

**STATE OF NEW MEXICO
BEFORE THE WATER QUALITY CONTROL COMMISSION**

_____)
In the Matter of:)
)
)
PROPOSED AMENDMENT)
TO 20.6.2 NMAC (Copper Rule))
)
_____)

No. WQCC 12-01(R)

EXHIBIT BRACK – 7

COPPER

(Data in thousand metric tons of copper content unless otherwise noted)

Domestic Production and Use: U.S. mine production of copper in 2012 increased by 4% to about 1.15 million tons, and was valued at about \$9 billion. Arizona, Utah, New Mexico, Nevada, and Montana—in descending order of production—accounted for more than 99% of domestic mine production; copper also was recovered in Alaska, Idaho, and Missouri. Twenty-eight mines recovered copper, 18 of which accounted for about 99% of production. Three primary smelters, 3 electrolytic and 4 fire refineries, and 15 electrowinning facilities operated during 2012. Refined copper and scrap were used at about 30 brass mills, 15 rod mills, and 500 foundries and miscellaneous consumers. Copper and copper alloys products were used in building construction, 45%; electric and electronic products, 23%; transportation equipment, 12%; consumer and general products, 12%; and industrial machinery and equipment, 8%.¹

Salient Statistics—United States:	2008	2009	2010	2011	2012^o
Production:					
Mine	1,310	1,180	1,110	1,110	1,150
Refinery:					
Primary	1,220	1,110	1,060	993	975
Secondary	54	46	38	37	60
Copper from all old scrap	156	138	143	153	170
Imports for consumption:					
Ores and concentrates	1	(²)	1	15	9
Refined	724	664	605	670	600
General imports, refined	721	645	583	649	600
Exports:					
Ores and concentrates	301	151	137	252	290
Refined	37	81	78	40	180
Consumption:					
Reported, refined	2,020	1,650	1,760	1,760	1780
Apparent, unmanufactured ³	1,990	1,580	1,740	1,730	1770
Price, average, cents per pound:					
Domestic producer, cathode	319.2	241.2	348.3	405.9	370
London Metal Exchange, high-grade	315.5	233.6	341.7	399.8	363
Stocks, yearend, refined, held by U.S. producers, consumers, and metal exchanges	199	434	384	409	200
Employment, mine and mill, thousands	11.9	8.3	9.5	10.6	11.1
Net import reliance⁴ as a percentage of apparent consumption	31	21	32	34	35

Recycling: Old scrap, converted to refined metal and alloys, provided 170,000 tons of copper, equivalent to 10% of apparent consumption. Purchased new scrap, derived from fabricating operations, yielded 650,000 tons of contained copper. Of the total copper recovered from scrap (including aluminum- and nickel-based scrap), brass mills recovered 71%; miscellaneous manufacturers, foundries, and chemical plants, 15%; ingot makers, 9%; and copper smelters and refiners, 5%. Copper in all old and new, refined or remelted scrap contributed about 33% of the U.S. copper supply.

Import Sources (2008–11): Unmanufactured: Chile, 43%; Canada, 32%; Peru, 12%; Mexico, 9%; and other, 4%. Refined copper accounted for 84% of unwrought copper imports.

Tariff: Item	Number	Normal Trade Relations⁵ 12–31–12
Copper ores and concentrates	2603.00.0000	1.7¢/kg on lead content.
Unrefined copper anode	7402.00.0000	Free.
Refined and alloys; unwrought	7403.00.0000	1.0% ad val.
Copper wire (rod)	7408.11.6000	3.0% ad val.

Depletion Allowance: 15% (Domestic), 14% (Foreign).

Government Stockpile: None.

Events, Trends, and Issues: Although refined copper prices remained volatile during the first 10 months of 2012, they traded within a narrower range than in recent years. The COMEX spot copper price began 2012 at \$3.53 per pound of copper, rose to \$3.92 per pound in April, and declined to a low of \$3.28 per pound in June before trending back to \$3.85 per pound in September. The copper supply and demand balance remained tight, in part owing to an

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80% year-on-year increase in China's net imports in the first half of 2012, well in excess of industrial demand. U.S. exports of refined copper through June were nearly four times those for all of 2011, and domestic stocks declined to about one-half those at yearend 2011. The International Copper Study Group (ICSG)⁶ projected that global refined copper demand in 2012 would exceed production by about 400,000 tons, the third consecutive year of production deficit. Global consumption and production of copper were projected to increase by 1.5% and 2.6%, respectively.

