used more tungsten in 2005 than in 2004, producers of other alloys and mill products for lighting and other industries used less, and producers of cemented carbides and chemicals used about the same amount of tungsten in each of the 2 years. Compared with 2004, in 2005, U.S. industry consumed more ferrotungsten and tungsten scrap; less tungsten carbide powder and tungsten metal powder; and approximately the same amount of tungsten chemicals.

Weekly reports of the number of operating drilling rigs give an indication of the demand for tungsten carbide in the form of cemented carbide components used by industry to explore for or to produce oil and natural gas. The number of rigs that operated in the United States continued to trend upward during 2005. The average number of operating rigs in the United States was 1,383, 16% higher than the average 1,192 operating rigs in 2004 (Baker Hughes Inc., undated§).

In 2005, total consumption of tungsten scrap by U.S. processors and consumers was 4,640 t of contained tungsten, which was 16% more than the 4,000 t consumed in 2004.

Prices

During the first half of 2005, inadequate supplies of tungsten concentrates within China, combined with increased demand for tungsten materials in China and elsewhere and a reduction in Chinese export tax rebates, resulted in steep increases in the world prices of tungsten concentrates, ammonium paratungstate, and ferrotungsten. Reasons cited for the tight supply of Chinese concentrates ranged from an actual shortage to market manipulation (Li and Magnowski, 2005). Most prices declined somewhat during the summer months and then increased again beginning in September.

Ammonium paratungstate is the most widely traded primary tungsten material, and as a result, its price has become a reference price for such upstream materials as tungsten ore concentrates and such downstream materials as tungsten metal powder and tungsten carbide powder. Annual average ammonium paratungstate prices in 2005 were more than two and one-half times those of 2004 (table 1). The U.S. ammonium paratungstate price reported by Platts Metals Week began the year at $94 to $98 per short ton unit ($104 to $108 per metric ton unit), more than tripled to $300 to $320 per short ton unit ($331 to $353 per metric ton unit) by mid-May, fell to $190 to $205 per short ton unit ($209 to $226 per metric ton unit) in mid-August, and then rose to end the year at $250 to $260 per short ton unit ($276 to $287 per metric ton unit). U.S. ammonium paratungstate prices reported by Metal Bulletin followed the same trend, with the lowest prices [$94 to $97 per short ton unit ($104 to $107 per metric ton unit)] at the beginning of the year and the highest prices [$290 to $310 per short ton unit ($320 to $342 per metric ton unit)] in mid-May to early June.

Annual average tungsten ore concentrate prices more than doubled (tables 1 and 5). The U.S. spot tungsten ore concentrate price reported by Platts Metals Week, began the year at $55 to $65 per short ton unit ($61 to $72 per metric ton unit), more than tripled to a high of $190 to $210 per short ton unit ($209 to $231 per metric ton unit) in late May to early June, fell to $110 to $120 per short ton unit ($121 to $132 per metric ton unit) by mid-August, and then rose to end the year at $180 to $200 per short ton unit ($198 to $220 per metric ton unit). The Platts' ferrotungsten price was $12.00 to $13.00 per kilogram of contained tungsten in early January, reached a high of $34.40 to $39.20 per kilogram of contained tungsten in mid-October to early November, and ended the year at $32.00 to $34.00 per kilogram of contained tungsten.

Foreign Trade

The total tungsten content of U.S. exports was 5,940 t, 58% higher than the 3,770 t exported in 2004. Exports of all materials, except ferrotungsten and wire, increased compared with those of 2004 (tables 6-10).

The total tungsten content of U.S. imports was 11,200 t, 6% higher than the 10,600 t imported in 2004. China, which continued to be the leading supplier of imported tungsten to the United States, provided 42% of all tungsten imports in 2005. In 2005, the total tungsten content of imports from China increased by 3% to 4,730 t from 4,610 t in 2004. The distribution of materials imported from China was as follows: ammonium paratungstate, 38%; tungsten carbide powder, 18%; tungsten oxide, 14%; tungsten metal powder, 13%; ferrotungsten, 7%; tungsten waste and scrap and unwrought tungsten, 4% each; wrought tungsten, 3%; and tungsten ore, minor amounts. Other significant suppliers of tungsten materials were as follows: Germany, with 11% of the total tungsten imports to the United States; Canada, 10%; Portugal, 7%; and Bolivia and Israel, 5% each.

The tungsten contained in U.S. imports of ores and concentrates was 10% lower than that of 2004, primarily as a result of reduced imports from Canada (table 11). In 2005, the leading suppliers of U.S. imports of tungsten ores and concentrates were Portugal (37%), Bolivia (26%), Canada (13%), Rwanda and Thailand (7% each), and Russia (5%).

U.S. imports of ammonium paratungstate decreased by 8% compared with those of 2004 (table 12). China continued to be the dominant supplier, providing 93% of U.S. ammonium paratungstate imports. Trends in imports of other tungsten materials are presented in tables 13-14.

In 2005, U.S. net import reliance as a percentage of apparent consumption was 68%. Net import reliance as a percentage of apparent consumption is used to measure the adequacy of current domestic production to meet U.S. demand. Net import reliance was defined as imports minus exports plus adjustments for Government and industry stock changes. Releases from stocks, including shipments from the NDS, were counted as part of import reliance, regardless of whether they were imported or produced in the United States. Because there was no recorded U.S. mine production in 2005, about 68% of U.S. tungsten supply was from imports and stock releases, and 32% was from scrap materials generated in the United States.

