

THE MINERAL INDUSTRY OF WISCONSIN

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

In 2000, the estimated value¹ of nonfuel mineral production for Wisconsin was \$349 million, based upon preliminary U.S. Geological Survey (USGS) data. This was a marginal increase from that of 1999² and followed a 7.7% increase in 1999 from that of 1998. The State was 35th in rank among the 50 States in total nonfuel mineral production value, of which Wisconsin accounted for almost 1% of the U.S. total.

Construction sand and gravel and crushed stone were, by value, Wisconsin's leading nonfuel minerals in 2000 and accounted for about 40% and 38%, respectively, of the State's total nonfuel mineral value. These were followed by lime, industrial sand and gravel, and dimension stone (table 1). Whereas the quantity of dimension stone produced increased by about 12%, the unit value overall showed a decrease. In 1999, nearly all of the State's nonfuel mineral commodities contributed more dollars (value) to the State's mineral economy than the year before. Construction sand and gravel led with a \$12 million increase, followed by crushed stone (up \$10 million), dimension stone (up \$2.6 million), and lime (up \$1.6 million). Also up slightly were silica stone and gemstones (in descending order of change); peat was unchanged. The only significant decrease was a \$2.5 million drop in industrial sand and gravel (table 1).

Based upon USGS estimates of the quantities of minerals produced in the 50 States for 2000, Wisconsin remained second of 2 States that produced silica stone, third in dimension stone, and fourth in industrial sand and gravel. While the State rose to 8th from 10th in construction sand and gravel, it also was a significant producer of crushed stone and lime.

The following narrative information was provided by the Wisconsin Geological and Natural History Survey (WGNHS).³ Nicolet Minerals Co. (now owned by BHP Billiton, Ltd.) continued to prepare information in response to Wisconsin

¹The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon 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 2000 USGS mineral production data published in this chapter are preliminary estimates as of July 2001 and are expected to change. For some mineral commodities, such as construction sand and gravel and crushed stone, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. A telephone listing of the specialists may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals/contacts/comdir.html>, by using MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset (request Document #1000 for a telephone listing of all mineral commodity specialists), or by calling USGS information at (703) 648-4000 for the specialist's name and number. All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>; facsimile copies may be obtained from MINES FaxBack.

²Values, percentage calculations, and rankings for 1999 may vary from the Minerals Yearbook, Area Reports: Domestic 1999, Volume II, owing to the revision of preliminary 1999 to final 1999 data. Data for 2000 are preliminary and are expected to change; related rankings may also change.

³Thomas J. Evans, Geologist, authored the text of mineral industry information submitted by the WGNHS.
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Department of Natural Resources (WDNR) comments on selected parts of the company's completed Environmental Impact Report (EIR) for its proposed Nicolet Mine. The underground mining project under proposal was for the development of the 50-million-metric-ton zinc-copper massive-sulfide ore body known as the Crandon deposit. During 2000, the review of the EIR and the various permit applications and requests for license approvals centered on the continued evaluation of the output of complex computer models that describe the projected impact of the proposed mine on ground water resources in the immediate Crandon area. At issue were (1) the projected amount of ground water inflow into the underground mine workings and how those resulting volumes of water might affect water-treatment strategies; (2) what the effects would be of the ground water base flow into surrounding lakes and streams; and (3) other related issues, such as the impacts on ground water quality because of mine re-flooding. A draft Environmental Impact Statement, to be prepared by the WDNR, was expected to be ready for public review and comment by the end of calendar year 2001.

For the second year in a row, no exploratory drill holes were initiated or completed in Wisconsin, and no substantive mineral leasing activity occurred. The WGNHS attributed the lack of interest in exploration drilling and mineral leasing, in part, to industry concern with the ongoing review of the Nicolet Mine project and the length of time involved in such review under Wisconsin's mining regulations.

Legislation and Government Programs

Administrative rules, prepared by the WDNR, that clarify the setup and operation of an irrevocable trust agreement between a potential mine operator and the State were formally adopted in 2000. The irrevocable trust rules placed into effect a new requirement under Wisconsin law requiring a mining applicant to establish an irrevocable trust account for the purpose of providing financial guarantees that are adequate to address unforeseen environmental damages related to the mining operation. This additional financial requirement went beyond previously existing bonding and other payments and liability requirements by creating the mechanisms that make funding available for possible mining-related damages that are not already covered under existing regulations.

Legislative activity in 2000 was very limited. All mining-related legislation proposed in 1999 expired without there having been hearings in committee.

