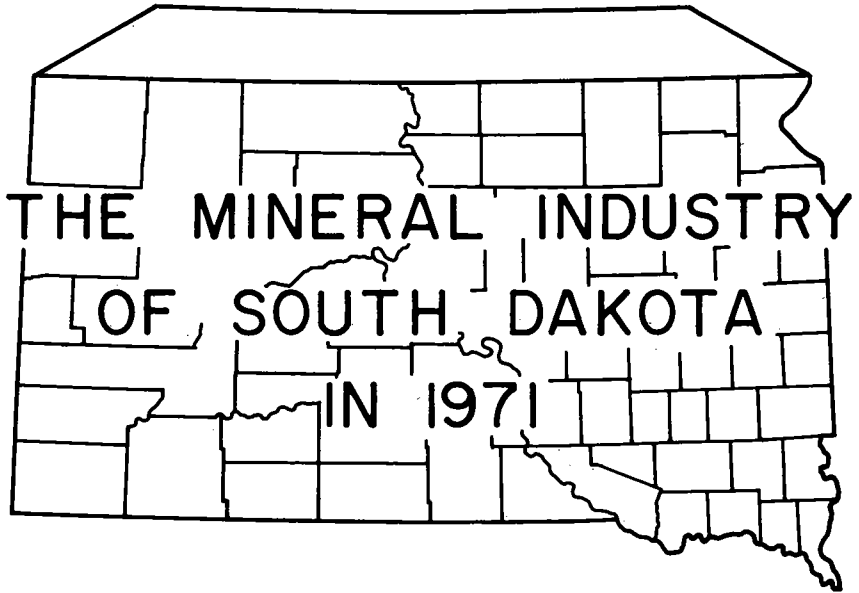


MINERALS REPORT 18



by J. M. West

SOUTH DAKOTA GEOLOGICAL SURVEY

DEPARTMENT OF NATURAL RESOURCE DEVELOPMENT

VERMILLION, SOUTH DAKOTA

SEPTEMBER, 1973

The Mineral Industry of South Dakota

This chapter has been prepared under a cooperative agreement between the Bureau of Mines, U. S. Department of the Interior, and the South Dakota State Geological Survey for collecting information on all minerals except fuels.

By J. M. West ¹

The value of mineral production in South Dakota reached an alltime high of \$63 million in 1971, 2 percent more than in 1970. Metals, principally gold, accounted for over one-third of the value and nonmetals for most of the balance. Petroleum accounted for about 1 percent of the total. The value for metals was \$23 million, about the same as in 1970, despite an increase in the value of gold to \$41.25 per ounce (average free market price). The value for nonmetals was \$39.4 million, up 3 percent, principally because of higher values for sand and gravel and cement. Fuels, consisting solely of petroleum, were

valued at \$0.6 million, 61 percent higher than in 1970.

Gold accounted for 34 percent of South Dakota's total mineral output. The State remained first in the Nation in gold production, with the Homestake mine at Lead reporting a production of 513,494 ounces of gold valued at over \$21 million.² Although value held about the same level as in 1970 owing to price increases, the quantity of gold produced in the State fell 11 percent.

¹ Physical scientist, Division of Nonferrous Metals.

² Homestake Mining Co. 1971 Annual Report, p. 4.

Table 1.—Mineral production in South Dakota ¹

Mineral	1970		1971	
	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays.....thousand short tons..	165	\$946	² 150	² \$128
Feldspar.....long tons..	17,211	114	22,000	589
Gem stones.....	NA	35	NA	40
Gold (recoverable content of ores, etc.)...troy ounces..	578,716	21,059	513,427	21,179
Gypsum.....thousand short tons..	15	61	21	83
Lead (recoverable content of ores, etc.)...short tons..	3	1	—	—
Mica (scrap and flake).....do.....	(³)	34	W	W
Petroleum (crude).....thousand 42-gallon barrels..	160	374	233	604
Sand and gravel.....thousand short tons..	16,556	16,656	16,727	18,392
Silver (recoverable content of ores, etc.)...thousand troy ounces..	120	212	107	165
Stone.....thousand short tons..	1,979	13,375	2,199	8,874
Zinc.....short tons..	1	(³)	—	—
Value of items that cannot be disclosed: Beryllium concentrate, cement (masonry and portland), clay (bentonite, 1971), lime, uranium, vanadium (1970), and items indicated by symbol W.....	XX	8,709	XX	12,984
Total.....	XX	61,576	XX	62,988
Total 1967 constant dollars.....	XX	55,080	XX	\$ 54,724

^p Preliminary. NA Not available. W Withheld to avoid disclosing individual company confidential data; included with "Value of items that cannot be disclosed." XX Not applicable.

