

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 1999, the preliminary estimated value¹ of nonfuel mineral production for Wisconsin was \$334 million, according to the U.S. Geological Survey (USGS). This was an increase of 3% from that of 1998,² and followed a 9.8% decrease in 1998 from that of 1997.

Crushed stone and construction sand and gravel were, by value, Wisconsin's leading nonfuel minerals in 1999, and accounted for 40% and 36%, respectively, of the State's total nonfuel mineral value. In 1999, these two mineral commodities accounted for nearly all of Wisconsin's increase in value; dimension stone, silica stone, and gemstones increased slightly, in descending order of change. Only two minerals showed value decreases (table 1). In 1998, crushed stone and construction sand and gravel also increased in value but were outweighed by decreases in other minerals. The most significant portion of the State's decrease in value from 1997 to 1998 resulted from the cessation of copper, gold, and silver production following the 1997 closing of the Flambeau Mine, Rusk County. Dimension stone also decreased in value in 1998 (table 1).

Based upon USGS estimates of the quantities of minerals produced in the 50 States for 1999, Wisconsin was 2d of 2 States that produced silica stone; remained 4th in dimension stone, 5th in industrial sand and gravel, and 10th in construction sand and gravel; and 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. completed the development of its Environmental Impact Report (EIR) for its proposed Nicolet Mine, a large, underground mining project for the development of the 50-million-metric-ton zinc-copper massive-sulfide ore

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 1999 USGS mineral production data published in this chapter are preliminary estimates as of May 2000, 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 for 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 1998 may vary from the Minerals Yearbook, Area Reports: Domestic 1998, Volume II, owing to the revision of preliminary 1998 to final 1998 data. Data for 1999 are preliminary and are expected to change; related rankings may also be subject to change.

³Thomas J. Evans, Geologist, authored the text of mineral industry information submitted by the WGNHS.

body known as the Crandon deposit. The EIR described, in detail, the nature of the mining proposal, the physical setting of the proposed mining site, and the projected socioeconomic impacts of the project. The EIR and the various permit applications and license approvals were the focus of regulatory review by the Wisconsin Department of Natural Resources (WDNR) in 1999. The last element of the proposed project remaining to be resolved in the review is the computer modeling of the projected impact of the proposed mine on ground water resources in the immediate Crandon area. The EIR review should be completed during summer 2000 and a draft environmental impact statement that will be prepared by the WDNR may be ready for public review and comment by the end of that year (Alberts, 2000; Skillings Mining Review, 2000).

In 1999, metallic mineral exploration in Wisconsin essentially stopped; no exploratory drill holes were initiated or completed in Wisconsin for the first time in more than 30 years. In addition, no substantive mineral leasing activity appears to have taken place. According to conversations with representatives of the Wisconsin mineral industry, the decline in exploration and leasing can be attributed to industry concern with the ongoing review of the Nicolet Mine project and the length of time involved in permitting review under Wisconsin's mining regulations.

Legislative activity in 1999 centered on several proposed statutory changes and the review of proposed administrative rules. Proposed legislation in 1999 included bills to prohibit the granting of exemptions under administrative rules pertaining to metallic mining, prospecting, and disposal of mining solid waste, to expand the information requirements under the State's "bad actor" law (two separate proposals), to prohibit any discharge into the Wisconsin River from a metal mining operation, and to prohibit metal mining on State land. None of these proposals were adopted; several had been introduced in previous legislative sessions.

Two packages of administrative rules prepared by the WDNR were the subject of review in 1999 by the Legislature. This review included proposed rules that would require the development of a long-term irrevocable trust agreement for any metal mining operation in the State and a petition requesting the WDNR to enter into formal rule making for the so-called mining moratorium law. The proposed irrevocable trust agreement rules define a new requirement under Wisconsin law that a mining applicant must establish an irrevocable trust account to provide adequate financial guarantees to address unforeseen environmental damages related to the mining operation. This additional financial requirement goes beyond existing bonding and other payments and liability requirements to create a mechanism for funding possible mining-related damages that were not already covered under existing regulations. The final administrative rule was under legislative review and was expected to be approved in 2000. A petition submitted by several Wisconsin legislators to the WDNR Natural Resources Board in 1999 requested that rules be

developed to clarify the WDNR's interpretation of the State's controversial "moratorium" law, which had been enacted by the Legislature in 1998. In early 1999, Nicolet Minerals Co. submitted information that addressed the requirement of a newly adopted Wisconsin statute to identify mine sites in rock materials capable of producing acid mine drainage where mines have operated for at least 10 years and mines that have been closed for a minimum of 10 years without causing significant environmental pollution. Nicolet Minerals submitted information on three mines purporting to address the operational requirement (McLaughlin Mine near San Francisco, CA), the closure requirement (Cullaton Lake Mine in Nunavit Territory in Canada), and both of the operational and closure requirements (Sacaton Mine near Casa Grande, AZ). As of the end of 1999, the WDNR had declined to prepare administrative rules by citing the clear language of the statute, the extensive legislative debate on the law, and the Legislature's decision at

the time the law was prepared to not require the development of such rules.

