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# 2005 Minerals Yearbook

## NORTH DAKOTA

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

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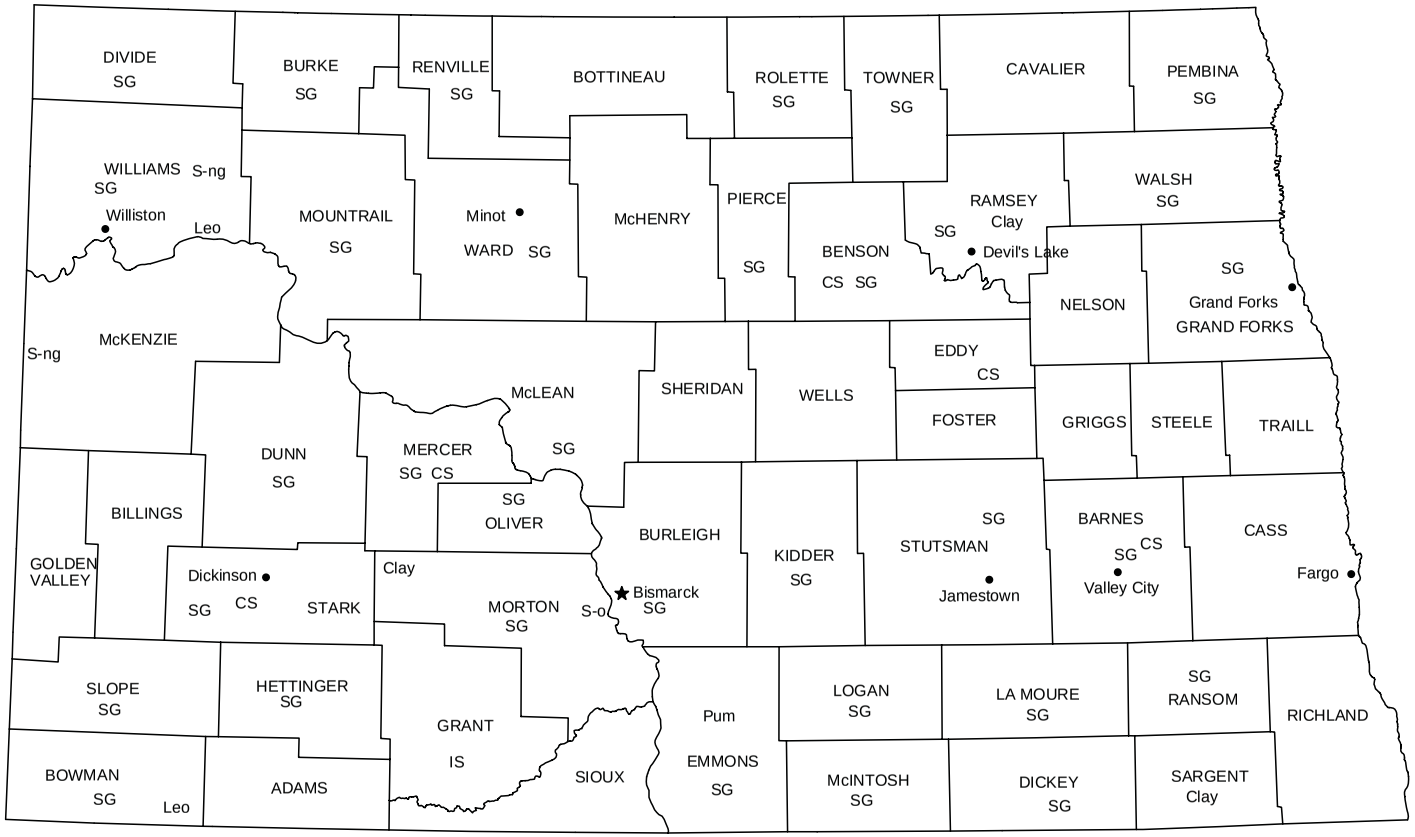