World Industry Structure

Estimated world tungsten mine production increased in 2005, primarily because of the restart of the Cantung Mine in Canada and an increase in estimated production from China (table 15). In addition to mine production and tungsten recovered from scrap, tungsten materials from stockpiles in Japan and the United States contributed to supply in 2005.

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Australia.—Tasmania Mines Ltd. produced limited quantities of scheelite concentrates as a byproduct of mining magnetite from its Kara open pit mine south of Burnie in Tasmania.

King Island Scheelite Ltd. (formerly named GTN Resources Ltd.) studied the feasibility of redeveloping the King Island Scheelite Mine, which operated between 1917 and 1990 at Grassy, King Island, northwest of Tasmania. The company was considering a three-stage development of the mine over a period of more than 30 years. Initial production would be by open pit mining, followed by expanding and deepening the open pit, and ending with the possible development of an underground mining operation below the pit. King Island Scheelite expected to complete the final bankable feasibility study in 2006, negotiate financing and offtake agreements, and complete the permitting process so that the mine could be developed and production could begin in 2007. Future production was forecast to be 2,400 to 3,100 metric tons per year (t/yr) of tungsten contained in concentrates (King Island Scheelite Ltd., 2005, p. 25, 35-36).

Queensland Ores Ltd. began a feasibility study on its Wolfram Camp tungsten-molybdenum project 90 kilometers (km) west of Cairns in Queensland. The company focused on exploring for tungsten-molybdenum mineralization to support an open pit mine (Queensland Ores Ltd., 2006).

Austria.—Wolfram Bergbau und Hütten GmbH Nfg KG produced tungsten concentrates from the Mittersill scheelite mine in the Province of Salzburg. All these concentrates were converted to primary tungsten products at Wolfram Bergbau's Bergla tungsten processing plant in the Province of Steiermark.

Canada.—North American Tungsten Corp. Ltd. completed arrangements with its creditors and emerged from protection under the Canadian Companies' Creditors Arrangement Act. At midyear, the company began the process of reactivating its Cantung Mine and concentrator in Northwest Territories and, in September, made its first shipment of tungsten concentrates. The company worked to improve operations by increasing underground mine development, introducing new equipment and longhole mining methods, and automating some of the milling operations. North American Tungsten modified its milling circuit to produce a single tungsten concentrate with an average grade of 65% WO_3. This was expected to increase the number of potential customers and bring a higher average sales price than the two grades of concentrates formerly produced (North American Tungsten Corp. Ltd., 2005, p. 2, 5, 8; 2006, p. 5-6).

China.—The China Tungsten Industry Association (CTIA) reported that there were 48 ammonium paratungstate producers with a combined capacity of 131,000 t/yr, 69 tungsten metal powder producers with a combined capacity of 53,600 t/yr, 197 cemented carbide producers with a combined capacity of 28,400 t/yr, and 33 producers of tungsten filaments with a combined capacity of 29.56 billion meters in 2005. CTIA production figures for China were as follows: 90,900 t of tungsten concentrate (WO_3), 51,800 t of ammonium paratungstate, 38,100 t of tungsten oxide, 20,600 t of tungsten metal powder, 15,100 t of cemented carbide, 2,482 t of tungsten bar and rod, and 1,093 t of tungsten filament. In 2005, China recycled 8,019 t of tungsten contained in scrap and imported 6,087 t of tungsten ores and concentrates and 4,600 t of tungsten contained in products, excluding cemented carbides. Domestic demand increased by 11.5% to 22,300 t of contained tungsten. China exported 31,150 t of tungsten contained in products, excluding cemented carbides (Beijing Antaike Information Development Co., Ltd., 2006b, p. 3-4).

In recent years, China's Government has had a program to make full use of its tungsten resources and to try to stabilize world tungsten prices. This program included regulating the production of tungsten concentrates through mine closures and production quotas and regulating tungsten exports by restricting the volumes and types of tungsten materials and products that could be sent out of the country. For 2005, the tungsten concentrate production quota was maintained at 52,000 t (65% WO_3). Two percent of the quota was to be from concentrates recovered from gangue, and the remaining production, by province or autonomous region, was distributed as follows: Jiangxi (58%), Hunan (20%), Guangdong and Yunnan (6% each), Fujian, Guangxi, and Inner Mongolia (2% each), Zhejiang (1%), and Anhui and Qinghai (0.1% each). The 2005 export quota for tungsten materials was set at 16,300 t of contained tungsten. A 13% export tax rebate for ferrotungsten was abolished as of January 1, 2005. Export rebates for other tungsten products were decreased to 8% from 13% as of May 1, 2005, and were to be further reduced to 5% as of January 1, 2006. In addition, to conserve energy, the Government began to take action against the toll production of ferroalloys from imported concentrates, including those of tungsten (Beijing Antaike Information Development Co., Ltd., 2005, p. 13; 2006a, p. 4; China Tungten Industry Association, 2005; Metal Bulletin, 2005; Ryan's Notes, 2005).

India.—Sandvik AB planned to build a new cemented carbide recycling plant adjacent to its existing cobalt recycling plant in Chiplun, south of Mumbai. The new 600-t/yr-capacity plant will process hard cemented carbide scrap collected mainly from Sandvik customers outside of India. All powder produced at the plant will be exported and was expected to replace about one-fourth of the raw materials currently used by the company at plants outside India. The plant was expected to begin operations in mid-2006 (Economic Times, The, 2005§).

