

# THE MINERAL INDUSTRY OF TEXAS

**This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the University of Texas at Austin, Bureau of Economic Geology, for collecting information on all nonfuel minerals.**

In 1998, the preliminary estimated value<sup>1</sup> of nonfuel mineral production for Texas was \$1.92 billion, according to the U.S. Geological Survey (USGS). This was nearly an 8% increase from that of 1997,<sup>2</sup> following about a 2.9% increase from 1996 to 1997. For the second consecutive year, Texas ranked fifth in the Nation in total nonfuel mineral production value, of which the State accounted for almost 5% of the U.S. total.

Nearly 83% of Texas' nonfuel mineral value came from the production of the State's top five industrial minerals, in descending order of value: portland cement, crushed stone, construction sand and gravel, lime, and salt. (The following mineral listings are in descending order of relative change in value.) In 1998, significant increases in the values of crushed stone, construction sand and gravel, and portland cement, plus a relatively moderate increase in industrial sand and gravel provided most of the State's overall rise in value (table 1). This was mitigated somewhat by decreases in the values of Frasch sulfur, magnesium metal, natural sodium sulfate, and grade-A helium. In November, Dow Chemical Co. shut down magnesium metal production at its Freeport plant (Olafson, 1998, p. 2c). Dow concluded that damage from recent storms had resulted in continued production problems and costs had become too high to keep the operation going. This affected 200 Dow employees at the plant and 300 contract workers. Most other nonfuel minerals increased in value except talc, kaolin, salt, dimension stone, and fuller's earth, all of which showed small decreases; gemstones and ball clay remained unchanged.

In 1997, portland cement, industrial sand and gravel, Frasch sulfur, and construction sand and gravel value increases contributed the most to Texas \$50 million net increase in total value. Increases of more than \$2 million each occurred in lime, crude gypsum, natural sodium sulfate, and salt. Only magnesium metal, dimension stone, and crushed stone showed

<sup>1</sup>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 1998 USGS mineral production data published in this chapter are preliminary estimates as of February 1999 and are expected to change. For some mineral commodities (for example, construction sand and gravel, crushed stone, and portland cement), 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 <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 <http://minerals.usgs.gov/minerals/>; facsimile copies may be obtained from MINES FaxBack.

<sup>2</sup>Values, percentage calculations, and rankings for 1997 may vary from the *Minerals Yearbook, Area Reports: Domestic 1997, Volume II*, owing to the revision of preliminary 1997 to final 1997 data. Data for 1998 are preliminary and expected to change, while related rankings may also be subject to change.

significant decreases for the year. All other changes were smaller and inconsequential to the State's net change in value.

Based on USGS estimates of the quantities of minerals produced in the 50 States in 1998, Texas climbed in rank to 1st<sup>2</sup> from 2d in crushed stone, to 2d from 3d in construction sand and gravel, and to 10th from 12th in dimension stone. The State remained first of three magnesium metal-producing States; second in portland cement, salt, crude gypsum, talc, and zeolites (this listing and those to follow are in descending order of value); second in each of two Frasch sulfur-, two sodium sulfate-, and three crude helium-producing States; and virtually tied for second in ball clay. The State continued to rank third in common clays and grade-A helium; fourth in industrial sand and gravel; sixth in lime and magnesium compounds; and eighth in masonry cement. Production of greensand marl commenced in 1998, and Texas was second of two producing States.

Magnesium metal, extracted from seawater, was the only metal produced from the State's natural resources. In addition to the production of magnesium metal, the Texas metal industry produced raw steel, primary aluminum, copper, lead, and smaller amounts of other metals. Sources of plant feed included scrap metal and ores acquired from other domestic or foreign sources. Texas produced an estimated 4.24 million metric tons of raw steel, as reported by the American Iron and Steel Institute. Based on USGS data, the State ranked ninth in primary aluminum production.

A Mexican group purchased the bankrupt Border Steels Rolling Mills of El Paso and its in-house scrap company, Metals Processing. Grupo Villacero is leading a consortium that includes two prominent families of Houston. A 2-year, \$20 million investment plan is expected to increase the melt shop capacity to 400,000 tons (Steel Times International, 1998). North Star Steel Co. announced the elimination of 185 jobs, almost one-third of its workforce, at its rod mill in Beaumont, effective November 24. The company cited an unusually great influx of imported wire rod (New Steel, 1998).

