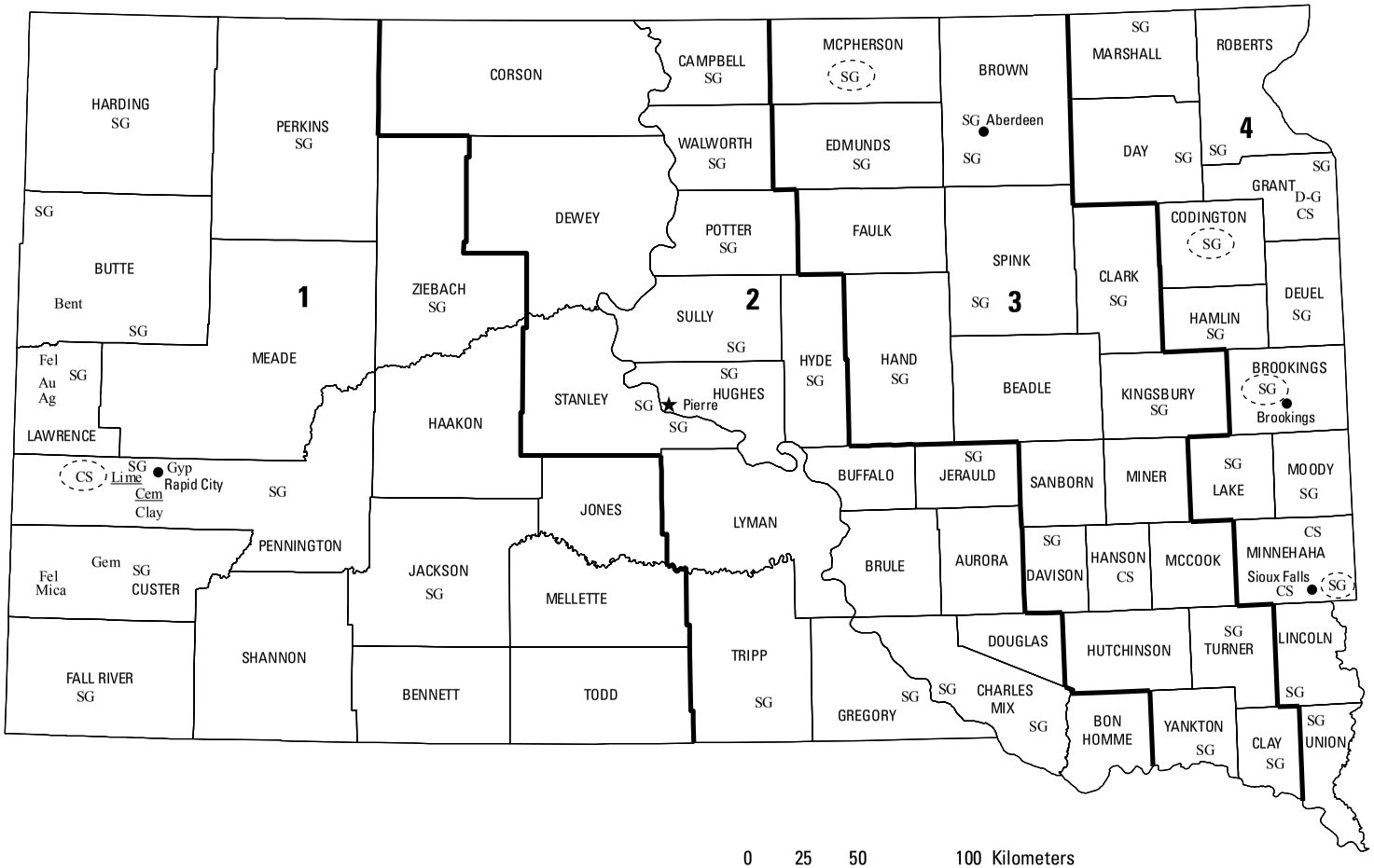
2008 Minerals Yearbook

SOUTH DAKOTA

U.S. Department of the Interior
U.S. Geological Survey

July 2012

SOUTH DAKOTA



LEGEND

County boundary

★ Capital

● City

1 Crushed stone/sand and gravel district boundary

MINERAL SYMBOLS
(Principal producing areas)

Ag	Silver
Au	Gold
Cem	Cement plant and quarry
Clay	Common clay
CS	Crushed stone
D-G	Dimension granite
Fel	Feldspar
Gem	Gemstones
Gyp	Gypsum
Lime	Lime plant and quarry
Mica	Mica
SG	Construction sand and gravel

Concentration of mineral operations

Source: South Dakota Geological Survey/U.S. Geological Survey (2008).