Israel.—Metal-Tech Ltd. increased the production capacity of its tungsten processing plant in Ramat Hovav. The plant recycled various types of metal-based wastes to produce tungsten carbide powder, tungsten metal powder, and tungsten oxide (Metal-Tech Ltd., 2006).

Japan.—Japan Oil, Gas and Metals National Corporation (JOGMEC) was the Government agency established to maintain a stable supply of natural resources and energy to Japanese industry. As a result of rising prices, JOGMEC sold 117 t of tungsten concentrates from its rare metals stockpile in June (Japan Oil, Gas and Metals National Corporation, 2006§).

Mongolia.—A joint venture formed between Russian manufacturing and trading company Wolfram Co. (70%) and Mongolian minerals exploration and mining company Kainar Co. Ltd. (30%) began mining the Kyzyl-Tau wolframite deposit in western Mongolia (Wolfram Co., 2006§).

Peru.—In November, Dynacor Mines Inc. acquired Minera Malaga Santolalla S.A.C., which owned the Pasto Bueno tungsten mine approximately 90 km east of the Pacific coast in the Ancash region of Peru. Minera Malaga's assets included two mills for processing ore by gravity methods, two hydroelectric plants and associated water rights, equipment, and a mining camp. The mine began production in 1940, but has had only limited output since the early 1990s. In addition to tungsten, production included copper, lead, silver, and zinc (Dynacor Mines Inc., 2006a; Vector Engineering, Inc., 2006, p. iii, 11).

Portugal.—During the year, Beralt Tin & Wolfram S.A. made improvements to its Panasqueira tungsten mine in east central Portugal. Beralt replaced underground mining equipment with low-profile units, which were expected to increase the mining rate, reduce the quantity of waste rock handled, and improve the grade of ore sent to the processing plant. The company began underground mine development work to access new mining areas and a surface and underground drilling program for mine planning and to investigate potential mineralization elsewhere in the mine. As part of its improvement program, Beralt also planned to add new equipment to the ore processing plant to increase tungsten recovery. In May, Beralt entered into a multiyear contract with Osram for the sale of substantially all of the tungsten concentrate produced from Panasqueira. The contract replaced a previous agreement with Osram that was to expire in April 2006 (Primary Metals Inc., 2006).

Russia.—In recent years, tungsten concentrates have been produced from Primorsky GOK's Vostok-2 Mine and Lermontovskaya Mining Co.'s operation in Primorskiy Kray, from Tyrnyauzsky GOK's operation in the Republic of Kabardino-Balkariya, and from Novoorlovsky GOK in the Aga Buryat Autonomous Okrug. Tyrnyauzsky reportedly nearly ceased production in 2005; Primorsky and Lermontovskaya were also close to shutting down. Novoorlovsky GOK reportedly established a tungsten processing plant in 2005, which was to process ore from the Spokoininskoye tungsten deposit (Interfax International Ltd., 2005a; Interfax Ltd., 2005b).

In the past few years, Russia had increased its capacity to process tungsten-bearing scrap. The country is also a producer of ferrotungsten for domestic use and export (Visser, 2002, p. 7; Schiller, 2004, p. 11).

Spain.—Daytal Resources plc (a joint venture between Cambrian Mining Plc, Tungsten SA Pty. Ltd., and Prehenita S.L) began a feasibility study on the Los Santos tungsten project in the Castilia y Leon region. The Los Santos deposit had a measured and indicated resource of 3.5 million metric tons grading 0.29% WO_3. Daytal was considering open pit mining followed by standard comminution, gravity concentration, and filtration to produce scheelite concentrates beginning in 2008 (Heemskirk Consolidated Ltd., 2006).

Thailand.—SC Mining Co. Ltd. produced high-grade ferberite concentrates from an open pit mine southwest of Chiang Mai in northern Thailand (Black, 2003).

Uzbekistan.—Navoi Mining and Metallurgy Combine and Integra Mining reportedly planned to set up a joint venture to process tailings from the Ingichki tungsten deposit. A feasibility study was initiated on the venture, which was to produce tungsten concentrates for the Uzbek Heat-Resistant and Refractory Metals Plant, as well as for export (Interfax Ltd., 2005c).

Vietnam.—Tiberon Minerals Ltd. of Calgary, Alberta, Canada, completed a final feasibility study on developing the Nui Phao deposit 80 km north-northwest of Hanoi in Thai Nguyen Province. During the year, the Government of Vietnam approved the company's environmental impact assessment and granted a mining license for the project. Tiberon planned to mine the deposit from a single open pit and process the ore by using flotation and gravity methods. The tungsten concentrate was expected to contain an average of 3,718 t/yr of tungsten (4,689 t/yr of WO_3) during a mine life of more than 16 years. Osram agreed to purchase up to 100% of

Nui Phao's annual average production of tungsten concentrates; any tungsten concentrates not purchased by Osram could be sold to the market by Nui Phao Joint Venture Co. Ltd. (a subsidiary of Tiberon). Bismuth cement and copper and fluorspar concentrates would also be produced. Tiberon hoped to begin commercial production in early 2008 (Tiberon Minerals Ltd., 2006, p. 11-13, 21-23).