Mine Reclamation

The reclamation of the Flambeau Mine near Ladysmith continued in 2000 with notable success. Following the cessation of mining of high-grade copper-gold ore in 1997, Flambeau Mining Co. filled in its 13-hectare (32-acre) open pit mine, reshaped and revegetated the site, and restored 3 hectares

(8 acres) of wetlands. Flambeau approached the WDNR for a declaration of completeness regarding the ongoing reclamation. An announcement was expected sometime in 2001, after which the WDNR must formally assess the stability of the reclaimed

mine site and the quality of the reclamation in terms of the requirements identified in the company's mine permit. The \$12 million reclamation bond was expected to remain in place for several more years of evaluation and monitoring of the site.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN WISCONSIN 1/ 2/

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1998		1999		2000 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Gemstones	NA	5	NA	6	NA	6
Lime	582	35,400	618	37,000	620	37,200
Sand and gravel:						
Construction	34,700	116,000	35,700	128,000	37,600	140,000
Industrial	1,750	34,500	1,730	32,000	1,730	32,000
Stone:						
Crushed	31,200	127,000	34,500	137,000	32,000	131,000
Dimension metric tons	77,100	10,800	85,500	13,400	95,800	9,110
Combined values of peat and silica stone 3/	XX	(4/)	XX	(4/)	XX	(4/)
Total 5/	XX	323,000	XX	348,000	XX	349,000

p/ Preliminary. NA Not available. 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.

3/ Includes grindstone, pulpstone, and sharpening stones; excludes grinding pebbles and mill liners.

4/ Value excluded to avoid disclosing company proprietary data.

5/ Partial total; excludes values that must be concealed to avoid disclosing company proprietary data.

TABLE 2
WISCONSIN: CRUSHED STONE SOLD OR USED BY PRODUCERS BY KIND 1/

Kind	1998				1999			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone 2/	174 r/	22,600 r/	\$94,300 r/	\$4.18 r/	160	26,800	\$109,000	\$4.06
Dolomite	12 r/	2,270 r/	9,850 r/	4.34 r/	11	2,440	9,310	3.81
Granite	6	2,210	6,530	2.95	7	1,260	5,150	4.08
Sandstone and quartzite	4	2,340	9,040	3.87	4	2,170	7,050	3.25
Traprock	4	1,790	7,070	3.94	4	1,780	6,690	3.76
Total or average	XX	31,200	127,000	4.07	XX	34,500	137,000	3.98

r/ Revised. XX Not applicable.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Includes "limestone-dolomite" reported with no distinction between the two.

TABLE 3
WISCONSIN: CRUSHED STONE SOLD OR USED BY PRODUCERS
IN 1999, BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1 1/2 inch):			
Macadam	W	W	W
Riprap and jetty stone	146	\$712	\$4.88
Filter stone	188	860	4.57
Other coarse aggregate	1,450	6,180	4.25
Coarse aggregate, graded:			
Concrete aggregate, coarse	1,110	5,430	4.91
Bituminous aggregate, coarse	1,440	5,970	4.16
Bituminous surface-treatment aggregate	214	1,130	5.30
Railroad ballast	W	W	W
Other graded coarse aggregate	181	808	4.46
Fine aggregate (-3/8 inch):			
Stone sand, concrete	16	57	3.56
Stone sand, bituminous mix or seal	30	120	4.00
Screening, undesignated	1,050	4,250	4.07
Coarse and fine aggregates:			
Graded road base or subbase	6,240	25,100	4.02
Unpaved road surfacing	77	372	4.83
Terrazzo and exposed aggregate	W	W	W
Crusher run or fill or waste	514	1,890	3.67
Other coarse and fine aggregates	1,390	7,110	5.13
Other construction materials	93	387	4.16
Agricultural:			
Agricultural limestone	327	2,750	8.42
Other agricultural uses	(3/)	(3/)	(3/)
Chemical and metallurgical:			
Cement manufacture	(3/)	(3/)	(3/)
Lime manufacture	239	1,040	4.36
Special, roofing granules	365	1,380	3.77
Unspecified: 4/			
Reported	9,720	36,100	3.71
Estimated	9,680	35,500	3.67
Total or average	34,500	137,000	3.98

W Withheld to avoid disclosing company proprietary data; included with "Other."

1/ Includes dolomite, granite, limestone, limestone-dolomite, sandstone and quartzite, and traprock.

2/ Data are rounded to no more than three significant digits; may not add to totals shown.

3/ Withheld to avoid disclosing company proprietary data; included in "Total."

4/ Reported and estimated production without a breakdown by end use.

TABLE 4
WISCONSIN: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1999,
BY USE AND DISTRICT 1/ 2/