¹ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

² Excludes bentonite; included with "Value of items that cannot be disclosed."

³ Less than ½ unit.

Table 2.—Value of mineral production in South Dakota, by county¹
(Thousands)

County	1970	1971	Minerals produced in 1971 in order of value
Aurora.....	W	W	Sand and gravel.
Beadle.....	\$317	W	Do.
Bon Homme.....	85	\$42	Do.
Brookings.....	321	779	Sand and gravel, stone.
Brown.....	302	181	Sand and gravel.
Brule.....	105	W	Do.
Buffalo.....	W	W	Do.
Butte.....	W	W	Clays, sand and gravel.
Campbell.....	188	303	Sand and gravel, stone.
Charles Mix.....	125	140	Sand and gravel.
Clark.....	W	155	Do.
Clay.....	W	W	Do.
Codington.....	681	840	Do.
Corson.....	W	W	Do.
Custer.....	200	685	Feldspar, sand and gravel, lime, stone.
Davison.....	130	W	Sand and gravel.
Day.....	223	W	Do.
Deuel.....	123	W	Do.
Dewey.....	W	W	Sand and gravel, petroleum.
Douglas.....	95	W	Sand and gravel.
Edmunds.....	W	313	Do.
Fall River.....	W	W	Uranium, sand and gravel, petroleum.
Faulk.....	W	140	Sand and gravel.
Grant.....	W	W	Stone, sand and gravel.
Gregory.....	W	154	Sand and gravel.
Hamlin.....	107	260	Do.
Hand.....	385	524	Do.
Hanson.....	W	W	Stone, sand and gravel.
Harding.....	W	605	Petroleum, sand and gravel.
Hughes.....	94	W	Sand and gravel.
Hutchinson.....	W	W	Do.
Hyde.....	W	(²)	Do.
Jerauld.....	29	48	Do.
Jones.....	W	W	Do.
Kingsbury.....	108	22	Do.
Lake.....	120	W	Do.
Lawrence.....	21,499	21,558	Gold, sand and gravel, silver, stone.
Lincoln.....	237	W	Sand and gravel.
Lyman.....	W	W	Do.
McCook.....	W	W	Do.
McPherson.....	234	W	Do.
Marshall.....	189	433	Do.
Meade.....	W	363	Sand and gravel, gypsum.
Mellette.....	154	W	Sand and gravel.
Miner.....	W	7	Do.
Minnehaha.....	W	W	Sand and gravel, stone.
Moody.....	166	157	Sand and gravel.
Pennington.....	8,503	12,313	Cement, stone, sand and gravel, lime, clays, mica (scrap), beryllium concentrate, feldspar.
Perkins.....	155	294	Sand and gravel.
Potter.....	W	W	Do.
Roberts.....	91	257	Do.
Sanborn.....	4	4	Do.
Shannon.....	34	35	Do.
Spink.....	W	W	Do.
Stanley.....	W	W	Do.
Sully.....	60	W	Do.
Todd.....	14	69	Do.
Tripp.....	W	133	Sand and gravel, stone.
Turner.....	W	W	Sand and gravel.
Union.....	W	134	Do.
Walworth.....	145	W	Do.
Washabaugh.....	W	W	Do.
Yankton.....	176	W	Do.
Ziebach.....	W	55	Do.
Undistributed ³	26,173	21,982	
Total ⁴	61,576	62,988	

W Withheld to avoid disclosing individual company confidential data; included with "Undistributed."

¹ Haakon, Bennett, and Jackson Counties not listed because no production was reported.

² Less than 1/2 unit.

³ Includes sand and gravel, and stone that cannot be assigned to specific counties, gem stones, and values indicated by symbol W.

⁴ Data may not add to totals shown because of independent rounding.

Early in the year the South Dakota Open Pit Mining Law was passed by the State Legislature to regulate surface mining. The State Health Department conducted a brief testing program to determine the location and extent of mercury contamination due to industrial discharges, and also to determine the location and sig-

nificance of naturally occurring mercury. An Environmental Enforcement Conference was held in Rapid City in October, at which the topics of discussion included pollution of Whitewood Creek and plans for pollution control by the Lead-Deadwood Sanitary District; mill wastes in Whitewood Creek and in the Belle