Outlook

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Demand for tungsten tends to follow general economic conditions. Future consumption of tungsten in cemented carbides, which is the leading end-use sector, will depend on the performance of the following industries: automotive and aircraft production; construction; electronics manufacturing, where cemented carbide microdrills are used on circuit boards; general manufacturing; large equipment manufacturing; mining; and oil and gas drilling. Demand for tungsten is also influenced by changes in government spending for defense applications. In 2002, the consumption of tungsten to produce 5.56-millimeter "green ammunition" for the military was forecast to reach 2,200 to 2,700 t by the year 2006, depending on which ammunition was produced. Since that forecast was made, a significant increase in ammunition requirements and the higher cost of producing the tungsten-base ammunition compared with conventional lead-base ammunition resulted in a restructuring of the green ammunition program to identify a "total cartridge solution" that would lessen environmental impact, perform at least as well or better than the current cartridge, and be cost effective. Future demand for tungsten in green ammunition will depend on the outcome of this research (Payne, 2002, p. 10-11; Metal-Pages, 2005§; U.S. Army Armament Research, Development and Engineering Center, 2005a§, b§).

World tungsten supply will continue to be dominated by Chinese production and exports. Chinese export licenses for 2006 were limited to a total of 15,800 t of all tungsten products, a decrease from the quota of 16,300 t in 2005 (Beijing Antaike Information Development Co., Ltd., 2005, p. 13).

Tungsten prices remained strong during the first half of 2006. As a result of continued high prices and anticipated future growth in demand for tungsten, production from non-Chinese mines was expected to increase. In 2006, Canadian and Portuguese producers planned to increase their output of tungsten concentrates, and Peru's Pasto Bueno Mine began producing concentrates from stockpiled tailings. Production from new (greenfield) mines outside China was not expected before the third quarter of 2007. Numerous additional tungsten mine projects were in the exploration and prefeasibility stages of development (Dynacor Mines Inc., 2006b; King Island Scheelite Ltd., 2006, p. 35).

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TABLE 1
SALIENT TUNGSTEN STATISTICS[1]

(Metric tons of tungsten content and dollars per metric ton unit)

	2001	2002	2003	2004	2005
United States:					
Concentrates:					
Consumption	W	W	W	W	W
Exports	220	94	20	43	52
Imports for consumption	2,680	4,090	4,690	2,310	2,080
Stocks, December 31:					
Consumer	W	W	W	W	W
U.S. Government[2]	31,200 e	30,100	29,400	28,400	26,100
Price:					
U.S. spot quotation[3]	64	55	50	49	146
European[4]	65	38	45	55	123
Ammonium paratungstate:					
Production	W	W	W	W	W
Consumption[5]	9,240	8,860	9,450	8,790	9,530
Stocks, December 31, producer and consumer	W	68	W	W	W

See footnotes at end of table.

TABLE 1—Continued
SALIENT TUNGSTEN STATISTICS[1]

(Metric tons of tungsten content and dollars per metric ton unit)

	2001	2002	2003	2004	2005
United States—Continued:					
Ammonium paratungstate—Continued:					
Price:					
U.S. free market[6]	99	72	69	92	237
U.S. market[3]	97	73	72	91	240
European free market[6]	89	54	62	84	223
Primary products:					
Net production[7]	10,100	12,400	9,420	7,400	7,810
Consumption[8]	9,090	9,490	9,600	11,200	11,000
Stocks, December 31:					
Producer[9]	698	666	793	787	800
Consumer[8]	729	394	423	406	505
U.S. Government[2]	1,120 e	947	765	685	282
World, production of concentrate	50,800 r	66,100 r	68,200 r	69,400 r	70,100 e

eEstimated. rRevised. W Withheld to avoid disclosing company proprietary data.

[1]Data are rounded to no more than three significant digits.

[2]Defense National Stockpile Center. Includes material committed for sale pending shipment.

[3]Annual average calculated from weekly prices reported by Platts Metals Week.

[4]Annual average calculated from semiweekly prices reported by Metal Bulletin.

[5]Reported by tungsten processors.

[6]Annual average calculated from annual average high and low prices reported by Metal Bulletin.

[7]Includes only tungsten metal powder and tungsten carbide powder.

[8]Includes ammonium paratungstate and other tungsten chemicals, ferrotungsten, tungsten metal powder, tungsten carbide powder, and tungsten scrap.

[9]Data exclude cast and crystalline tungsten carbide powder and chemicals.

TABLE 2
U.S. GOVERNMENT NATIONAL DEFENSE STOCKPILE TUNGSTEN STATISTICS IN 2005[1, 2]

(Metric tons of tungsten content)

	Inventory, yearend[3]		Annual	Sales		Inventory decrease[4]	
Material	Fiscal year[5]	Calendar year	Materials Plan[5]	Fiscal year[5]	Calendar year	Fiscal year[5]	Calendar year
Ores and concentrates	26,700	26,100	2,270	2,250	2,350	1,710	2,310
Ferrotungsten	105	--	136	121	254	157	262
Tungsten metal powder	413	282	136	147	147	50	142
Total	27,200	26,300	2,540	2,520	2,750	1,920	2,710

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes stockpile- and nonstockpile-grade materials.

[3]Includes material committed for sale pending shipment.

[4]From previous year.

[5]Twelve-month period ending September 30, 2005.

Source: Defense National Stockpile Center.