The Mineral Industry of South Dakota

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

In 2008, South Dakota's nonfuel raw mineral production[1] was valued at $246 million, based upon annual U.S. Geological Survey (USGS) data. This was a $16 million, or 6%, decrease from the State's total nonfuel mineral production value for 2007, which had increased by $29 million from 2006 to 2007. The State continued to be 39th in rank among the 50 States in total nonfuel mineral production. On a per-capita-basis, the State ranked 13th in the Nation in its mineral industry's value of nonfuel mineral production; with a population of about 805,000, the value of production was about $305 per capita.

Portland cement production, by value, continued to be South Dakota's leading nonfuel mineral commodity in 2008, after having surpassed gold in 2002; prior to 2002, gold had been the State's leading mineral commodity for more than 4 decades. Portland cement was followed (in descending order of value) by gold, construction sand and gravel, crushed stone, dimension stone, and lime. The State's production of construction materials, which mainly included (in descending order of value) portland cement, construction sand and gravel, crushed stone, dimension stone, common clays, and gypsum, accounted for 73% of the State's total nonfuel mineral production value.

In 2008, iron ore and gold had the largest percentage increases in production value of all the State's nonfuel mineral commodities. Smaller increases took place in the production values of lime, common clays, and mica (descending order of value). The most significant decrease in production value was in portland cement, followed by smaller decreases in construction sand and gravel, crushed stone, dimension stone, and feldspar. The production value of crude gypsum and gemstones were the same as that of 2007.

In 2008, South Dakota rose in rank to first from second of five mica-producing States, remained third in iron ore production, while it decreased in rank to 7th from 6th of 11 gold-producing States.

The following narrative information was provided by the South Dakota Department of Environment and Natural Resources (DENR)[2] in cooperation with DENR Geological Survey Program. Production data in the text that follows are those reported by the DENR Minerals and Mining Program (MMP) and are based upon MMP surveys and estimates. Data may differ from some production figures reported to the USGS.

Exploration and Permitting Activities

In 2008, there were a total of 505 active mine licenses issued to companies and individuals. An operator must obtain a license to mine for sand and gravel, pegmatite minerals, materials used in the process of making cement or lime, and rock to be crushed and used in construction. There were also mine permits that covered mining for bentonite, dimension stone, placer gold, and slate. Other minerals produced in the State in smaller amounts were agricultural lime, gypsum, iron ore, mica schist, pegmatite minerals (feldspar, mica, rose quartz), shale, and slate.

The number of gold exploration activities in 2008 decreased as compared with the previous years. Wharf Resources (USA) Inc. drilled 77 exploration holes at its mine near Lead in Lawrence County. Six principal producers of gold held 11 mine permits. Wharf, the only gold mine still actively mining in South Dakota, held four of the permits. No new mine permits were issued to large-scale gold operations in 2008. However, Wharf constructed a fifth leach pad in late summer and fall to hold additional ore from the American Eagle Pit in Lead City. The New leach pad will allow Wharf to continue mining through 2012. Two small placer (a prospecting club and an individual) operations reported exploration activities in the State. In June, Cappella Resources Ltd. was issued a permit for gold exploration near the South Dakota and Wyoming border in Lawrence County.

Commodity Review

Industrial Minerals

Limestone.—Limestone was produced in the Black Hills of western South Dakota with a reported production of 3.2 million metric tons (Mt). Limestone was used primarily in the production of cement and for construction projects.

Sand and Gravel, Construction, and Stone, Crushed.—Sand and gravel remained the major nonmetallic mineral commodity produced during 2008. Based upon data compiled by the MMP, 12.2 Mt of sand and gravel was produced in 2008. Sand and gravel was produced throughout the State and was used mainly for road construction. There was 3.2 Mt of quartzite produced and quarried from locations in southeastern South Dakota. Most of the quartzite was crushed and used in construction or for railroad ballast. Some larger blocks were used for riprap and occasionally for decorative purposes.

Stone, Dimension.—Dimension stone was mined by Dakota Granite Co. and Cold Spring Granite Co. from quarries near Milbank in northeastern South Dakota. Owing to its beauty and distinctive red color, the "mahogany" granite is used primarily

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 2008 USGS mineral production data published in this chapter are those available as of June 2010. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be retrieved over the Internet at URL http://minerals.usgs.gov/minerals.