Table 3.—Indicators of South Dakota business activity

	1970 ^a	1971 ^b	Change, percent
Employment and labor force, annual average:			
Total labor force.....	thousands... 276.2	278.6	+0.9
Employment.....	do... 267.1	268.7	+0.6
Unemployment.....	do... 9.1	9.9	+8.8
Nonagricultural employment.....	do... 176.9	179.2	+1.3
Mining.....	do... 2.3	2.3	--
Construction.....	do... 7.2	7.4	+2.8
Manufacturing.....	do... 15.8	16.1	+1.9
Government.....	do... 55.5	56.4	+1.6
Other nonagricultural employment.....	do... 96.1	97.0	+ .9
Personal income:			
Total.....	millions... \$2,108	\$2,309	+9.5
Per capita.....	do... \$3,165	\$3,446	+8.9
Construction activity:			
Highway construction contracts awarded.....	thousands... \$54,201	\$50,471	-6.9
Cement shipments to and within the State.....	thousand 376-pound barrels... 1,289	1,710	+32.7
Number of authorized residential units.....	do... 2,440	2,585	+5.9
Value of nonresidential construction.....	millions... \$26.3	\$12.4	-52.9
Mineral production value.....	thousands... \$61,576	\$62,988	+2.3

^a Preliminary. ^b Revised.

Sources: Employment and Earnings, v. 18, No. 11, May 1972; Survey of Current Business, v. 52, No. 4, April 1972; Roads and Streets, April 1972.

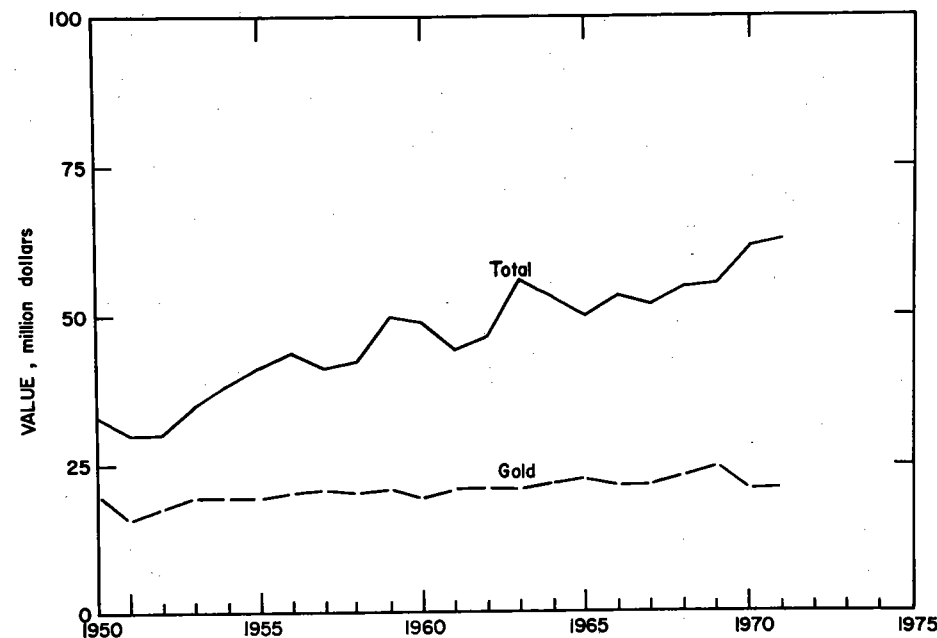


Figure 1.—Value of mine production of gold, and total value of mineral production in South Dakota.

Fourche and Cheyenne Rivers; arsenic concentrations in wells within the Cheyenne Basin; mercury hazards in fish; uranium and vanadium in liquid mill wastes at Edgemont; and stabilization of sand tailings at Edgemont. The Federal Environmental Protection Agency approved South Dakota's 1971 plan for water pollution control. Improvement and treatment of Lead and Deadwood mill and sanitary wastes was planned in nearby Centennial Valley, pending cost and environmental impact studies.

The 325,000-gallon-per-day experimental desalination plant at Webster was closed. The plant was among five original demonstration units built by the Office of Saline Water as authorized by Congress in 1958 and went into operation in 1962.

Coal-grinding tests were performed at the Consolidation Coal Co. lignite gasification pilot plant in Rapid City prior to startup, which was rescheduled for early 1972. Expenditures on the plant, chiefly financed by a grant from the Office of

Coal Research, U.S. Department of the Interior, reached \$13.2 million by yearend.

The Department of the Interior and the National Aeronautics and Space Administration signed a contract to build a \$4.8 million Earth Resources Observation Systems (EROS) information center at Sioux Falls, S. Dak. The center will receive sensor data from aircraft and spacecraft for resource and environmental purposes. The first EROS satellite was scheduled for launching in 1972 and, in preparation, the U.S. Geological Survey and the South Dakota State Geological Survey were completing topographic maps of unmapped portions of the State.