TABLE 3
U.S. NET PRODUCTION AND STOCKS OF TUNGSTEN PRODUCTS[1, 2, 3]

(Metric tons of tungsten content)

	Tungsten metal powder	Tungsten carbide powder	Total
Net production:			
2004	3,020	4,370	7,400
2005	3,150	4,660	7,810
Producer stocks:			
December 31, 2004	438	349	787
December 31, 2005	395	405	800

[1]Net production equals receipts plus gross production less quantity used to make other products in table.
[2]Data are rounded to no more than three significant digits; may not add to totals shown.
[3]Data for cast and crystalline tungsten carbide powder and tungsten chemicals are withheld to avoid disclosing company proprietary data; not included in "Total."

TABLE 4
U.S. REPORTED CONSUMPTION AND STOCKS OF TUNGSTEN PRODUCTS[1, 2, 3]

(Metric tons of tungsten content)

	2004	2005
Consumption by end use:		
Steels	259	280
Superalloys	W	W
Other alloys[4]	W	W
Cemented carbides[5]	6,020	6,020
Mill products made from metal powder	W	W
Chemical uses	130	130
Total	11,200	11,000
Consumption by form:		
Ferrotungsten	248	250
Tungsten metal powder	W	W
Tungsten carbide powder	6,120	5,930
Tungsten scrap	W	W
Other tungsten materials[6]	130	130
Total	11,200	11,000
Consumer stocks, December 31:		
Ferrotungsten	21	24
Tungsten metal powder	28	27
Tungsten carbide powder	308	394
Tungsten scrap	19	29
Other tungsten materials[6]	30	30
Total	406	505

W Withheld to avoid disclosing company proprietary data; included in "Total."
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Does not include materials used in making primary tungsten products.
[3]Includes estimates.
[4]Includes welding and hard-facing rods and materials, wear- and corrosion-resistant alloys, and nonferrous alloys.
[5]Includes diamond tool matrices, cemented and sintered carbides, and cast carbide dies or parts.
[6]Includes tungsten chemicals.

TABLE 5
MONTHLY PRICE QUOTATIONS OF TUNGSTEN CONCENTRATES IN 2005

	Metal Bulletin, European market, 65% WO_3 basis, c.i.f.[1, 2]				Platts Metals Week, U.S. spot quotations, 65% WO_3 basis, c.i.f[1]. U.S. ports, including duty[3]			
	Dollars per metric ton unit			Dollars per short ton unit,	Dollars per short ton unit			Dollars per metric ton unit,
Month	Low	High	Average	average	Low	High	Average	average
January	62	66	64	58	55	65	60	66
February	68	80	74	67	65	80	73	80
March	74	95	85	77	75	85	80	88
April	86	95	91	82	80	100	90	99
May	86	160	123	112	90	210	150	165
June	130	160	145	132	180	210	195	215
July	130	160	145	132	140	180	160	176
August	130	160	145	132	110	140	125	138
September	130	160	145	132	110	155	133	146
October	130	160	145	132	145	155	150	165
November	130	160	145	132	160	210	185	204
December	130	160	145	132	160	200	180	198

[1]Cost, insurance, and freight.

[2]Combined wolframite and scheelite quotations. Low and high prices are reported semiweekly. Monthly averages are arithmetic averages of semiweekly low and high prices. The annual average price per metric ton unit of WO_3 of all semiweekly low and high prices was $123 in 2005. The average equivalent price per short ton unit of WO_3 was $111 in 2005.

[3]Low and high prices are reported weekly. Monthly averages are arithmetic averages of weekly low and high prices. The annual average price per short ton unit of WO_3 of all weekly low and high prices was $132 in 2005. The average equivalent price per metric ton unit of WO_3 was $146 in 2005.

TABLE 6
U.S. EXPORTS OF TUNGSTEN ORES AND CONCENTRATES, BY COUNTRY[1]

	2004			2005		
	Quantity			Quantity		
Country of destination	Gross weight (metric tons)	Tungsten content[2] (metric tons)	Value (thousands)	Gross weight (metric tons)	Tungsten content[2] (metric tons)	Value (thousands)
Argentina	(3)	(3)	$5	(3)	(3)	$3
Australia	2	1	32	--	--	--
Bulgaria	--	--	--	(3)	(3)	6
Canada	4	2	28	--	--	--
China	17	9	259	63	33	861
France	(3)	(3)	7	(3)	(3)	4
Germany	19	10	159	--	--	--
Hong Kong	--	--	--	(3)	(3)	6
India	(3)	(3)	7	--	--	--
Ireland	--	--	--	(3)	(3)	17
Italy	1	(3)	13	--	--	--
Japan	(3)	(3)	5	(3)	(3)	12
Korea, Republic of	--	--	--	2	1	24
Malaysia	--	--	--	(3)	(3)	3
Mexico	(3)	(3)	5	--	--	--
Netherlands	2	1	35	28	14	552
Philippines	(3)	(3)	3	--	--	--
Singapore	(3)	(3)	3	--	--	--
South Africa	1	1	9	--	--	--
Sweden	18	9	156	--	--	--
Switzerland	--	--	--	(3)	(3)	6
Taiwan	(3)	(3)	4	--	--	--
United Kingdom	18	9	229	7	4	106
Total	83	43	959	102	52	1,600

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Content estimated from reported gross weight.

