

# THE MINERAL INDUSTRY OF TEXAS

**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 Bureau of Economic Geology, The University of Texas at Austin, for collecting information on all nonfuel minerals.**

Texas rose in rank from sixth to fifth in the Nation in total nonfuel mineral production value<sup>1</sup> in 1996, according to the U.S. Geological Survey (USGS). The estimated value for 1996 was almost \$1.8 billion, a 6% increase from that of 1995. This followed an 9.1% increase from 1994 to 1995 (based on final 1995 data). The State accounted for more than 4.5% of the total U.S. nonfuel mineral production value.

More than 85% of the State's nonfuel mineral value came from the mining and processing of industrial minerals, especially (in descending order of value) portland cement, construction sand and gravel, crushed stone, lime, and salt. Substantial increases in value of the first three plus an increase in the value of magnesium metal accounted for most of the State's increase in total nonfuel mineral value in 1996. Construction sand and gravel, the mineral commodity with the largest change in value, increased 26%, or \$71 million. Crushed stone increased by more than \$25 million, portland cement by \$17 million, and magnesium metal, by more than \$16 million. The only significant decrease was Frasch sulfur, which had a \$16-million drop in value. Compared with 1995, the following nonfuel mineral values also increased: lime, masonry cement, crude gypsum, sodium sulfate, bentonite clays, ball clays, and magnesium compounds. Other values that decreased were those of salt, industrial sand and gravel, Grade-A helium, common clays, dimension stone, crude helium, talc and pyrophyllite, fuller's earth clays, and gemstones.

Based on USGS estimates of the quantities of minerals produced in the 50 States in 1996, Texas remained first in crushed stone and first of three magnesium metal-producing States; second in portland cement, construction sand and gravel, salt, and common clays; and second in each of two Frasch sulfur, two sodium sulfate, and three crude helium-producing States. The State continued to rank third in gypsum, ball clays, and third of five Grade-A helium-producing States; sixth in lime, bentonite, and magnesium compounds; and eighth in masonry cement. Texas dropped from sixth to seventh in the production of industrial sand and gravel and from seventh to eighth in dimension stone. In 1995, the State was second in zeolites; data were not yet available for 1996.

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 was among the top seven States that produced raw steel, with an estimated output of nearly 4.3 million metric tons (more than 4.7 million short tons), as reported by the American Iron and Steel Institute. The State ranked ninth in primary aluminum production.

The following narrative information was provided by the Texas Bureau of Economic Geology<sup>2</sup> (TBEG). The nonfuel mineral industry of Texas continued to grow during 1996. An increase in population and growth in industry helped to spur activity in mineral production by creating a demand for materials used in developing infrastructure. Aggregate and stone production significantly increased in response to a growing demand from new as well as continuing construction projects. The outlook, as projected by the TBEG, was one of continued population increase and commercial development which would result in increasing demand for development of the State's mineral resources.

Texas Employment Commission records showed increases in employment in construction and manufacturing related to mineral products during 1996. The construction job annual growth rate at the end of the third quarter was 4.4%. Manufacturing jobs related to mineral production such as stone, clay, glass products, concrete, and gypsum increased by about 4% compared to the same period in 1995. Texas Workforce Commission statistics indicated a 1-month gain of 700 jobs (0.5 % increase) at the beginning of the fourth quarter. This may indicate a change in the long-term downward trend in mining employment. Overall employment in the mining industry during the first three quarters of 1996 decreased by about 1.5%.

No significant change occurred in overall exploration for nonfuel minerals in Texas during 1996. The TBEG received several inquiries about possible sources of clays, industrial sands, sand and gravel materials, and crushed stone, but no inquiries about sources of cement materials, lime, or gypsum. Many sources of sand and gravel,

especially large deposits, are being depleted, and producers are seeking additional resources. Sources of limestone-based materials are generally plentiful in Texas.

Trinity Materials Inc., based in Beaumont, acquired assets of Brazco Point during 1996. The acquisition includes sand and gravel and base operations in Cleburne and rail yards in Fort Worth and Alvarado.

Titan Resources Inc. acquired a commercial quarry in southeast Houston. This is Titan's entry into the sand and gravel business. The commercial value of all materials in place were valued at more than \$40 million

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. For some 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. 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>

<sup>2</sup>L. Edwin Garner, Research Associate, authored the text of mineral industry information submitted by the Bureau of Economic Geology of the University of Texas at Austin..