Among U.S. Geological Survey publications dealing with South Dakota in 1971 were a map³ and a bulletin describing uranium and other mineral deposits along with geology of a portion of Fall River County.⁴

Employment and Injuries.—The extent of employment and injuries in the mineral industry, exclusive of the petroleum industry, is shown in table 4.

REVIEW BY MINERAL COMMODITIES

NONMETALS

Cement.—Production and shipments of cement exceeded those of 1970 by about 40 percent. Output was reported at 2.19 million barrels (376-pound) of portland cement valued at \$8.56 million and 45,000 barrels (280-pound) of masonry cement valued at \$178,000.⁵ All production was from the State-owned plant operated by the South Dakota Cement Commission at

Rapid City, Pennington County. The Commission also maintained distribution terminals in Chamberlain and Aberdeen, South

³ King, R. V., and W. H. Raymond. Geologic Map of the Scenic Area, Pennington, Shannon, and Custer Counties, S. Dak. U.S. Geol. Survey Map I-662, 1971.

⁴ Bell, Henry, and E. V. Post. Geology of the Flint Hill Quadrangle, Fall River County, S. Dak. U.S. Geol. Survey Bull., 1063-M, 1971, pp. 505-586.

⁵ Rock Products. South Dakota Cement. V. 75, No. 3, March 1972, p. 100.

Table 4.—Worktime and injury experience in the mineral industries

Year and industry	Average men		Man-days worked (thousands)	Man-hours worked (thousands)	Number of injuries		Injury rates per million man-hours	
	working daily	Days active			Fatal	Nonfatal	Frequency	Severity
1970:								
Metal.....	1,621	312	506	4,058	3	98	24.89	5,805
Nonmetal.....	194	219	42	340	--	14	41.19	1,539
Sand and gravel..	825	184	151	1,366	--	29	21.22	763
Stone.....	524	240	126	1,071	1	31	29.87	6,138
Total ¹	3,164	261	826	6,836	4	172	25.75	4,637
1971: ^p								
Metal.....	1,680	310	520	4,167	1	91	22.08	2,712
Nonmetal.....	155	170	26	215	1	11	55.71	28,362
Sand and gravel..	820	166	137	1,340	1	34	26.12	5,068
Stone.....	540	260	140	1,160	--	32	27.58	804
Total ¹	3,200	258	824	6,883	3	168	24.85	3,650

^p Preliminary.

¹ Data may not add to totals shown because of independent rounding.

Dakota, and Bismarck, North Dakota. Construction of a 20,000-barrel-per-day capacity distribution terminal at Sioux Falls was planned in 1972. About three-fourths of the cement was used in the building industry and most of the remainder in highway construction. Nearly 80 percent of the total shipments were within the State, and most of the balance went to North Dakota and Wyoming. Raw materials consumed in cement production were as follows, in thousand tons: Limestone, 419; shale, 101; sand, 28; gypsum, 15; and iron ore, 6.

Clays.—Production of clays rose sharply in 1971. A sizable portion consisted of bentonite for oil well drilling; other types of clays were used for cement, lightweight aggregate, and bricks. The American Colloid Co. continued to operate the State's only bentonite-processing plant, using crude materials from South Dakota and Wyoming.

Feldspar.—Feldspar production increased 28 percent over that of 1970. Nearly all of the 22,000 tons produced came from Custer County. The bulk was sold to and processed by International Minerals and Chemical Corp. which operated a grinding plant at Custer. Products were shipped nationwide. Twenty mines were active in Custer County and two mines in Pennington County. A newly organized firm, Keystone Products Corp., began producing quartz

and feldspar products at Custer. Quartz planned an addition to its feldspar grinding plant at the Peerless property near Keystone.

Gypsum.—The South Dakota Cement Commission operated a small surface mine in Meade County, supplying its needs for gypsum as a cement ingredient. Production totaled 20,736 tons valued at \$83,000.

Lime.—The production of lime by two operators, Pete Lien & Sons, Rapid City, and the Black Hills Lime Co., Pringle, increased slightly in 1971 to a new record. The bulk of the output was hydrated lime, but some was quicklime. Consumption in South Dakota was 36,805 tons. Lime was also shipped to Colorado, North Dakota, and other States.

Mica.—A small tonnage of scrap and flake mica was produced by one mine in Pennington County.

Sand and Gravel.—Sand and gravel was produced in nearly every county. Of the total output of 16.7 million tons, 8.6 million (52 percent) was produced for governmental agencies. A total of 144 firms operated commercially. Production included 1.7 million tons of sand and 15 million tons of gravel. Counties leading in output were Minnehaha, Pennington, Codington, Brookings, and Hand, supplying 4.7 million tons, which was 28 percent of the total.