[3]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 7
U.S. EXPORTS OF AMMONIUM PARATUNGSTATE, BY COUNTRY[1]

	2004		2005	
Country of destination	Quantity, tungsten content (metric tons)	Value (thousands)	Quantity, tungsten content (metric tons)	Value (thousands)
China	--	--	291	$3,220
France	(2)	$3	--	--
Germany	124	719	461	5,390
India	--	--	4	33
Mexico	--	--	4	35
Spain	--	--	15	132
Total	125	722	774	8,810

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 8

U.S. EXPORTS OF TUNGSTEN METAL POWDERS, BY COUNTRY[1, 2]

	2004			2005		
	Quantity			Quantity		
Country of destination	Gross weight (metric tons)	Tungsten content[3] (metric tons)	Value (thousands)	Gross weight (metric tons)	Tungsten content[3] (metric tons)	Value (thousands)
Australia	23	19	$643	10	8	$330
Austria	--	--	--	5	4	103
Brazil	11	9	647	13	11	618
Canada	65	52	1,880	92	74	3,280
Chile	1	1	37	2	2	105
China	19	15	804	32	26	1,430
Czech Republic	4	3	47	50	40	766
France	16	13	871	22	18	1,340
Germany	169	135	4,670	319	255	8,810
Hong Kong	3	2	308	1	1	20
India	2	2	53	4	3	199
Israel	20	16	218	41	33	590
Italy	31	25	1,770	39	31	1,970
Japan	17	13	832	28	22	1,180
Korea, Republic of	12	9	328	2	2	159
Martinique	--	--	--	4	4	115
Mexico	6	5	111	19	15	216
Netherlands	1	1	53	3	3	98
Norway	4	3	104	(4)	(4)	6
Serbia and Montenegro	--	--	--	5	4	85
Singapore	6	5	333	20	16	908
South Africa	1	1	61	2	2	112
Spain	3	3	163	11	9	245
Sweden	13	10	251	(4)	(4)	18
Switzerland	13	10	658	8	6	264
Taiwan	45	36	1,460	54	43	1,830
Thailand	2	2	87	2	2	103
Turkey	2	2	115	4	3	247
United Kingdom	40	32	1,840	77	62	2,130
Venezuela	8	7	181	61	49	1,030
Other	4 r	3 r	150 r	4	3	229
Total	542	433	18,700	937	750	28,500

rRevised. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]May include tungsten alloy powders.

[3]Content estimated from reported gross weight.

[4]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 9
U.S. EXPORTS OF TUNGSTEN CARBIDE POWDER, BY COUNTRY[1]

	2004		2005	
Country of destination	Quantity, tungsten content (metric tons)	Value (thousands)	Quantity, tungsten content (metric tons)	Value (thousands)
Australia	12	$274	19	$596
Austria	7	203	1	13
Belgium	12	243	3	173
Brazil	4	108	5	137
Canada	102	2,550	101	3,620
China	10	173	2	183
France	152	2,320	134	3,180
Germany	224	3,120	308	5,090
Iceland	--	--	7	236
India	19	309	20	586
Ireland	9	457	12	721
Israel	(2)	9	7	126
Italy	6	138	3	171
Japan	20	574	14	484
Korea, Republic of	23	578	6	360
Luxembourg	35	552	2	63
Malaysia	(2)	7	3	97
Mexico	4	91	3	219
Norway	2	90	4	307
Russia	--	--	3	38
Singapore	4	221	4	266
South Africa	30	472	120	3,330
Spain	5	61	6	211
Sweden	167	2,040	252	4,520
Switzerland	3	106	7	248
Taiwan	7	285	17	412
United Kingdom	568	8,790 r	480	11,800
Venezuela	--	--	3	50
Other	10 r	372 r	10	597
Total	1,440	24,200	1,560	37,800

rRevised. -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 10

U.S. EXPORTS OF MISCELLANEOUS TUNGSTEN-BEARING MATERIALS, BY COUNTRY[1]

Product and country of destination	2004 Quantity, tungsten content (metric tons)	2004 Value (thousands)	2005 Quantity, tungsten content (metric tons)	2005 Value (thousands)
Ferrotungsten and ferrosilicon tungsten:				
Canada	1	$17	4	$108
Chile	(2)	6	--	--
Mexico	98	238	25	88
Total	99	261	29	196
Unwrought tungsten:[3, 4, 5]				
Australia	1	4	19	79
Brazil	20	101	8	49
Canada	14	280	54	517
Chile	--	--	3	12
China	6	27	7	28
Denmark	--	--	10	48
France	23	98	(2)	3
Germany	78	332	130	546
Hungary	69	328	16	84
Ireland	--	--	2	9
Israel	2	10	2	8
Italy	34	143	4	17
Japan	7	30	51	215
Korea, Republic of	1	3	28	136
Malaysia	15	68	30	141
Mexico	127	637	28	146
Netherlands	19	164	12	52
Peru	--	--	3	13
Philippines	--	--	8	32
Singapore	3	13	13	54
Sweden	5	43	25	103
Switzerland	11	99	1	35
Taiwan	262	1,170	340	1,630
Turkey	16	67	--	--
United Kingdom	37	189	129	656
Yemen	--	--	41	174
Other	1 r	3 r	3	15
Total	754	3,810	966	4,800
Waste and scrap:[4]				
Armenia	7	40	13	48
Australia	--	--	(2)	4
Austria	--	--	148	916
Belgium	74	452	20	351
Brazil	3	24	7	100
Canada	22	174	56	411
China	60	463	5	26
Germany	119	911	145	1,780
India	110	616	3	9
Japan	13	136	277	4,380
Korea, Republic of	--	--	3	16
Mexico	2	11	6	37
Netherlands	43	223	45	260
Singapore	2	11	4	21
Sweden	11	132	2	10

See footnotes at end of table.