[2]The DENR Minerals and Mining Program in cooperation with DENR Geological Survey Program provided information. E.H. Holm, M. Lees, and T. Cline, Jr., Natural Resources Project Engineer, Senior Hydrologist, and Environmental Project Scientist, respectively, with the Minerals and Mining Program, jointly authored the text of information provided by that program.

for monuments and building construction, and a considerable amount goes to international markets.

Metals

Gold and Silver.—Gold remained one of the leading mineral commodities in the State. Gold production and its value both increased in 2008. Wharf Resources Inc. production was 1,900 kilograms (kg) of gold, a slight increase compared with that of 2007 (Department of Environment and Natural Resources, 2009, p. 1–13). The average price of gold in 2008 was $871.96 per troy ounce, yielding a gross value of $53 million, a 32% increase from the 2007 gross value of $40 million. Wharf was the only company to report silver production, which is a byproduct of the gold recovery process. In 2008, Wharf recovered a total of 7,000 kg of silver. The average price of silver was $14.99 per troy ounce, with a value of $3.4 million. This is an increase from the 4,200 kg and $1.8 million reported in 2007 (Department of Environment and Natural Resources, 2009, p. 1–13).

Mineral Fuels and Related Materials

Uranium.—In 2008, Powertech Uranium, Corporation (USA) Inc. drilled 20 exploration holes in Custer and Fall River Counties and planned to close this initial uranium exploration permit in 2009. Powertech submitted an application for a second 30–hole uranium exploration permit for the same area, which was approved by the Board of Minerals and Environment in November.

In August, Powertech submitted a request for special, exceptional, critical, or unique determination, for a proposed in situ uranium mine in Custer and Fall River Counties. This is the first step in the process to obtain a large-scale mining permit. In December, the DENR determined that the area was not eligible for inclusion on the preliminary list of special, exceptional, critical, or unique lands. In late 2008, the Oglala Sioux Tribe, Defenders of the Black Hills, and two individuals filed petitions to declare the area special, exceptional, critical, and unique. The Board of Minerals and Environmental held a hearing in February 2009 to consider the petitions and the final decision was pending. Powertech collected archaeological, baseline water quality, soil, vegetation, and wildlife data in preparation for the permits. These data were needed for its proposed in situ uranium leach mining operations. The company submitted one permit application to the U.S. Environmental Protection Agency (EPA) for underground injection control (UIC) and one permit to the Nuclear Regulatory Commission for a source materials license. Permit applications for a UIC permit and a large-scale mine permit are pending. After being initially adopted in 2007 by the Board of Minerals and Environment, revision was made to the in situ leach mining regulations in 2008 to clarify timing and application completeness issues. Revision was also made to the State's UIC regulations to cover in situ leach mining operations and the regulations for capping, sealing, and plugging uranium and other mineral exploration test holes.

Environmental Issues and Mine Reclamation

The EPA continued acid water treatment at the Gilt Edge Superfund site located at Lead, Lawrence County. A total of 590 million liters were treated and discharged in 2008, with plans to continue this water treatment in 2009. A feasibility study outlining reclamation options for the site was completed.

In April, Wharf Resources was issued a notice of violation and order by the DENR for violations of its surface water discharge and mine permits. The violations were a result of discharges from its biotreatment facility. Wharf was required to upgrade its water treatment system, evaluate and clean up short stretches of two creeks below the mine, and pay a $149,300 penalty.

In 2008, work continued to convert the Homestake underground mine in Lead City to a deep underground science and engineering laboratory. Crews refurbished the mine infrastructure and began pumping out water that has been filling the mine since it was closed in 2001. It was expected that the water will be pumped down to the 1,500 meters (m) level by the spring 2009. Physics experiments can begin in an interim lab at that level later in the year. Additional water needs to be pumped and funding from the National Science Foundation needs to be obtained before a deep underground laboratory can be established at the 2,300 m level of the mine.

Reference Cited

South Dakota Department of Environment and Natural Resources, Minerals and Mining Program, 2009, Summary of the mining industry in South Dakota 2008: Pierre, SD, South Dakota Department of Environment and Natural Resources, May, 30 p. (Accessed December 16, 2010, at http://denr.sd.gov/des/mm/documents/Goldrpt08a.pdf.)

