THE MINERAL INDUSTRY OF NORTH 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 North Dakota Geological Survey for collecting information on all nonfuel minerals.

In 1996, North Dakota ranked 49th in the Nation in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The State was 48th in 1995. The estimated value for 1996 was $30 million, a 3% decrease from that of 1995. This followed a 23% increase from 1994 to 1995 (based on final 1995 data). The State accounted for about one-tenth of 1% of the U.S. total nonfuel mineral production value.

North Dakota's mine pits produced significant quantities of construction sand and gravel, the State's leading nonfuel mineral by value. This high-volume, low-value mineral commodity accounted for nearly 81% of the State's nonfuel mineral production value. Compared with 1995, construction sand and gravel increased in value in 1996, while lime showed a decrease for the year. In 1995, construction sand and gravel was responsible for most of the State's increase in total nonfuel mineral production value.

The following narrative information was provided by the North Dakota Geological Survey[2] (NDGS). Lime, produced as a byproduct in the State's three sugar beet refineries, was the second principal nonfuel mineral commodity produced in the State. Elemental sulfur recovered from oil refineries and gas processing plants, though not included in USGS statistics, was an important part of North Dakota's mineral economy. Elemental sulfur and other byproducts (krypton, xenon, anhydrous ammonia, ammonium sulfate, carbon dioxide, and liquid nitrogen) were recovered at fuel mineral operations including facilities for the processing of natural gas and the gasification of coal.

In the summer of 1996, a coal gasification plant at Beulah went on-line with an anhydrous ammonia plant that was capable of producing 1,100 metric tons[3] per day. The plant had been dismantled and shipped from Davenport, IO. A unique scrubber system was recently installed at the newly relocated plant that uses anhydrous ammonia and water in combination with flue gas to produce ammonium sulfate. The plant was projected to produce 500 tons of ammonium sulfate per day.

The NDGS completed a report on the State's Glauber's salt (sodium sulfate) reserves in the northwestern corner of the State. The project involved drilling at several lakes and incorporating this subsurface information with previous data reported by the Federal Emergency Relief Administration, the U.S. Bureau of Mines, and industry. The NDGS estimated that 42 million tons of Glauber's salt were present beneath 15 lakes in the northwest part of the State. A new development in this industry has been the concept of converting sodium sulfate to sodium bicarbonate by the addition of carbon dioxide and anhydrous ammonia. Ammonium sulfate is a byproduct of this procedure, but, as of yearsend, no commercial development of this technology had begun.

The NDGS continued entering all of the geologic information from its subsurface mineral program into a computerized spreadsheet. This information will be used for a number of purposes including redefining the State's uranium deposits.

In 1995, the NDGS published a general guide to the State's clay resources which included a historical review of clay utilization in the State. Also in 1995, the Hebron Brick Co., the only manufacturer of bricks in North Dakota, accounted for 75% of the clay mined in the State.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or 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 1996 USGS mineral production data published in this chapter are estimates as of February 1997. Construction sand and gravel estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset, and request Document # 1000 for a telephone listing of all mineral commodity specialists, or call USGS information at (703) 648-4000 for the specialist's name and number. This telephone listing may also be retrieved over the Internet at http: //minerals.er.usgs.gov/minerals/contacts/comdir.html

[2]Edward C. Murphy, Geologist, authored the text of State mineral industry information submitted by the North Dakota Geological Survey. He may be contacted at the same address and fax number as Dr. Bluemle, telephone: (701) 328-9700.

[3]All tons are metric unless otherwise specified.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN NORTH DAKOTA 1/ 2/

(Thousand metric tons and thousand dollars)

Minerals	1994		1995		1996 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays	59	W	59	W	59	W
Lime	W	6,590	W	W	W	W
Sand and gravel (construction)	6,810	18,500	8,420	23,900	8,500	24,500
Combined value of clays (common), gemstones, peat, sand and gravel (industrial), and values indicated by symbol W	XX	199	XX	7,300	XX	5,840
Total	XX	25,300	XX	31,200	XX	30,300

p/ Preliminary. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.
1/ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
2/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 2
NORTH DAKOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1995, BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate and concrete products 2/	420	$2,670	$6.35
Asphaltic concrete aggregates and other bituminous mixtures	381	1,150	3.02
Road base and coverings 3/	2,470	6,140	2.48
Fill	50	102	2.04
Snow and ice control	6	22	3.67
Other	21	134	6.38
Unspecified: 4/			
Actual	46	120	2.61
Estimated	5,030	13,500	2.69
Total or average	8,420	23,900	2.83

1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Includes plaster and gunite sands.
3/ Includes road and other stabilization (cement).
4/ Includes production reported without a breakdown by end use and estimates for nonrespondents.