TABLE 10—Continued

U.S. EXPORTS OF MISCELLANEOUS TUNGSTEN-BEARING MATERIALS, BY COUNTRY[1]

Product and country of destination	2004 Quantity, tungsten content (metric tons)	2004 Value (thousands)	2005 Quantity, tungsten content (metric tons)	2005 Value (thousands)
Waste and scrap—Continued:[4]				
Taiwan	7	$39	(2)	$4
United Arab Emirates	3	48	--	--
United Kingdom	50	390	124	1,050
Total	525	3,670	858	9,420
Wrought tungsten:[3, 4, 6]				
Brazil	3	675	11	1,370
Canada	44	2,590	35	2,440
China	5	1,050	4	1,090
Colombia	6	2,090	7	2,470
Czech Republic	10	977	18	2,780
France	6	1,210	4	1,070
Germany	36	3,390	82	5,400
Hong Kong	2	319	(2)	45
Hungary	8	1,130	6	1,380
India	13	642	8	444
Israel	3	276	4	797
Italy	4	390	3	674
Japan	97	7,720	119	13,200
Korea, Republic of	5	1,460	2	829
Mexico	36	5,590	33	4,180
Netherlands	(2)	100	2	571
Philippines	3	157	4	275
Singapore	2	260	2	355
Slovakia	2	362	1	217
Spain	19	895	18	808
Sweden	2	238	2	278
Taiwan	2	585	3	595
United Arab Emirates	2	188	1	98
United Kingdom	17	1,530	26	1,930
Other	8	2,050 r	10	2,600
Total	334	35,900	404	46,500
Tungsten compounds:[7]				
Canada	7	17	454	1,330
China	--	--	39	264
France	1	23	(2)	12
Mexico	12	74	--	--
Netherlands	--	--	20	456
United Kingdom	--	--	38	410
Other	(2)	8	1	54
Total	20	122	553	2,530

[r]Revised. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Less than ½ unit.

[3]May include alloys.

[4]Content estimated from reported gross weight.

[5]Includes bars and rods produced simply by sintering; excludes powders and waste and scrap.

[6]Includes bars and rods other than those produced simply by sintering; profiles, plates, sheets, strip, and foil; wire; and other wrought products.

[7]Includes only other tungstates.

Source: U.S. Census Bureau.

TABLE 11
U.S. IMPORTS FOR CONSUMPTION OF TUNGSTEN ORES AND CONCENTRATES, BY COUNTRY[1]

	2004		2005	
Country of origin	Quantity, tungsten content (metric tons)	Value (thousands)	Quantity, tungsten content (metric tons)	Value (thousands)
Bolivia	504	$3,620	547	$10,200
Canada	778	3,710	270	1,300
China	(2)	21	1	2
Congo (Kinshasa)	28	97	57	500
Hong Kong	--	--	(2)	5
Kenya	38	177	--	--
Mexico	3	10	30	221
Mongolia	30	85	13	76
Portugal	514	4,710	764	16,200
Russia	--	--	97	593
Rwanda	138	657	140	871
Thailand	228	1,230	146	1,430
Uganda	8	50	--	--
United Kingdom	23	180	--	--
Vietnam	19	71	19	74
Total	2,310	14,600	2,080	31,400

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 12
U.S. IMPORTS FOR CONSUMPTION OF AMMONIUM PARATUNGSTATE, BY COUNTRY[1]

	2004		2005	
Country of origin	Quantity, tungsten content (metric tons)	Value (thousands)	Quantity, tungsten content (metric tons)	Value (thousands)
China	1,830	$14,000	1,790	$28,600
Germany	198	2,010	69	811
Hong Kong	48	368	60	494
Japan	15	156	--	--
Total	2,090	16,500	1,920	29,900

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 13
U.S. IMPORTS FOR CONSUMPTION OF FERROTUNGSTEN AND FERROSILICON TUNGSTEN, BY COUNTRY[1]

	2004		2005	
Country of origin	Quantity, tungsten content (metric tons)	Value (thousands)	Quantity, tungsten content (metric tons)	Value (thousands)
Brazil	43	$412	42	$474
China	349	3,100	342	4,920
Total	392	3,510	385	5,390

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 14

U.S. IMPORTS FOR CONSUMPTION OF MISCELLANEOUS TUNGSTEN-BEARING MATERIALS, BY COUNTRY[1]

Product and country of origin	2004		2005	
	Quantity, tungsten content (metric tons)	Value (thousands)	Quantity, tungsten content (metric tons)	Value (thousands)
Tungsten metal powders:[2]				
Austria	18	$314	8	$161
Belgium	4	96	10	206
Canada	97	1,520	100	3,140
China	714	8,370	614	12,600
Germany	392	6,590	405	12,400
Iceland	--	--	8	16
Israel	81	1,450	237	7,370
Japan	25	1,620	16	1,280
Korea, Republic of	131	2,320	135	4,310
Mexico	25	156	--	--
Other	(3) r	7 r	1	90
Total	1,490	22,400	1,530	41,500
Tungsten carbide powder:				
Canada	520	8,680	486	14,700
China	759	9,660	829	19,000
Czech Republic	6	176	9	636
France	8	695	7	454
Germany	51	976	20	846
Hong Kong	28	341	40	376
India	(3)	3	7	63
Israel	322	4,840	282	6,730
Italy	33	27	--	--
Japan	1	98	1	144
Korea, Republic of	24	377	6	168
Other	1	80 r	(3)	55
Total	1,750	26,000	1,690	43,200
Unwrought tungsten:[2, 4, 5]				
Austria	2	32	--	--
China	150	1,320	182	2,820
Germany	2	89	(3)	14
Russia	--	--	34	537
Singapore	12	193	26	276
Other	2	158	1	131
Total	166	1,790	243	3,780
Waste and scrap:				
Belgium	17	394	6	102
Canada	63	357	265	1,330
China	126	1,260	174	2,670
France	2	14	54	679
Germany	489	3,440	682	8,580
Hong Kong	121	946	62	948
India	16	111	82	762
Israel	17	154	8	47
Japan	160	1,070	235	3,250
Korea, Republic of	23	52	45	336
Mexico	8	88	57	488
Netherlands	--	--	109	1,000
Russia	19	112	--	--

See footnotes at end of table.