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN SOUTH DAKOTA[1, 2]

(Thousand metric tons and thousand dollars)

Mineral	2006		2007		2008	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	176	W	151	W	155	W
Sand and gravel, construction	16,500	60,000	13,900	50,500	12,300	47,100
Stone, crushed	6,760 r	43,800 r	5,430 r	36,600 r	5,390	34,300
Combined values of cement (portland), feldspar, gemstones (natural), gold, gypsum (crude), iron ore (usable shipped), lime, mica (crude), stone (dimension granite), and values indicated by symbol W	XX	129,000	XX	175,000	XX	164,000
Total	XX	232,000 r	XX	262,000 r	XX	246,000

[r]Revised. W Withheld to avoid disclosing company proprietary data. Withheld values included in "Combined values" data. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 2
SOUTH DAKOTA: CRUSHED STONE SOLD OR USED, BY TYPE[1]

Type	2007			2008		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands) r	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone	4	2,900 r	$15,500	4	2,830	$12,800
Granite	2 r	562 r	4,100	2	438	2,170
Sandstone & quartzite	3	1,970	17,000	3	2,120	19,300
Slate	1	1	7	1	8	43
Total	XX	5,430 r	36,600	XX	5,390	34,300

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

TABLE 3
SOUTH DAKOTA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2008, BY USE[1]

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch), other	W	W
Coarse aggregate, graded, other	W	W
Fine aggregate (-⅜ inch), other	W	W
Coarse and fine aggregates, other	W	W
Chemical and metallurgical, cement manufacture	(2)	(2)
Unspecified:[3]		
Reported	2,600	16,200
Estimated	2,200	12,000
Total	5,390	34,300

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]Withheld to avoid disclosing company proprietary data; included with "Unspecified: Reported."
[3]Reported and estimated production without a breakdown by end use.

TABLE 4
SOUTH DAKOTA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2008, BY USE AND DISTRICT[1, 2]

(Thousand metric tons and thousand dollars)

	District 1		District 3		District 4	
Use	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch)[3]	--	--	W	W	--	--
Coarse aggregate, graded[4]	--	--	W	W	--	--
Fine aggregate (-⅜ inch)[5]	--	--	W	W	--	--
Coarse and fine aggregate[6]	--	--	W	W	--	--
Chemical and metallurgical[7]	(8)	(8)	--	--	--	--
Unspecified:[9]						
Reported	1,600	6,100	--	--	993	10,100
Estimated	1,200	6,800	--	--	929	4,900
Total	2,830	12,900	633	6,450	1,920	15,000

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]No production for District 2.
[3]Includes other coarse aggregate.
[4]Includes other graded coarse aggregate.
[5]Includes other fine aggregate.
[6]Includes other coarse and fine aggregates.
[7]Includes cement manufacture.
[8]Withheld to avoid disclosing company proprietary data; included with "Unspecified: Reported."
[9]Reported and estimated production without a breakdown by end use.

TABLE 5
SOUTH DAKOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2008,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate and concrete products[2]	877	$4,160	$4.75
Plaster and gunite sands	48	399	8.31
Asphaltic concrete aggregates and other bituminous mixtures	326	1,950	5.99
Road base and coverings[3]	3,480	10,800	3.11
Fill	108	202	1.87
Snow and ice control	11	35	3.18
Other miscellaneous uses	122	1,320	10.79
Unspecified:[4]			
Reported	1,100	4,720	4.31
Estimated	6,200	23,400	3.78
Total or average	12,300	47,100	3.84

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (lime).
[4]Reported and estimated production without a breakdown by end use.

TABLE 6
SOUTH DAKOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2008,
BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Asphaltic concrete aggregates and road base materials[2]	122	562	322	752	405	1,070
Fill	(3)	(3)	4	8	36	83
Snow and ice control	(3)	3	2	8	W	W
Other miscellaneous uses[4]	37	386	139	664	6	75
Unspecified:[5]						
Reported	239	883	--	--	272	1,020
Estimated	2,270	8,490	1,330	5,200	1,230	4,600
Total	2,660	10,300	1,800	6,630	1,950	6,840

	District 4		Unspecified districts	
	Quantity	Value	Quantity	Value
Asphaltic concrete aggregates and road base materials[2]	2,680	9,500	281	893
Fill	68	111	--	--
Snow and ice control	W	W	--	--
Other miscellaneous uses[4]	872	4,780	--	--
Unspecified:[5]				
Reported	579	2,810	6	11
Estimated	1,380	5,160	--	--
Total	5,570	22,400	287	904

W Withheld to avoid disclosing company proprietary data; included in "Other miscellaneous uses." -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (lime).
[3]Less than ½ unit.
[4]Includes concrete aggregates, concrete products, and plaster and gunite sands.
[5]Reported and estimated production without a breakdown by end use.