The following narrative information was provided by the Texas Bureau of Economic Geology (BEG).<sup>3</sup> The Texas' nonfuel mineral industry continued to grow during 1998, especially in the construction sectors. The increase in population and growth in industry spurred activity in mineral production by creating a demand for materials used in developing infrastructure. Production of aggregates and other industrial minerals needed for manufacturing building products responded to changes in construction activity.

According to the Texas Workforce Commission, employment in construction and manufacturing industries related to mineral products showed increases during 1998. The annual growth rate for jobs in construction was 4.9%. Jobs related to stone, clay, and glass products increased by

<sup>3</sup>L. Edwin Garner, Research Associate, authored the text of mineral industry information submitted by the Texas Bureau of Economic Geology.

3.8% and those related to concrete, gypsum, and plaster products increased by about 5.6% from December 1997 through December 1998. However, annual job growth in nonfuel and fuel mineral mining combined decreased 3.3% from December 1997 through December 1998 (Griffis, 1998). Persistently low crude oil prices affected the mining, construction, and manufacturing industries in Texas that support drilling activities. This overall decrease was the result of extensive layoffs in the oil and gas industries.

Exploration for nonfuel minerals in Texas showed no significant increase during 1998. The BEG, however, received several inquiries about possible sources of clays, industrial sands, limestone, and sand and gravel materials.

Overall, activity in the nonfuel mineral industry was above

average during 1998. According to the BEG, the current trends of continually increasing population and commercial development support its projection that production of the State's mineral resources used in infrastructure will continue to grow in the near future.

### References Cited

- Griffis, Clayton, ed., 1998, Texas Labor Market Review: Austin, TX, Texas Workforce Commission, 8 p.  
 New Steel, 1998, North Star Beaumont to cut one-third of workforce: New Steel, v. 14, no. 11, November, p. 24.  
 Olafson, Steve, 1998, Dow magnesium plant to shut down in Freeport: Houston [TX] Chronicle, November 20, p. 2c.  
 Steel Times International, 1998, United States fears overcapacity: Steel Times International, v. 22, no. 1, January, p. 3.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1996		1997		1998 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
<b>Cement:</b>						
Masonry	216	20,300 e/	203	18,900 e/	207	19,900
Portland	8,240	532,000 e/	8,280	576,000 e/	8,580	610,000
<b>Clays:</b>						
Ball	101	W	W	W	W	W
Common	2,290	15,000	2,150	13,600	2,200	13,800
Kaolin	28	W	35	7,600	W	W
<b>Gemstones</b>	NA	511	NA	11	NA	11
<b>Gypsum, crude</b>	2,240	12,100	2,260	15,700	2,250	16,300
<b>Lime</b>	1,360	87,100 r/	1,470	91,500	1,520	91,900
<b>Salt</b>	9,700	88,900	9,780	91,000	9,700	89,800
<b>Sand and gravel:</b>						
Construction	61,300	278,000	60,100	284,000	67,500	328,000
Industrial	1,420	38,200	1,830	48,800	1,870	55,500
<b>Stone:</b>						
Crushed	86,400 r/	341,000	81,000 r/	338,000 r/	93,000	465,000
Dimension		metric tons				
Talc and pyrophyllite		do.				
Zeolites		do.				
Zeolites	W	NA	W	NA	NA	NA
Combined values of clays [bentonite (1997-98), fuller's earth], greensand marl, helium, magnesium compounds, magnesium metal, sodium sulfate (natural), sulfur (Frasch), and values indicated by symbol W	XX	293,000	XX	281,000	XX	223,000
<b>Total</b>	XX	1,730,000	XX	1,780,000 r/	XX	1,920,000

e/ Estimated. p/ Preliminary. r/ Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "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 three significant digits; may not add to totals shown.