## LEGEND

- County boundary
- ★ Capital
- • City

### MINERAL SYMBOLS

**(Major producing areas)**

| | |
|---|---|
| Clay | Common clay |
| CS | Crushed stone |
| IS | Industrial sand |
| Leo | Leonardite |
| Pum | Pumicite |
| S-ng | Sulfur (natural gas) |
| S-o | Sulfur (oil) |
| SG | Construction sand and gravel |

0 50 Kilometers

**Source: North Dakota Geological Survey/U.S. Geological Survey (2005)**

# THE MINERAL INDUSTRY OF NORTH DAKOTA

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

In 2005, North Dakota's nonfuel raw mineral production was valued[1] at $45.6 million, based upon annual U.S. Geological Survey (USGS) data. This was a 2.9% increase from the State's total nonfuel mineral value for 2004, which was down 4.7% from that of 2003.

North Dakota's leading nonfuel mineral by value in 2005 continued to be construction sand and gravel, of which the State continued to produce significant quantities. This high-volume, low value commodity accounted for more than three-fourths of the State's nonfuel raw mineral production value. Lime was second by value, and crushed stone was third. In 2005, although construction sand and gravel production was down nearly 3.5%, the commodity's overall value rose slightly more than 5%, up $1.7 million, accounting for most of the State's increase in value for the year. The only decrease in value took place in crushed stone (company proprietary data); except for gemstones, the value of which remained unchanged, the State's other nonfuel minerals values rose slightly (table 1).

The following narrative information was provided by the North Dakota Geological Survey[2] (NDGS). Production data in the text that follows are those reported by the NDGS based upon that agency's own surveys and estimates.

## Commodity Review

### *Industrial Minerals*

During 2005, 15 surface mining operators in North Dakota reported information to the State Soil Conservation Committee (SSCC). The SSCC collects production data by volume, unlike the USGS, which collects data by mass or metric tons produced. Based on these reports, 97 hectares (ha) were affected. The quantity of minerals mined included 1,757,000 cubic meters ($m^3$) of sand and gravel, 59,000 $m^3$ of clay, 25,000 $m^3$ of scoria, and 24,000 $m^3$ of crushed stone totaling 1,870,000 $m^3$ of mineral material. From 55 pits, ranging in size from more than 0.1 ha to 8 ha, a total of 525,000 $m^3$ of overburden was disturbed.

***Common clays.***—All of the clay mined in the State during this period was mined by the Hebron Brick Co. to produce brick. One-third to one-half of the clay mined for the manufacturer of brick was kaolinite.

***Leonardite.***—Leonardite is an oxidized lignite. Currently, Georesources, Inc. of Williston and American Colloid Co. of Scranton are the only leonardite mining operations in North Dakota, although the companies mining lignite routinely encounter leonardite. The two companies produced a combined total of approximately 78,000 metric tons (t) of leonardite in 2005, a 23% increase from 2004. Leonardite is processed and used as a dispersant and viscosity control in oil well drilling muds, as a stabilizer for ion-exchange resins in water treatment, and as a soil conditioner.

***Pumice and Pumicite.***—Volcanic ash (pumicite) has been mined intermittently from the Linton area since 1970. In 2005, less than 100 t was mined by NURTURE, Inc., a Minneapolis-based company that produces and distributes a growing line of volcanic ash-base products. The NDGS recently determined this deposit contains one billion tons of pumicite.

## Legislation and Government Programs

The SSCC, as designated by the State legislature, continues to administer the Surface Mining Report Law, which required any person conducting surface mining operations for minerals other than coal to comply with the reporting requirements of North Dakota Century Code Chapter 38-16. Minerals included under the law are cement rock, clay, gravel, limestone, manganese, molybdenum, peat, potash, pumicite, salt, sand, scoria, stone, sodium sulfate, zeolite, or other minerals except coal. The SSCC has the regulatory authority to administer the reporting requirement, while the actual regulatory authority for most of these mining activities rests with the North Dakota Department of Mineral Resources. The law requires that any person or company that within one calendar year removes 7,650 $m^3$ (10,000 cubic yards) or more of earthen materials or products (including overburden) affecting 0.2 ha (one-half acre) or more in combined mining operations must report the particulars of their surface mining activities. Some operators of smaller operations cooperate by voluntarily submitting summary reports to the SSCC, although not required to by law. Nevertheless, because not all operations report, the summary of surface mining statistics presented above is a conservative estimate of the amount of nonfuel minerals mined in North Dakota in 2005.

