

THE MINERAL INDUSTRY OF SOUTH DAKOTA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the South Dakota Geological Survey for collecting information on all nonfuel minerals.

South Dakota ranked 36th in the Nation in nonfuel mineral value¹ in 1994, down from 31st in 1993, according to the U.S. Bureau of Mines (USBM). This was the State's lowest ranking in more than 15 years, during which time the average rank was 33d. The estimated value for 1994 was \$322 million, a 5% decrease from that of 1993. This followed a more than 12% increase in 1993 compared with that of 1992. The State accounted for almost 1% of the U.S. total mineral value. In terms of value, gold remained the leading commodity, followed by portland cement, construction sand and gravel, crushed stone, and dimension stone. Gold and silver accounted for almost 62% of the total nonfuel mineral value. Iron ore was mined for use in a South Dakota cement plant as an ingredient in its cement manufacturing process and not for the production of the metal. The State's fluctuating nonfuel mineral values during the past 2 years mainly reflect similar changes in gold. In 1994, the decreased value of gold was partly offset by increases in the values of portland cement, construction sand and gravel, and crushed stone. Compared with 1993, the value of the following increased: portland cement, construction sand and gravel, crushed stone, crushed sandstone, lime, iron ore, and gypsum. Decreases occurred in gold, dimension stone, silver,

feldspar, masonry cement, and gemstones.

Compared with USBM estimates of the quantities of mineral produced in the other 49 States during 1994, South Dakota remained 4th of the 13 U.S. gold-producing States; 4th of 5 States in which mica was produced; 5th in iron ore; and 7th in feldspar. The State moved up in rank from 11th to 10th in the production of dimension stone. Significant amounts of portland cement and construction sand and gravel also were produced in the State.

According to the South Dakota Geological Survey, gold dominated the State's mining news in 1994. Seven exploration permits were issued to Energy Fuels Corp., Wharf Resources, and Homestake Mining Co. Production continued at gold mines in the Black Hills operated by Homestake, Wharf Resources, Golden Reward Mining Co., Brohm Mining Corp., and Richmond Hill, Inc. In February, plans were adopted to mitigate the degree of acid-generation identified in 1992 from sulfide rock at the Lac Minerals Ltd.'s Richmond Hill Mine. Approximately 3.2 million metric tons (3.5 million short tons) of waste rock, two-thirds of which was reactive (significantly acid-producing), were removed from Richmond Hill's waste depository. The pit was backfilled and capped with a multimaterial cover. An increase in reclamation surety

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN SOUTH DAKOTA¹

Mineral	1992		1993		1994 ^p	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Gemstones	NA	\$967	NA	\$163	NA	W
Gold ² kilograms	18,681	207,195	19,241	223,267	³ 17,000	³ \$197,000
Sand and gravel (construction) thousand metric tons	7,511	22,187	⁴ 8,300	⁴ 25,000	9,500	29,900
Silver ² metric tons	6	802	5	651	4	553
Stone (crushed) thousand metric tons	⁴ 4,082	⁴ 18,900	⁴ 4,227	⁴ 18,684	⁴ 4,400	⁴ 20,000
Combined value of cement, clays (common), feldspar, gypsum (crude), iron ore (usable), lime, mica (scrap), stone [crushed sandstone and miscellaneous (1993-94), dimension], and value indicated by symbol W	XX	50,619	XX	69,391	XX	73,700
Total	XX	300,670	XX	337,156	XX	⁵ 322,000

¹Estimated. ^pPreliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data.

XX Not applicable.

²Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

³Recoverable content of ores, etc.

⁴Placer canvassing discontinued beginning 1994.

⁵Excludes certain stones; kind and value included with "Combined value" data.

⁶Data do not add to total shown because of independent rounding.

bonding from \$1.1 million to \$10.7 million was required by the State Department of Environment and Natural Resources (DENR). During the excavation of limestone for use in the mine reclamation work, a fossil assemblage of Pleistocene mammals and amphibians was unearthed. Geologists from the academic community and the State reported the discovery to be one of the most significant of its nature in the Black Hills. In July, Brohm Mining submitted to the State an acid mine drainage mitigation plan for the Gilt Edge Mine, but the company had not received a permit by yearend. Brohm also submitted plans with the USDA Forest Service and the State to expand its Anchor Hill operation. Energy Fuels continued its exploration in the Keystone district of the southern Black Hills and reported additional potential for an underground gold mine.