<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

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1994		1995		1996 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
<b>Cement:</b>						
Masonry	258	18,200	202	17,600	228	19,900
Portland	8,620	456,000	8,090	499,000	8,370	516,000
Clays 3/	2,190	13,700	2,450	26,000	2,490	18,000
Gemstones	NA	448	NA	353	NA	W
Gypsum (crude)	1,870	10,100	1,880	16,200	1,870	16,600
Helium (crude) million cubic meters	7	7,050	5	4,730	W	W
Lime	1,210	76,200	1,370	85,800	1,410	88,100
Salt	8,760	76,500	9,110	85,000	8,970	76,100
<b>Sand and gravel:</b>						
Construction	56,700	242,000	61,100	271,000	72,000	342,000
Industrial	1,570	37,900	1,600	40,300	1,570	39,300
<b>Stone:</b>						
Crushed	76,100	300,000	81,100	310,000	86,000	335,000
Dimension metric tons	W	W	54,000	13,300	51,800	12,600
Talc and pyrophyllite do.	225,000	5,860	294,000	5,840	236,000	4,580
Combined value of clays [ball (1994), bentonite, fuller's earth, kaolin (1994)], helium [crude (1996), Grade-A ], iron ore [usable (1994)], magnesium compounds, magnesium metal, sodium sulfate (natural), stone [dimension granite and limestone (1994)], sulfur (Frasch), and values indicated by symbol W	XX	295,000	XX	301,000	XX	314,000
<b>Total</b>	<b>XX</b>	<b>1,540,000</b>	<b>XX</b>	<b>1,680,000</b>	<b>XX</b>	<b>1,780,000</b>

p/ Preliminary. NA Not available. 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.

3/ Excludes certain clays; kind and value included with "Combined value" data.

TABLE 2  
TEXAS: CRUSHED STONE 1/ SOLD OR USED BY PRODUCERS  
IN 1995, BY USE 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
<b>Coarse aggregate (+1 1/2 inch):</b>			
Riprap and jetty stone	572	\$3,700	\$646
Filter stone	221	1,440	6.50
Other coarse aggregate 3/	254	951	3.74
<b>Coarse aggregate, graded:</b>			
Concrete aggregate, coarse	13,600	64,300	4.71
Bituminous aggregate, coarse	7,930	37,200	4.69
Bituminous surface-treatment aggregate	1,280	8,840	6.91
Railroad ballast	225	1,190	5.28
Other graded coarse aggregate	W	W	2.77
<b>Fine aggregate (-3/8 inch):</b>			
Stone sand, concrete	2,300	9,990	4.34
Stone sand, bituminous mix or seal	1,840	5,750	3.12
Screening, undesignated	2,180	7,660	3.52
Other fine aggregate	48	165	3.44
<b>Coarse and fine aggregates:</b>			
Graded road base or subbase	22,300	65,200	2.93
Unpaved road surfacing	260	764	2.94
Terrazzo and exposed aggregate	W	W	12.08
Crusher run or fill or waste	1,050	2,500	2.39
Other coarse and fine aggregates	W	W	4.70
Other construction materials 4/	614	3,490	5.69
<b>Agricultural:</b>			
Agricultural limestone	302	1,140	3.77
Poultry grit and mineral food	100	776	7.76
Other agricultural uses	(5/)	(5/)	10.89
<b>Chemical and metallurgical:</b>			
Cement manufacture	10,400	28,200	2.71
Lime manufacture	957	5,360	5.60
Chemical stone	74	422	5.70
Glass manufacture	(5/)	(5/)	6.50
Sulfur oxide removal	572	2,320	4.05
<b>Special:</b>			
Asphalt fillers or extenders	(5/)	(5/)	8.65
Other fillers or extenders	(5/)	(5/)	36.30
Other specified uses not listed	(5/)	(5/)	8.00
<b>Unspecified: 6/</b>			
Actual	909	2,390	2.63
Estimated	11,900	31,700	2.66
Total	81,100	310,000	3.82

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

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; may not add to totals shown.

3/ Includes macadam.

4/ Includes waste material.

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

6/ Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3  
TEXAS: CRUSHED STONE SOLD OR USED, BY KIND 1/

Kind	1994				1995			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	111 r/	72,700 r/	\$285,000	\$3.93 r/	110	76,100	\$291,000	\$3.82
Dolomite	1	W	W	2.84	1	W	W	2.83
Marble	20	W	W	W	20	W	W	W
Calcareous marl	2	W	W	1.76	2	W	W	2.13
Granite	14	4	W	W	14	W	W	W
Traprock	2 r/	W	W	6.95 r/	2	W	W	4.20
Sandstone	7 r/	805 r/	5,690 r/	7.07 r/	6	1,100	W	W
Volcanic cinder and scoria	1	W	W	5.47	1	W	W	5.39
Miscellaneous stone	4 r/	514 r/	1,960 r/	3.81 r/	4	986	2,410	2.44
Total	XX	76,100	300,000	3.95	XX	81,100	310,000	3.82

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

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

TABLE 4  
TEXAS: CRUSHED STONE 1/ SOLD OR USED BY PRODUCERS IN 1995,  
BY USE AND DISTRICT 2/

(Thousand metric tons and thousand dollars)