Table 5.—Sand and gravel sold or used by producers, by county
(Thousand short tons and thousand dollars)

County	1970			1971		
	Number of mines	Quantity	Value	Number of mines	Quantity	Value
Beadle.....	5	937	\$317	2	W	W
Bennett.....	1	15	W	--	--	--
Bon Homme.....	3	85	W	1	149	\$42
Brookings.....	9	385	313	5	552	773
Brown.....	8	343	302	3	163	181
Brule.....	3	118	105	1	W	W
Butte.....	4	122	96	1	W	W
Campbell.....	4	118	138	4	263	249
Charles Mix.....	9	143	125	2	121	140
Clark.....	1	W	W	1	108	155
Codington.....	12	723	681	8	753	840
Davison.....	8	161	130	2	W	W
Day.....	5	328	223	3	W	W
Deuel.....	5	181	123	1	W	W
Douglas.....	4	104	95	6	120	W
Edmunds.....	2	W	W	--	W	318
Fall River.....	2	W	W	2	136	W
Faulk.....	3	W	W	--	97	140
Gregory.....	6	W	W	3	192	154
Hamlin.....	5	174	107	4	270	260
Hand.....	14	446	385	6	524	524
Harding.....	3	W	W	1	60	26

See footnotes at end of table.

Table 5.—Sand and gravel sold or used by producers, by county—Continued
(Thousand short tons and thousand dollars)

County	1970			1971		
	Number of mines	Quantity	Value	Number of mines	Quantity	Value
Hughes	4	120	\$94	4	W	W
Hyde	2	W	W	1	41	(1)
Jerauld	2	80	29	1	40	\$48
Jones	2	75	W			
Kingsbury	7	112	108	5	180	22
Lake	7	177	120	2	W	W
Lawrence	4	271	194	4	W	W
Lincoln	8	279	237	3	W	W
McPherson	4	291	234	3	W	W
Marshall	7	162	189	3	367	433
Meade	1	65	79	1	186	280
Mellette	4	178	154		W	W
Miner	1	W	W	1	67	7
Minnehaha	14	892	803	15	1,741	1,734
Moody	6	215	166	4	238	157
Pennington	8	389	437	10	1,124	1,393
Perkins	8	116	155	4	231	294
Roberts	3	75	91	3	249	257
Sanborn	1	28	4	1	37	4
Shannon	2	45	34	2	47	35
Sully	3	W	60	3	W	W
Todd	1	25	14	1	61	69
Tripp	1	15	W		54	86
Union	1	W	W	1	102	134
Walworth	5	223	145	2	W	W
Yankton	5	272	176	4	W	W
Ziebach					31	55
Various	36			15	1,520	1,510
Undistributed ²	49	8,754	9,905	35	6,908	8,075
Total³	312	16,556	16,656	185	16,727	18,392

W Withheld to avoid disclosing individual company confidential data; included with "Undistributed."

¹ Less than 1/2 unit.

² Includes Aurora, Buffalo, Clay, Corson, Custer, Dewey, Grant, Hanson, Hutchinson, Lyman, McCook, Potter, Spink, Stanley, Turner and Washabaugh Counties.

³ Data may not add to totals shown because of independent rounding.

Table 6.—Sand and gravel sold or used by producers, by class of operation and use
(Thousand short tons and thousand dollars)

Class of operation and use	1970		1971	
	Quantity	Value	Quantity	Value
Commercial operations:				
Sand:				
Building	496	\$567	793	\$983
Fill	110	60	140	65
Paving	254	287	564	807
Other uses ¹	56	69	9	2
Total²	917	983	1,506	1,856
Gravel:				
Building	152	245	329	461
Fill	117	91	459	252
Paving	4,762	4,062	5,031	5,102
Miscellaneous	889	691	W	W
Other uses ³	179	165	793	546
Total²	6,098	5,254	6,611	6,362
Government-and-contractor operations:				
Sand:				
Fill	1	1	1	(4)
Paving	248	205	178	185
Other uses	26	13	--	--
Total²	274	218	179	185

See footnotes at end of table.

Table 6.—Sand and gravel sold or used by producers, by class of operation and use—Continued
(Thousand short tons and thousand dollars)

Class of operation and use	1970		1971	
	Quantity	Value	Quantity	Value
Government-and-contractor operations—Continued				
Gravel:				
Building	2	\$2	26	\$24
Fill	2	2	62	8
Paving	9,144	10,079	8,220	9,834
Other uses	118	118	122	122
Total²	9,266	10,201	8,430	9,989
Total sand and gravel²	16,556	16,656	16,727	18,392

W Withheld to avoid disclosing individual company confidential data; included with "Other uses."