TABLE 14—Continued

U.S. IMPORTS FOR CONSUMPTION OF MISCELLANEOUS TUNGSTEN-BEARING MATERIALS, BY COUNTRY[1]

Product and country of origin	2004 Quantity, tungsten content (metric tons)	2004 Value (thousands)	2005 Quantity, tungsten content (metric tons)	2005 Value (thousands)
Waste and scrap—Continued:				
South Africa	18	$121	48	$482
Sweden	11	89	39	261
Switzerland	16	111	16	369
United Arab Emirates	--	--	142	2,180
United Kingdom	43	394	23	418
Other	5 r	21 r	18	178
Total	1,150	8,730	2,070	24,100
Wrought tungsten:[2, 4, 6]				
Austria	28	3,220	25	4,070
Belgium	2	268	11	581
China	117	5,380	123	7,200
Czech Republic	5	1,150	1	337
France	(3)	116	9	997
Germany	25	2,770	20	2,730
Hong Kong	7	508	7	633
Hungary	6	527	5	643
India	4	456	7	465
Israel	3	300	28	1,590
Japan	47	5,160	41	5,220
Mexico	3	22	(3)	32
Russia	4	283	9	869
South Africa	--	--	8	118
Taiwan	11	148	(3)	64
United Kingdom	4	652	5	296
Other	4 r	776 r	6	1,540
Total	270	21,700	306	27,400
Tungsten oxides:				
China	558	6,880	680	17,300
Germany	7	136	3	119
Hong Kong	14	151	(3)	15
Liechtenstein	41	701	--	--
Netherlands	50	360	--	--
Russia	193	1,740	233	5,500
United Kingdom	41	749	(3)	3
Other	--	--	1	18
Total	905	10,700	917	23,000
Other tungstates:				
Australia	(3)	4	(3)	11
China	(3)	4	--	--
Germany	5	89	(3)	33
India	(3)	11	(3)	12
Japan	(3)	9	(3)	7
United Kingdom	(3)	26	2	50
Total	6	142	3	113
Other tungsten compounds:[7]				
Germany	1	226	(3)	114
Japan	4	656	4	681
Ukraine	--	--	(3)	7
United Kingdom	(3)	3	--	--
Total	4	885	4	802

See footnotes at end of table.

TABLE 14—Continued

U.S. IMPORTS FOR CONSUMPTION OF MISCELLANEOUS TUNGSTEN-BEARING MATERIALS, BY COUNTRY[1]

[r]Revised. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]May include alloys.

[3]Less than ½ unit.

[4]Content estimated from reported gross weight.

[5]Includes bars and rods produced simply by sintering; excludes powders and waste and scrap.

[6]Includes bars and rods other than those produced simply by sintering; profiles, plates, sheets, strip, and foil; wire; and other wrought products.

[7]Includes tungsten chlorides.

Source: U.S. Census Bureau.

Collected By Chinatungsten Online

TABLE 15

TUNGSTEN: WORLD CONCENTRATE PRODUCTION, BY COUNTRY[1, 2]

(Metric tons, tungsten content)

Country[3]	2001	2002	2003	2004	2005[e]
Australia	15	7	2	2	2
Austria	1,429 [r]	1,377 [r]	1,381 [r]	1,335 [r]	1,350
Bolivia	532	399	441	401 [r]	522 [4]
Brazil	22	24	30 [r]	262 [r]	250
Burma[5]	85 [r]	83	93	106 [r]	100
Burundi	--	--	13 [r]	9 [r]	10
Canada[6]	--	2,295	3,636	--	700 [4]
China[e]	42,100	55,100	55,500	60,000 [r]	61,000
Korea, North[e]	500	600	600	600	600
Mongolia	63	35	40 [e]	77 [r]	78 [4]
Portugal	698	693	715	746	815 [4]
Russia[e]	5,100 [r]	5,300 [r]	5,450 [r]	5,500 [r]	4,400
Rwanda	142	153	78	120 [e]	120
Thailand[e]	50	31	208	180 [r]	150
Uganda	17	16	1	52 [r]	--
Total	50,800 [r]	66,100 [r]	68,200 [r]	69,400 [r]	70,100

[e]Estimated. [r]Revised. -- Zero.

[1]World totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Table includes data available through May 25, 2006.

[3]Tungsten concentrates are believed to be produced in Nigeria, Peru, and Turkey and may be produced from tin-tungsten ores in Kyrgyzstan, but information is inadequate to make reliable estimates of production.

[4]Reported figure.

[5]Includes tungsten content of tin-tungsten concentrate produced by state-owned mining enterprises under the Ministry of Mines.

[6]Tungsten content of concentrates shipped.