The Flambeau Mine near Ladysmith, WI, continued its reclamation program following the cessation of mining of high-grade copper-gold ore in 1997. The 13-hectare open pit mine had been filled and the site reshaped and revegetated. The development of restored wetlands, hiking trails for recreational access, and other aspects of the reclamation plan were in the second full year of development at the end of 1999.

References Cited:

- Alberts, Dale, 2000, Enlibra—In practice—Developing mining practices in compliance with Native American standards: *Skillsings Mining Review*, v. 89, no. 42, October 14, p. 4-6.
 Skillsings Mining Review, 2000, Crandon, WI zinc-copper project improved by public involvement: *Skillsings Mining Review*, v. 89, no. 10, March 4, p. 6.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1997		1998		1999 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Gemstones	NA	5	NA	5	NA	6
Lime	597	35,100	582	35,400	580	35,200
Peat	5	256	W	W	W	W
Sand and gravel:						
Construction	33,500	110,000	34,700	116,000	34,900	119,000
Industrial	1,710	33,800	1,750	34,500	1,750	34,300
Stone:						
Crushed	28,700	120,000	31,200	127,000	32,200	135,000
Dimension metric tons	100,000	13,100	77,100	10,800	73,000	11,000
Combined values of other industrial minerals	XX	46,600	XX	(3/)	XX	(3/)
Total	XX	358,000	XX	323,000 4/	XX	334,000 4/

p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary 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.

3/ Value excluded to avoid disclosing company proprietary data.

4/ Partial total, excludes values of copper (1997), gold (1997), silica stone 5/ (1997-98), silver (1997), and values indicated by symbol W that must be concealed to avoid disclosing company proprietary data.

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

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

Kind	1997				1998			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone 2/	150 r/	20,600 r/	\$89,900 r/	\$4.37 r/	176	22,500	\$94,100	\$4.19
Dolomite	10	1,560	6,570	4.20	10	2,350	10,100	4.29
Granite	7	2,210	4,790	2.17	6	2,210	6,530	2.95
Sandstone and quartzite	4	2,070	9,300	4.50	4	2,340	9,040	3.87
Traprock	4 r/	2,300 r/	9,070 r/	3.94 r/	4	1,790	7,070	3.94
Total or average	XX	28,700	120,000	4.16	XX	31,200	127,000	4.07

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 1998, BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	W	W	\$5.09
Riprap and jetty stone	102	\$643	6.30
Filter stone	169	850	5.03
Other coarse aggregate	973	4,300	4.42
Coarse aggregate, graded:			
Concrete aggregate, coarse	1,450	6,740	4.66
Bituminous aggregate, coarse	525	2,450	4.67
Bituminous surface-treatment aggregate	219	1,020	4.67
Railroad ballast	W	W	4.34
Other graded coarse aggregate	377	1,580	4.20
Fine aggregate (-3/8 inch):			
Stone sand, concrete	W	W	5.82
Stone sand, bituminous mix or seal	W	W	3.52
Screening, undesignated	619	2,560	4.13
Other fine aggregate	71	390	5.49
Coarse and fine aggregates:			
Graded road base or subbase	7,150	29,300	4.09
Unpaved road surfacing	1,090	2,930	2.70
Terrazzo and exposed aggregate	W	W	3.87
Crusher run or fill or waste	595	2,350	3.95
Other coarse and fine aggregates	944	3,910	4.14
Other construction materials	81	300	3.70
Agricultural limestone	378	3,150	8.34
Chemical and metallurgical:			
Cement manufacture	W	W	1.90
Lime manufacture	W	W	4.21
Other chemical and metallurgical	232	962	4.15
Special: Roofing granules	(3/)	(3/)	3.31
Other miscellaneous uses: Refractory stone (including ganister)	(3/)	(3/)	3.58
Unspecified: 4/			
Actual	7,430	29,200	3.93
Estimated	8,450	33,200	3.93
Total or average	31,200	127,000	4.07