¹ Includes unground sands (1970).

² Data may not add to totals shown because of independent rounding.

³ Includes railroad ballast, miscellaneous, and other gravel.

⁴ Less than 1/2 unit.

Table 7.—Stone sold or used by producers, by kind
(Thousand short tons and thousand dollars)

Kind of stone	1970		1971	
	Quantity	Value	Quantity	Value
Dimension:				
Limestone	W	W	--	--
Granite	63	\$10,409	36	\$5,654
Quartz	(1)	2	--	--
Crushed and broken:				
Limestone	1,043	1,052	1,426	1,621
Quartz	W	40	W	65
Quartzite	833	1,764	701	1,476
Traprock	3	8	3	6
Other stone	36	100	34	54
Total²	1,979	13,375	2,199	8,874

W Withheld to avoid disclosing individual company confidential data; included with "Other stone."

¹ Less than 1/2 unit; included with "Other stone."

² Data may not add to totals shown because of independent rounding.

Table 8.—Stone sold or used by producers, by use

Use	1970		1971	
	Quantity	Value (thousands)	Quantity	Value (thousands)
Dimension stone:				
Rough construction and rubble	W	W	W	W
Dressed architectural	1,557	W	225	W
Rough monumental	do	do	do	do
Dressed monumental	118	\$2,818	112	\$2,874
Flagging	W	W	--	--
Total (approximate thousand short tons)	68	10,462	36	5,654
Crushed and broken stone:				
Concentrate aggregates	453	847	506	856
Other road aggregates	777	1,276	899	1,527
Cement	310	213	419	273
Railroad ballast	207	(2)	173	(3)
Riprap and jetty stone	37	54	42	70
Other ³	125	518	125	494
Total⁴	1,911	2,913	2,164	3,220
Grand total⁴	1,979	13,375	2,199	8,874

W Withheld to avoid disclosing individual company confidential data; included in "Total."

¹ Includes a small amount of stone used for structural and sanitary purposes.

² Withheld to avoid disclosing individual company confidential data; included with "Other."

³ Includes stone used for agricultural lime, lime manufacture, other fillers; also roofing aggregates, stone sand, terrazzo, and refractories (1970 only), and small amounts of crushed and broken stone not listed or unspecified.

⁴ Data may not add to totals shown because of independent rounding.

Stone.—Production of stone was higher in tonnage but lower in value in 1971. Granite, quartzite, limestone, quartz, traprock, and miscellaneous stone were mined or quarried. Granite, mostly prepared for monumental or architectural stone, was valued at \$5.7 million, which was 64 percent of the total value of stone produced. The granite all came from Grant County, in the northeast corner of the State, and was supplied by five companies. Limestone and quartzite were valued at a total of \$3.1 million.

METALS

Gold and Silver.—The Homestake gold mine in Lead processed 1.8 million tons of ore from which over 513,400 ounces of gold and about 107,000 ounces of silver were recovered. The Homestake mine accounted for virtually all of the State's production of gold and silver. Output was lower than in 1970 because of a shortage of skilled miners and reassignment of available personnel to an ongoing deep level development program. Work prog-

ressed during the year with sinking of the No. 6 winze (Ross extension) from the 6800 level to the 7189 level and the excavation of a hoist room on the 4550 level. The program was begun in 1970 to develop ore lying between the 4850-foot and 6800-foot levels in the "Nineteen" and "Twenty-one" Ledges of the mine. Total ore reserves at yearend in the Homestake mine were estimated at 11 million tons averaging 0.336 ounces of gold per ton. Metallurgical recovery was down to 93 percent compared with 95 percent in 1970 owing to discontinuance of an amalgam process using mercury which was identified as a hazardous pollutant. After much testing of other processes, a Bureau of Mines carbon-in-pulp process was found promising and installation of an \$850,000 plant was authorized by the Homestake management. Plans were made to complete the new installation by early 1973, after which the slime treatment plant at Deadwood would serve no further purpose, owing to the substitution of the new process, and could be abandoned.

Table 9.—Mine production (recoverable) of gold and silver

	1969	1970	1971
Mines producing:			
Lode.....	2	2	1
Placer.....	1	--	--
Material sold or treated:			
Ore: Gold..... thousand short tons..	1,935	1,954	1,800
Production (recoverable):			
Quantity:			
Gold..... troy ounces.....	593,146	578,716	513,427
Silver..... do.....	124,497	119,766	106,785
Value:			
Gold..... thousands.....	\$24,621	\$21,059	\$21,179
Silver..... do.....	223	212	165
Total..... do.....	24,844	21,271	21,344

¹ Excludes placer gravel.