TABLE 2  
TEXAS: CRUSHED STONE SOLD OR USED, BY KIND 1/

Kind	1996				1997			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	118	82,500	\$323,000	\$3.92	109	77,400	\$322,000	\$4.16
Dolomite	1	W	W	2.95	1	W	W	3.06
Marble	28	W	W	20.56	11	W	W	20.33
Calcareous marl	2	W	W	2.27	2	W	W	2.24
Granite	2	W	W	6.25	2	W	W	6.02
Traprock	2	W	W	6.69	1	W	W	7.44
Sandstone	5	746	5,090	6.82	5	709	4,910	6.92
Volcanic cinder	2	W	W	4.45	1	156	809	5.19
Miscellaneous stone	3	W r/	W r/	2.38 r/	3	W	W	2.46
Total	XX	86,400 r/	341,000 r/	3.94 r/	XX	81,000	338,000	4.17

r/ Revised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

1/ Data are rounded to three significant digits, except unit value; may not add to totals shown.

TABLE 3  
TEXAS: CRUSHED STONE SOLD OR USED BY PRODUCERS  
IN 1997, BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	297	\$2,090	\$7.03
Filter stone	468	3,680	7.87
Other coarse aggregate 3/	1,570	5,380	3.43
Coarse aggregate, graded:			
Concrete aggregate, coarse	12,300	64,900	5.29
Bituminous aggregate, coarse	5,010	31,300	6.24
Bituminous surface-treatment aggregate	846	5,660	6.68
Other graded coarse aggregate 4/	4,780	24,900	5.22
Fine aggregate (-3/8 inch):			
Stone sand, concrete	4,130	14,900	3.62
Stone sand, bituminous mix or seal	1,420	10,300	7.25
Screening, undesignated	889	2,100	2.36
Other fine aggregate	144	399	2.77
Coarse and fine aggregates:			
Graded road base or subbase	17,800	63,000	3.54
Unpaved road surfacing	159	343	2.16
Terrazzo and exposed aggregate	3	157	52.33
Crusher run or fill or waste	2,780	7,590	2.73
Other coarse and fine aggregates	1,960	5,260	2.68
Other construction materials	110	614	5.58
Agricultural: Other agricultural uses 5/	439	3,410	7.77
Chemical and metallurgical:			
Cement manufacture	11,500	30,900	2.68
Lime manufacture	1,240	6,360	5.15
Flux stone	W	W	6.33
Sulfur oxide removal	W	W	4.53
Special:			
Asphalt fillers or extenders	W	W	10.42
Whiting or whiting substitute	W	W	22.94
Other fillers or extenders	449	3,500	7.78
Unspecified: 6/			
Actual	2,680	8,270	3.09
Estimated	9,130	28,100	3.08
Total	81,000	338,000	4.17

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

1/ Includes calcareous marl, dolomite, granite, limestone, marble, miscellaneous stone, sandstone, traprock, and volcanic cinder and scoria.

2/ Data are rounded to three significant digits, except unit value; may not add to totals shown.

3/ Includes macadam.

4/ Includes railroad ballast.

5/ Includes agricultural limestone and poultry grit and mineral food.

6/ Includes reported and estimated production without a breakdown by end use.

TABLE 4  
TEXAS: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1997,  
BY USE AND DISTRICT 1/2/