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction:								
Coarse aggregate (+1 1/2 inch) 3/	434	1,430	W	W	400	1,740	W	W
Coarse aggregate, graded 4/	1,740	7,100	W	W	282	1,280	W	W
Fine aggregate (-3/8 inch) 5/	433	1,540	W	W	365	1,550	W	W
Coarse and fine aggregate 6/	2,680	10,200	1,820	7,470	2,510	11,600	610	2,560
Other construction materials	W	W	--	--	W	W	--	--
Agricultural 7/	86	504	W	W	W	W	--	--
Chemical and metallurgical 8/	W	W	--	--	W	W	--	--
Unspecified: 9/								
Reported	W	W	--	--	W	W	2,350	7,670
Estimated	2,200	8,000	2,100	7,300	3,800	14,000	200	790
Total	7,970	30,400	5,870	25,400	7,630	31,500	3,200	11,100
Use	District 5		District 6		District 8		Unspecified	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction:								
Coarse aggregate (+1 1/2 inch) 3/	W	W	--	--	W	W	W	W
Coarse aggregate, graded 4/	W	W	--	--	W	W	--	--
Fine aggregate (-3/8 inch) 5/	W	W	--	--	--	--	W	W
Coarse and fine aggregate 6/	W	W	29	141	165	659	W	W
Other construction materials	W	W	--	--	--	--	--	--
Agricultural 7/	W	W	W	W	W	W	--	--
Chemical and metallurgical 8/	W	W	--	--	--	--	--	--
Unspecified: 9/								
Reported	W	W	W	W	--	--	--	--
Estimated	49	190	88	340	1,300	5,000	--	--
Total	6,010	23,700	1,790	7,010	1,510	5,790	486	2,230

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 reported in District 7.

3/ Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.

4/ Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and other graded coarse aggregate.

5/ Includes screening (undesignated), stone sand (bituminous mix or seal), stone sand (concrete), and other fine aggregate.

6/ Includes crusher run (select material or fill), graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, and other coarse and fine aggregates.

7/ Includes agricultural limestone and other agricultural uses.

8/ Includes cement manufacture and lime manufacture.

9/ Reported and estimated production without a breakdown by end use.

TABLE 5
WISCONSIN: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1999,
BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	7,190	\$30,100	\$4.18
Plaster and gunite sands	34	232	6.82
Concrete products (blocks, bricks, pipe, decorative, etc.)	222	914	4.12
Asphaltic concrete aggregates and other bituminous mixtures	2,350	7,970	3.40
Road base and coverings	6,650	21,100	3.18
Road and other stabilization (cement and lime)	956	4,320	4.52
Fill	1,660	4,840	2.92
Snow and ice control	195	625	3.21
Railroad ballast	64	214	3.34
Other miscellaneous uses 2/	366	2,050	5.61
Unspecified: 3/			
Reported	8,510	30,400	3.57
Estimated	7,500	25,000	3.33
Total or average	35,700	128,000	3.59

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Includes filtration and roofing granules.

3/ Reported and estimated production without a breakdown by end use.

TABLE 6
WISCONSIN: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1999,
BY USE AND DISTRICT 1/

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	553	2,770	2,300	9,160	1,980	7,090
Concrete products (blocks, bricks, pipe, decorative, etc.) 2/	W	W	121	461	12	26
Asphaltic concrete aggregates and other bituminous mixtures	425	1,420	844	3,440	272	682
Road base and coverings	22	96	1,890	6,320	1,480	4,110
Road stabilization (cement and lime)	69	229	W	W	--	--
Fill	184	608	617	1,970	476	1,010
Snow and ice control	44	115	48	202	35	116
Railroad ballast	--	--	--	--	--	--
Other miscellaneous uses 3/	182	1,040	947	4,300	49	141
Unspecified: 4/						
Reported	1,180	4,480	5,410	20,000	4	7
Estimated	2,500	9,700	1,600	5,500	700	2,300
Total	5,190	20,400	13,800	51,300	4,990	15,400
	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	966	4,400	W	W	819	4,110
Concrete products (blocks, bricks, pipe, decorative, etc.) 2/	W	W	--	--	W	W
Asphaltic concrete aggregates and other bituminous mixtures	W	W	--	--	W	W
Road base and coverings	682	2,440	--	--	727	2,930
Road stabilization (cement and lime)	--	--	--	--	W	W
Fill	132	471	--	--	140	633
Snow and ice control	W	W	W	W	W	W
Railroad ballast	W	W	--	--	--	--
Other miscellaneous uses 3/	298	1,420	43	222	262	1,100
Unspecified: 4/						
Reported	1,400	4,360	387	1,320	28	47
Estimated	360	1,200	50	200	800	2,500
Total	3,830	14,300	477	1,700	2,750	11,300
	District 7		District 8		Unspecified districts 5/	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	132	543	248	997	W	W
Concrete products (blocks, bricks, pipe, decorative, etc.) 2/	W	W	W	W	--	--
Asphaltic concrete aggregates and other bituminous mixtures	W	W	308	752	53	294
Road base and coverings	332	961	1,150	2,630	374	1,650
Road stabilization (cement and lime)	--	--	--	--	5	26
Fill	62	89	37	58	7	7
Snow and ice control	20	41	W	W	--	--
Railroad ballast	W	W	W	W	--	--
Other miscellaneous uses 3/	132	326	44	161	159	785
Unspecified: 4/						
Reported	40	66	68	113	--	--
Estimated	460	1,300	1,000	2,600	--	--
Total	1,180	3,310	2,870	7,350	604	2,800

W Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses." -- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Includes gunite and plaster sands.

3/ Includes filtration and roofing granules.

4/ Reported and estimated production without a breakdown by end use.

5/ Includes production within the State with no district reported.