Table 10.—Homestake mine ore milled and receipts for bullion

Year	Ore milled (thousand short tons)	Receipts for bullion products	
		Total (thousands)	Per ton
1967.....	1,896	\$21,200	\$11.18
1968.....	1,922	22,064	11.48
1969.....	1,935	24,570	12.70
1970.....	1,954	21,059	10.78
1971.....	1,800	21,179	11.77

Source: Homestake Mining Co. Annual Reports.

Three miles below Deadwood on White-wood Creek, the New Era Mining Co. floated a steel boat on which thirty-six 8-foot Humphrey spiral classifiers were mounted and experimented on the recovery of placer gold and mercury from old mill wastes.

Iron Ore.—The Black Hills Conservancy Subdistrict went on record as opposed to development or patenting of iron-bearing claims in the Black Hills unless there were adequate safeguards to prevent serious degradation of land and water. Applications

had been filed for patents to claims held by several companies covering about 1,000 acres containing low-grade taconites.

Uranium.—Uranium production rose in 1971 and sales reached a record high. Susquehanna Corp., owner of Mines Development, Inc., which operated a mill at Edgemont, announced receipt of orders from three electric utility companies for delivery of an additional 3 million pounds of uranium oxide in 1971-75. As a result, stripping was started for another large pit north of Edgemont, and several additional pits were planned for development. Known reserves were estimated to be adequate for 3 years of operation at existing rates of extraction—about 650 tons of ore per day.

MINERAL FUELS

Coal (Lignite).—South Dakota's only coal mine, owned by Firesteel Coal Co. at Timber Lake, was closed. Consolidation Coal Co., subsidiary of Continental Oil Corp., continued construction of a pilot plant for experimental commercial-scale lignite gasification at Rapid City. Startup operations were scheduled for late 1971 or early 1972, utilizing char and lignite from North Dakota. Capacity of the pilot plant was set for 35 tons per day, and it was expected that successful tests might lead to future utilization of Harding County coal in northwestern South Dakota.

Petroleum.—Output of petroleum rose nearly 46 percent, largely as the result of a highly productive well brought in by Depco, Inc. in the new Red River Field

near Ludlow, Harding County. Production from 24 wells in the Buffalo field, northwest of Buffalo, Harding County, was 142,618 barrels in 1971, compared with 159,059 barrels in 1970, and included about 9 million cubic feet of natural gas used for repressuring. Four wells in the Barker Dome field of Fall River County, north of Edgemont, produced 6,388 barrels of oil in 1971. Investors Drilling Ventures began shipping a small quantity of oil from its group of wells in the Lantry area of Dewey County. A total of 4,596 barrels of oil had been produced, and about 1,000 barrels sold, since discovery in May 1970.

Exploration drilling declined in 1971, with less than half the holes and footage that were drilled in 1970. Only two of 35 holes drilled for oil were successful, one each in Dewey and Harding Counties (table 11). Texaco Oil Co. was reported planning to drill four test wells in Harding and Perkins Counties. In December, the State issued permits to Depco, Inc. for a deep test well planned for 9,050 feet in Harding County, and to Webb Resources, Inc., for two shallow test wells northeast of Ardmore and northwest of Edgemont, in Fall River County.

In November, the State reported an additional 42,159 acres leased on competitive bids for oil exploration in eight counties. The highest bid, \$11.32 per acre, was offered for a 640-acre tract in Harding County by Wood Petroleum Corp. of Oklahoma City.

Table 11.—Oil and gas well drilling completions, by county

County	Proved field wells ¹			Exploratory wells			Total	
	Oil	Gas	Dry	Oil	Gas	Dry	Wells	Footage
Butte.....	--	--	--	--	--	2	2	6,550
Corson.....	--	--	--	--	--	1	1	3,147
Custer.....	--	--	--	--	--	1	1	2,625
Dewey.....	--	--	--	1	--	--	1	5,066
Fall River.....	--	--	--	--	--	15	15	37,359
Harding.....	--	--	--	1	--	12	13	62,340
Perkins.....	--	--	--	--	--	2	2	8,850
Total.....	--	--	--	2	--	33	35	125,987

¹ Development wells as defined by American Petroleum Institute.

Source: American Petroleum Institute.