DENR's Office of Minerals and Mining remained involved with the Committee to Develop On-Site Innovative Technologies (DOIT) and other national partnerships to solve mine waste problems. The DOIT committee was composed of the Secretaries of the Departments of Energy, Defense, the Interior, and the U.S. Environmental Protection Agency, together with four western Governors serving rotating terms. Based on a memorandum of understanding between all members, the committee was responsible for addressing a number of environmental restoration and waste management problems at Federal facilities and on Federal lands in the West. DENR personnel participated on two of four principal

committees, one of these being the Abandoned Mine Waste Working Group.

DENR's Division of Geological Survey, focusing on manganese, continued research on the mineral potential of the irregular rock contact zone where the State's Mesozoic black shales and basement rock interconnect; the resource assessments were conducted with support from the U.S. Geological Survey's Office of Mineral Resources. Also focusing on manganese, BHP Minerals International Exploration, Inc. targeted its exploration efforts on potential stratiform multicommodity black shales flanking the Proterozoic Sioux Ridge. The Company, however, later requested a release from all six of its eastern South Dakota permits for the exploration for "all minerals, excluding oil, gas, and uranium." American Colloid Co. was developing a plan to open a large-scale bentonite mine in the northern Black Hills and applied for mining permits at yearend. The banning of mineral exploration and mining on about 375 square kilometers (150 square miles) of "unique and scenic" land within Lawrence County was the subject of a ballot issue. The initiative was defeated by a margin of 58% to 42%. The South Dakota Mining Association had strongly opposed the measure.

¹The term value, throughout this document, refers to the monetary value of nonfuel minerals as represented by either mine shipments, mineral commodity sales, or marketable production as is applicable to the individual mineral commodities.

TABLE 2
SOUTH DAKOTA:¹ CRUSHED STONE² SOLD OR USED BY PRODUCERS IN 1993, BY USE

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate: Other construction materials ³	963	\$4,585	\$4.76
Other miscellaneous uses: Other specified uses not listed	1,219	2,971	2.44
Unspecified: ⁵			
Actual	1,326	8,073	6.09
Estimated	720	3,056	4.24
Total ⁶	4,227	18,684	4.42
Total ^{7 8}	4,659	18,684	4.01

¹To avoid disclosing company proprietary data; "District tables were not produced for 1993."

²Includes granite, limestone, and quartzite; excludes miscellaneous stone and sandstone.

³Includes riprap and jetty stone, filter stone, concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, stone sand (concrete), stone sand (bituminous mix or seal), and screening (undesignated).

⁴Includes cement manufacture, lime manufacture, and other fillers or extenders.

⁵Includes production reported without a breakdown by use and estimates for nonrespondents.

⁶Data may not add to totals shown because of independent rounding.

⁷One short ton is equal to 907 kilograms or 2,000 pounds. To convert metric tons to short tons, divide metric tons by 0.907185.

⁸Total shown in thousand short tons and thousand dollars.

TABLE 3
SOUTH DAKOTA: CRUSHED STONE SOLD OR USED, BY KIND

Kind	1991				1993			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	5	2,376	\$7,667	\$3.23	5	2,580	\$9,017	\$3.49
Granite	1	W	W	5.33	—	—	—	—
Sandstone	1	W	W	6.67	1	(1)	(1)	(1)
Quartzite	3	1,180	6,525	5.53	4	1,648	9,668	5.87
Miscellaneous stone	1	W	W	4.50	1	(1)	(1)	(1)
Total ²	XX	4,376	19,657	4.49	XX	4,227	18,684	4.42
Total ^{3 4}	XX	4,824	19,657	4.08	XX	4,659	18,684	4.01

¹Revised. W Withheld to avoid disclosing company proprietary data; included with "Total." XX Not applicable.

²Excludes sandstone and miscellaneous stone.

³Data do not add to total shown because of independent rounding.

⁴One short ton is equal to 907 kilograms or 2,000 pounds. To convert metric tons to short tons, divide metric tons by 0.907185.

⁵Total shown in thousand short tons and thousand dollars.