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch) 3/	(4/)	3	W	W	W	W
Coarse aggregate, graded 5/	65	432	W	W	W	W
Fine aggregate (-3/8 inch) 6/	5	30	W	W	W	W
Coarse and fine aggregate 7/	9	100	W	W	W	W
Other construction materials	--	--	288	1,780	848	6,070
Agricultural 8/	--	--	--	--	--	--
Chemical and metallurgical 9/	--	--	--	--	(10/)	(10/)
Special 11/	--	--	--	--	--	--
Unspecified 12/						
Actual	--	--	--	--	--	--
Estimated	866	2,630	221	791	(10/)	(10/)
Total	946	3,200	509	2,570	3,180	13,500
Use	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch) 3/	W	W	W	W	24	168
Coarse aggregate, graded 5/	W	W	11,900	59,400	--	--
Fine aggregate (-3/8 inch) 6/	W	W	3,050	8,430	--	--
Coarse and fine aggregate 7/	W	W	3,720	13,900	132	641
Other construction materials	2,020	9,260	--	--	--	--
Agricultural 8/	--	--	(10/)	(10/)	--	--
Chemical and metallurgical 9/	495	1,830	5,210	15,200	--	--
Special 11/	--	--	(10/)	(10/)	--	--
Unspecified 12/						
Actual	--	--	1,190	5,520	--	--
Estimated	1,010	2,580	3,310	8,650	38	104
Total	3,520	13,700	29,500	124,000	194	913
Use	District 7		District 9		Unspecified districts	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch) 3/	2,250	10,400	--	--	--	--
Coarse aggregate, graded 5/	9,610	58,900	--	--	--	--
Fine aggregate (-3/8 inch) 6/	3,230	17,900	--	--	--	--
Coarse and fine aggregate 7/	15,300	49,900	2,170	6,670	--	--
Other construction materials	(10/)	(10/)	70	212	--	--
Agricultural 8/	(10/)	(10/)	--	--	--	--
Chemical and metallurgical 9/	6,400	18,100	--	--	--	--
Special 11/	(10/)	(10/)	--	--	--	--
Unspecified 12/						
Actual	(10/)	(10/)	(10/)	(10/)	--	--
Estimated	1,900	5,830	(10/)	(10/)	15	44
Total	40,800	173,000	2,370	7,270	15	44

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

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ No crushed stone produced in District 8.

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

4/ Less than 1/2 unit.

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

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

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

8/ Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

9/ Includes cement manufacture, flux stone, lime manufacture, and sulfur oxide removal.

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

11/ Includes asphalt fillers or extenders, other fillers or extenders, and whiting or whiting substitute.

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

TABLE 5  
TEXAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1997,  
BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate and concrete products	23,100	\$115,000	\$4.98
Plaster and gunit sands	395	2,010	5.08
Asphaltic concrete aggregates and other bituminous mixtures	1,660	9,810	5.90
Road base and coverings	1,820	6,390	3.52
Road stabilization (cement)	1,360	4,300	3.17
Road stabilization (lime)	6	11	1.83
Fill	5,540	10,900	1.97
Roofing granules	75	941	12.55
Filtration	66	1,090	16.55
Other miscellaneous uses	336	2,290	6.83
Unspecified: 2/			
Actual	9,250	47,400	5.13
Estimated	16,500	83,800	5.07
Total or average	60,100	284,000	4.72

1/ Data are rounded to three significant digits, except value per ton; may not add to totals shown.

2/ Includes reported and estimated production without a breakdown by end use.

TABLE 6  
TEXAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1997,  
BY USE AND DISTRICT 1/

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products 2/	888	5,420	W	W	W	W	W	W
Asphaltic concrete aggregates and road base materials 3/	1,200	7,480	--	--	W	W	21	139
Other miscellaneous uses 4/	166	615	W	W	--	--	W	W
Unspecified: 5/								
Actual	--	--	--	--	--	--	W	W
Estimated	1,210	5,270	10	68	173	835	1,520	8,760
Total	3,470	18,800	1,050	7,260	888	3,910	1,950	12,000
Use	District 5		District 6		District 7		District 8	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products 2/	5,950	34,300	W	W	1,830	8,600	10,400	42,200
Asphaltic concrete aggregates and road base materials 3/	319	1,380	W	W	413	1,740	2,480	7,290
Other miscellaneous uses 4/	1,460	4,670	W	W	1,090	3,120	W	W
Unspecified: 5/								
Actual	6,580	33,100	--	--	1,580	8,880	W	W
Estimated	2,930	14,000	751	4,300	1,320	5,090	5,220	25,400
Total	17,200	87,400	968	5,220	6,220	27,400	21,500	82,400
Use	District 9		Unspecified districts					
	Quantity	Value	Quantity	Value				
Concrete aggregate and concrete products 2/	W	W	--	--				
Asphaltic concrete aggregates and road base materials 3/	W	W	--	--				
Other miscellaneous uses 4/	--	--	--	--				
Unspecified: 5/								
Actual	--	--	750	3,480				
Estimated	3,400	20,100	--	--				
Total	6,060	36,200	750	3,480				

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

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes plaster and gunit sands.

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

4/ Includes fill, filtration, and roofing granules.

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