Use	District 1		District 4		District 5		District 7	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch) 3/	(4/)	3	283	1,420	221	1,560	542	3,100
Coarse aggregate, graded 5/	59	392	1,830	10,900	9,250	47,500	12,000	52,700
Fine aggregate (-3/8 inch) 6/	10	11	394	1,940	1,880	5,670	4,080	15,900
Coarse and fine aggregate 7/	88	287	1,660	5,440	4,490	18,600	15,800	41,800
Agricultural 8/	--	--	--	--	(10/)	(10/)	(10/)	(10/)
Chemical and metallurgical 9/	--	--	(10/)	(10/)	(10/)	(10/)	7,450	22,700
Special 11/	--	--	--	--	(10/)	(10/)	(10/)	(10/)
Unspecified: 12/								
Actual	--	--	(10/)	(10/)	(10/)	(10/)	--	--
Estimated	1,080	2,830	2,110	5,380	7,350	19,700	969	2,540
Total	1,230	3,520	7,630	28,600	28,200	114,000	41,400	157,000
					Unspecified within all districts			
					Quantity	Value		
Construction aggregates:								
Coarse aggregate (+1 1/2 inch) 3/	--	--	--	--	--	--	--	--
Coarse aggregate, graded 5/	--	--	--	--	8	66	--	--
Fine aggregate (-3/8 inch) 6/	--	--	--	--	5	42	--	--
Coarse and fine aggregate 7/	--	--	1,990	5,230	189	520	--	--
Agricultural 8/	--	--	--	--	--	--	--	--
Chemical and metallurgical 9/	--	--	--	--	--	--	--	--
Special 11/	--	--	--	--	--	--	--	--
Unspecified: 12/								
Actual	--	--	--	--	--	--	--	--
Estimated	367	966	49	228	--	--	--	--
Total	367	966	2,040	5,450	202	628	--	--

1/ Production reported in District 2 and 3 was included with "District 4"; District 6 was included with "District 5" to avoid disclosing company proprietary data.

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

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, other graded coarse aggregate, other construction materials, and waste material.

6/ Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesigned), 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, chemical stone for alkali works, glass manufacture, 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 other specified uses not listed.

12/ Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5  
 TEXAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1995,  
 BY MAJOR USE CATEGORY 1/

Use	Quantity		Value per ton
	(thousand metric tons)	Value (thousands)	
Concrete aggregate (including concrete sand)	20,700	\$102,000	\$4.94
Plaster and gunite sands	503	2,450	4.87
Concrete products (blocks, bricks, pipe, decorative, etc.)	201	693	3.45
Asphaltic concrete aggregates and other bituminous mixtures	1,820	9,320	5.11
Road base and coverings 2/	2,960	11,400	3.84
Fill	6,080	11,900	1.96
Other 3/	530	942	1.78
Unspecified: 4/			
Actual	11,100	62,500	5.62
Estimated	17,200	69,500	4.05
Total or average	61,100	271,000	4.43

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

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

3/ Includes roofing granules.

4/ Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6  
 TEXAS: CONSTRUCTION SAND AND GRAVEL 1/ SOLD OR USED IN 1995,  
 BY USE AND DISTRICT 2/

(Thousand metric tons and thousand dollars)

Use	District 1		District 3		District 4		District 5	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products 3/	761	4,960	(4/)	(4/)	346	2,410	7,650	43,500
Asphaltic concrete aggregates and road base materials 5/	1,020	5,410	(4/)	(4/)	69	254	3,020	7,730
Other miscellaneous uses 6/	3	18	--	--	8	66	--	--
Unspecified: 7/								
Actual	58	282	32	192	663	4,260	4,990	30,600
Estimated	1,110	4,690	355	1,730	1,670	9,790	2,990	10,800
Total	2,950	15,400	1,880	9,620	2,760	16,800	18,700	92,600
Use	District 6		District 7		District 8		District 9	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products 3/	(4/)	(4/)	2,040	8,140	7,430	28,500	1,610	9,690
Asphaltic concrete aggregates and road base materials 5/	(4/)	(4/)	1,530	2,610	3,990	10,100	960 8/	5,290
Other miscellaneous uses 6/	--	--	--	--	519	858	--	--
Unspecified: 7/								
Actual	--	--	1,860	9,490	2,610	12,000	902 8/	5,680
Estimated	648	3,050	1,990	7,790	7,320	26,800	1,070	4,910
Total	1,010	4,710	7,420	28,000	21,900	78,200	4,550 8/	25,600

1/ Production reported in District 2 was included with "District 3" to avoid disclosing company proprietary data.

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

3/ Includes plaster and gunite sands.

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

5/ Includes fill and road and other stabilization (cement and lime).

6/ Includes roofing granules.

7/ Includes production reported without a breakdown by end use and estimates for nonrespondents.

8/ Includes unspecified within all districts.