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

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

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

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 1998,
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 aggregates:								
Coarse aggregate (+1 1/2 inch) 3/	187	767	W	W	161	724	W	W
Coarse aggregate, graded 4/	898	3,580	W	W	504	2,240	16	144
Fine aggregate (-3/8 inch) 5/	151	692	W	W	339	1,430	W	W
Coarse and fine aggregate 6/	2,900	11,000	2,280	9,370	2,460	9,980	1,300	4,020
Other construction materials	3	19	1,850	9,090	77	276	9	77
Agricultural 7/	127	730	(8/)	(8/)	(8/)	(8/)	--	--
Chemical and metallurgical 9/	(8/)	(8/)	--	--	(8/)	(8/)	--	--
Special 10/	--	--	--	--	(8/)	(8/)	--	--
Other miscellaneous uses 11/	--	--	--	--	(8/)	(8/)	--	--
Unspecified: 12/								
Actual	(8/)	(8/)	(8/)	(8/)	--	--	2,450	9,160
Estimated	1,880	7,210	1,980	7,520	3,010	12,000	189	728
Total	6,870	26,400	6,270	27,700	6,800	27,700	3,960	14,100
	District 5		District 6		District 8		Unspecified districts	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch) 3/	W	W	--	--	13	65	--	--
Coarse aggregate, graded 4/	268	1,180	--	--	W	W	(8/)	(8/)
Fine aggregate (-3/8 inch) 5/	17	56	--	--	--	--	--	--
Coarse and fine aggregate 6/	W	W	38	191	W	W	(8/)	(8/)
Other construction materials	411	2,090	--	--	204	745	--	--
Agricultural 7/	36	266	(8/)	(8/)	32	140	--	--
Chemical and metallurgical 9/	--	--	--	--	--	--	--	--
Special 10/	--	--	--	--	--	--	--	--
Other miscellaneous uses 11/	--	--	--	--	--	--	--	--
Unspecified: 12/								
Actual	3,260	13,500	(8/)	(8/)	--	--	--	--
Estimated	46	179	83	316	1,270	5,250	--	--
Total	4,040	17,300	1,130	4,840	1,520	6,200	579	2,570

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials." -- 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 concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.

5/ Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesigned), 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 graded coarse aggregate.

7/ Includes agricultural limestone.

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

9/ Includes cement manufacture and lime manufacture.

10/ Includes roofing granules.

11/ Includes refractory stone (including ganister).

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

TABLE 5
WISCONSIN: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1998,
BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate	6,420	\$24,500	\$3.82
Plaster and gunite sands	43	292	6.79
Concrete products (blocks, bricks, pipe, decorative, etc.)	434	1,820	4.20
Asphaltic concrete aggregates and other bituminous mixtures	1,910	7,230	3.78
Road base and coverings 2/	6,880	22,100	3.21
Fill	1,620	4,080	2.52
Snow and ice control	128	413	3.23
Other miscellaneous uses 3/	238	1,340	5.64
Unspecified: 4/			
Actual	8,580	29,600	3.45
Estimated	8,470	24,200	2.85
Total or average	34,700	116,000	3.33

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

2/ Includes road and other stabilization (cement and lime).

3/ Includes filtration, railroad ballast, and roofing granules.

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

TABLE 6
 WISCONSIN: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1998,
 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 2/	1,500	6,100	3,020	11,200	1,170	4,050
Concrete products (blocks, bricks, pipe, decorative, etc.)	W	W	352	1,470	W	W
Asphaltic concrete aggregates and other bituminous mixtures	W	W	477	1,680	244	616
Road base and coverings 3/	29	126	2,680	10,200	975	2,540
Fill	125	380	851	2,500	292	518
Snow and ice control	W	W	17	87	5	17
Other miscellaneous uses 4/	W	W	W	W	16	56
Unspecified: 5/						
Actual	1,170	4,060	5,310	18,300	--	--
Estimated	2,440	6,560	2,440	6,560	1,700	3,870
Total	4,510	17,500	14,800	50,600	4,400	11,600
Use	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate 2/	272	1,440	W	W	344	1,620
Concrete products (blocks, bricks, pipe, decorative, etc.)	W	W	--	--	W	W
Asphaltic concrete aggregates and other bituminous mixtures	131	1,530	--	--	158	509
Road base and coverings 3/	208	571	--	--	198	3,740
Fill	187	447	1	2	30	43
Snow and ice control	W	W	13	24	58	119
Other miscellaneous uses 4/	W	W	--	--	--	--
Unspecified: 5/						
Actual	494	1,250	W	W	W	W
Estimated	422	1,410	30	95	901	2,770
Total	1,720	6,660	247	944	2,760	8,900
Use	District 7		District 8		Unspecified districts 6/	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate 2/	W	W	305	911	W	W
Concrete products (blocks, bricks, pipe, decorative, etc.)	--	--	W	W	--	--
Asphaltic concrete aggregates and other bituminous mixtures	38	108	509	1,270	W	W
Road base and coverings 3/	164	402	1,480	3,870	151	654
Fill	56	67	76	121	--	--
Snow and ice control	W	W	8	53	--	--
Other miscellaneous uses 4/	--	--	W	W	--	--
Unspecified: 5/						
Actual	--	--	84	526	1,300	4,840
Estimated	863	2,450	897	2,360	--	--
Total	1,230	3,450	3,380	9,230	1,670	6,540

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/ Includes plaster and gunite sands.

3/ Includes road and other stabilization (cement and lime).

4/ Includes filtration, railroad ballast, and roofing granules.

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

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