Information about North Dakota's nonfuel mineral resources, as well as fuel minerals and uranium, is available on the minerals page of the NDGS Web site at URL https://www.dmr.nd.gov/ndgs/.

[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 2005 USGS mineral production data published in this chapter are those available as of December 2006. 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]Edward C. Murphy, State Geologist, authored the text of State mineral industry information provided by the North Dakota Geological Survey.

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

(Thousand metric tons and thousand dollars)

| Mineral | 2003 | | 2004 | | 2005 | |
|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Clays, common | W | W | W | 186 | 76 | W |
| Gemstones | NA | 4 | NA | 4 | NA | 4 |
| Sand and gravel, construction | 13,500 | 35,900 | 11,700 | 32,800 | 11,300 | 34,500 |
| Stone, crushed | W | W | W | W | 89 | 396 |
| Combined values of lime, sand and gravel (industrial), stone [crushed limestone, volcanic cinder, and miscellaneous (2003), crushed granite, traprock, volcanic cinder, miscellaneous (2004)], and values indicated by symbol W | XX | 10,600 | XX | 11,300 r | XX | 10,800 |
| Total | XX | 46,500 | XX | 44,300 r | XX | 45,600 |

rRevised. NA Not available. 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
NORTH DAKOTA: CRUSHED STONE SOLD OR USED, BY KIND

| Kind | 2004 | | | 2005 | | |
|---|---|---|---|---|---|---|
| | Number of quarries | Quantity (thousand metric tons) | Value (thousands) | Number of quarries | Quantity (thousand metric tons) | Value (thousands) |
| Granite | 1 | W | W | 1 | 23 | $103 |
| Traprock | 1 | W | W | 1 | 10 | 43 |
| Volcanic cinder and scoria | 1 | W | W | 1 | 42 | 186 |
| Miscellaneous stone | 3 r | W | W | 1 | 14 | 64 |
| Total | XX | W | W | XX | 89 | 396 |

rRevised. W Withheld to avoid disclosing company proprietary data. XX Not applicable.

TABLE 3
NORTH DAKOTA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2005, BY USE[1]

(Thousand metric tons and thousand dollars)

| Use | Quantity | Value |
|---|---|---|
| Construction, Coarse aggregate, graded, concrete aggregate (coarse) | 9 | $43 |
| Unspecified, reported[2] | 80 | 353 |
| Total | 89 | 396 |

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Reported production without a breakdown by end use.

TABLE 4
NORTH DAKOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2005,
BY MAJOR USE CATEGORY[1]

| Use | Quantity (thousand metric tons) | Value (thousands) | Unit value |
|---|---|---|---|
| Concrete aggregate (including concrete sand) | 111 | $778 | $7.01 |
| Asphaltic concrete aggregates and other bituminous mixtures | 795 | 2,650 | 3.33 |
| Road base and coverings | 2,930 | 9,510 | 3.24 |
| Road stabilization (cement) | 21 | 35 | 1.67 |
| Fill | 210 | 433 | 2.06 |
| Snow and ice control | 8 | 22 | 2.75 |
| Railroad ballast | 9 | 65 | 7.22 |
| Unspecified:[2] | | | |
| Reported | 2,650 | 7,730 | 2.92 |
| Estimated | 4,500 | 13,300 | 2.92 |
| Total or average | 11,300 | 34,500 | 3.06 |

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Reported and estimated production without a breakdown by end use.