U.S. mine production rose by about 4% in 2011, as increases in Arizona, New Mexico, and Nevada, were partially offset by lower production in Utah. Although total refined production remained unchanged, electrolytic refinery production declined by 9% owing to maintenance shutdowns at the three integrated domestic smelters. In June, a new integrated fire refinery and wire-rod mill were commissioned that were expected to increase domestic production of and consumption of fire-refined copper. In 2013, domestic mine and refined production of copper were expected to increase by more than 10%, and according to ICSG projections, global refined copper output was expected to exceed demand owing to more modest demand growth in China and a 6% growth in global refined production.

World Mine Production and Reserves: The reserve estimate for Peru was revised downward to reflect official reported numbers.

	Mine production		Reserves ⁷
	2011	2012 ^o	
United States	1,110	1,150	39,000
Australia	958	970	⁸ 86,000
Canada	566	530	10,000
Chile	5,260	5,370	190,000
China	1,310	1,500	30,000
Congo (Kinshasa)	520	580	20,000
Indonesia	543	430	28,000
Kazakhstan	417	420	7,000
Mexico	443	500	38,000
Peru	1,240	1,240	76,000
Poland	427	430	26,000
Russia	713	720	30,000
Zambia	668	675	20,000
Other countries	<u>1,970</u>	<u>2,100</u>	<u>80,000</u>
World total (rounded)	16,100	17,000	680,000

World Resources: A 1998 USGS assessment estimated 550 million tons of copper contained in identified and undiscovered resources in the United States.⁹ Subsequent USGS reports estimated 1.3 billion tons and 196 million tons of copper in the Andes Mountains of South America and in Mexico, respectively, contained in identified, mined, and undiscovered resources.^{10, 11} A preliminary assessment indicates that global land-based resources exceed 3 billion tons. Deep-sea nodules and submarine massive sulfides are unconventional copper resources.

Substitutes: Aluminum substitutes for copper in power cable, electrical equipment, automobile radiators, and cooling and refrigeration tube; titanium and steel are used in heat exchangers; optical fiber substitutes for copper in telecommunications applications; and plastics substitute for copper in water pipe, drain pipe, and plumbing fixtures.

^oEstimated.

¹Some electrical components are included in each end use. Distribution for 2010 by the Copper Development Association, Inc., 2011.

²Less than ½ unit.

³Defined as primary refined production + copper from old scrap converted to refined metal and alloys + refined imports – refined exports ± changes in refined stocks. General imports were used to calculate apparent consumption.

⁴Defined as imports – exports + adjustments for Government and industry stock changes for refined copper.

⁵No tariff for Canada, Chile, Mexico, and Peru for items shown. Tariffs for other countries may be eliminated under special trade agreements.

⁶International Copper Study Group, 2012, Forecast 2012–2013: Lisbon, Portugal. International Copper Study Group press release, October 10, 1 p.

⁷See Appendix C for resource/reserve definitions and information concerning data sources.

⁸For Australia, Joint Ore Reserves Committee (JORC)-compliant reserves were about 25 million tons.

⁹U.S. Geological Survey National Mineral Resource Assessment Team, 2000, 1998 assessment of undiscovered deposits of gold, silver, copper, lead, and zinc in the United States: U.S. Geological Survey Circular 1178, 21 p.

¹⁰Cunningham, C.G., and others, 2008, Quantitative mineral resource assessment of copper, molybdenum, gold, and silver in undiscovered porphyry copper deposits in the Andes Mountains of South America: U.S. Geological Survey Open-File Report 2008–1253, 282 p.

¹¹Hammarstrom, J.M., and others, 2010, Global mineral resource assessment—Porphyry copper assessment of Mexico: U.S. Geological Survey Scientific Investigations Report 2010–5090–A, 176 p.