Table 12.—Principal producers

Commodity and company	Address	Type of activity	County
Beryllium:			
Jack Pendleton	Custer, S. Dak. 57730	Open pit	Pennington.
John Carter	608 St. Cloud Rapid City, S. Dak. 57701	do	Do.
L. W. Judson	Hermosa, S. Dak. 57744	See Mica	Do.
Merle Chase	do	Open pit	Do.
Cement:			
South Dakota Cement Commission	Drawer 351 Rapid City, S. Dak. 57701	Wet-process, 3-rotary-kiln plant.	Do.
Clays:			
American Colloid Co.	5100 Suffield Ct. Skokie, Ill. 60076	Open pit mine and plant	Butte.
Light Aggregates, Inc.	Box 1922 Rapid City, S. Dak. 57701	do	Pennington.
South Dakota Cement Commission	Drawer 351 Rapid City, S. Dak. 57701	Open pit mine	Do.
Feldspar:			
George Bland	Custer, S. Dak. 57730	2 open pit mines	Custer.
International Minerals & Chemical Corp., Industrial Minerals Division	Administration Center Old Orchard Rd. Skokie, Ill. 60079	4 open pit mines and dry-grinding plant.	Do.
Gold:			
Homestake Mining Co.	Lead, S. Dak. 57754	Underground mine, cyanidation mill, and refinery.	Lawrence.
Gypsum:			
South Dakota Cement Commission	Drawer 351 Rapid City, S. Dak. 57701	Open pit mine	Meade.
Lime:			
Pete Lien & Sons	Box 3124, P.O. Annex Rapid City, S. Dak. 57703	1-rotary-kiln, 1-vertical-kiln, continuous-hydrator plant.	Pennington.
Mica (scrap):			
L. W. Judson	Hermosa, S. Dak. 57744	Open pit mine	Do.
Northwest Beryllium Corp.	218-219 American National Bank Bldg. Rapid City, S. Dak. 57701	Stockpile	Do.
Petroleum:			
The Ozark Corp.	Box 2491 Casper, Wyo. 82601	Crude oil wells	Custer (Barker Dome field)
Pennzoil United, Inc.	900 Southwest Tower Houston, Tex. 77002	do	Harding (Buffalo field)
Phillips Petroleum Co.	Frank Phillips Bldg. Bartlesville, Okla. 74003	do	Do.
Sand and gravel (commercial):			
Aggregates, Inc.	Selby, S. Dak. 57472	Pit and plant	Lawrence.
Concrete Materials Co.	3000 West Madison St. Sioux Falls, S. Dak. 57104	Pit and 2 plants	Minnehaha.
F. J. McLaughlin Co.	Watertown, S. Dak. 57201	do	Codington.
Floyd Oberg & Sons Construction Co.	Colton, S. Dak. 57018	Pit	Minnehaha.
Hallett Construction Co.	Crosby, Minn. 56441	Pit	Spink.
L. G. Everist, Inc.	302 Paulton Bldg. Sioux Falls, S. Dak. 57102	2 pits and plants	Codington.
Pickus Construction Co.	Box 1414 Aberdeen, S. Dak. 57401	Pit and plant	Brookings.
Tom Luke Construction	Kimball, S. Dak. 57335	do	Pennington.
		3 pits	Brule.
		3 pits and plant	Davison.
		2 pits	Douglas.
		3 pits	Lyman.
Silver:			
Homestake Mining Co.	Lead, S. Dak. 57754	See Gold	Lawrence.
Stone:			
Cold Spring Granite Co.	Cold Spring, Minn. 56320	2 quarries	Grant.
Concrete Materials Co.	3000 West Madison Street Sioux Falls, S. Dak. 57104	Quarry and plant	Minnehaha.
Dakota Granite Co.	Box 269 Milbank, S. Dak. 57252	2 quarries	Grant.
Delano Granite Works, Inc.	Delano, Minn. 55328	Quarry	Do.
Hills Materials Co.	Box 1392 Rapid City, S. Dak. 57701	Quarry and plant	Pennington.

Table 12.—Principal producers—Continued

Commodity and company	Address	Type of activity	County
Stone—Continued			
L. G. Everist, Inc.	302 Paulton Bldg. Sioux Falls, S. Dak. 57102	Quarry and plant	Minnehaha.
Pete Lien & Sons	Box 3124, P.O. Annex Rapid City, S. Dak. 57703	do	Pennington.
Robert Hunter Granite Co., Inc.	Milbank, S. Dak. 57252	do	Do.
South Dakota Cement Commission	Drawer 351 Rapid City, S. Dak. 57701	Quarry	Grant.
Spencer Quarries, Inc.	Spencer, S. Dak. 57374	Quarry and plant	Pennington.
Steiner-Rausch Granite Co., Inc.	Ortonville, Minn. 56278	Quarry	Hanson.
		do	Grant.
Uranium:			
Susquehanna-Western, Inc.	Edgemont, S. Dak. 57735	Underground mine	Fall River.
Mines Development, Inc.	do	Acid-leach mill	Do.