

THE MINERAL INDUSTRY OF CALIFORNIA

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 California Department of Conservation, Division of Mines and Geology, for collecting information on all nonfuel minerals.

In 1994, for the third consecutive year, California was the third leading State in the Nation in total nonfuel mineral value,¹ according to the U.S. Bureau of Mines. The estimated value for 1994 was \$2.5 billion, a 2% increase over that of 1993. This followed a 3% increase in 1993 over that of 1992. The State accounted for more than 7% of the U.S. total. Among a significantly diverse selection of minerals produced in California, almost 85% of the State's nonfuel mineral value came from industrial minerals, especially portland cement, construction sand and gravel, boron, dimension stone, and diatomite. Most of the

remaining 15% resulted from gold, followed by silver, tungsten, and copper. In estimated mineral production for 1994, California remained the Nation's only producer of boron and tungsten; first in the production of construction sand and gravel, portland cement, rare-earth concentrates, and diatomite; first of two States that produced natural sodium sulfate and asbestos; second in gold and magnesium compounds; second of two States producing soda ash and titanium (ilmenite); third in perlite, potash, and pumice; fourth in bentonite clay, feldspar, and industrial sand and gravel; and sixth in fuller's earth clays,

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN CALIFORNIA¹

Mineral	1992		1993		1994 ^P	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Asbestos metric tons	10,998	\$4,452	10,043	\$4,426	8,530	\$4,000
Boron minerals do.	1,008,889	338,700	1,054,615	372,839	560,000	370,000
Cement (portland) thousand metric tons	7,289	428,016	8,511	468,349	10,100	555,000
Clays ² do.	1,906	26,173	1,961	26,482	1,990	29,900
Gemstones	NA	9,916	NA	673	NA	17,700
Gold ³ kilograms	33,335	369,723	35,763	414,977	⁴ 33,000	⁴ 383,000
Lime thousand metric tons	254	18,072	193	14,751	187	14,100
Mercury metric tons	(⁵)	(⁵)	W	W	W	W
Rare-earth metal concentrates do.	20,699	W	17,754	W	W	W
Sand and gravel:						
Construction thousand metric tons	102,410	522,108	⁶ 96,300	⁶ 475,700	93,000	465,000
Industrial do.	⁷ 1,915	⁷ 42,512	1,797	41,668	W	W
Silver ³ metric tons	18	2,259	14	2,002	12	1,660
Stone:						
Crushed thousand metric tons	⁸ 37,013	⁸ 198,300	38,167	249,740	⁸ 40,000	⁸ 266,000
Dimension metric tons	⁸ 21,130	⁸ 4,148	29,082	6,299	⁸ 29,000	⁸ 6,560
Combined value of calcium chloride ⁶ (1992), cement (masonry), clays (fuller's earth), copper (1994), diatomite, feldspar, gypsum (crude), iron ore (usable), magnesium compounds, molybdenum (1992), perlite, potash, pumice, salt, silver (1991), soda ash, sodium sulfate (natural), talc and pyrophyllite, titanium (ilmenite), tungsten, and values indicated by symbol W						
	XX	402,975	XX	362,328	XX	400,000
Total	XX	² 2,367,354	XX	2,440,234	XX	⁷ 2,500,000

¹Estimated. ^PPreliminary. ^RRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

²Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

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

⁴Recoverable content of ores, etc.

⁵Placer canvassing discontinued beginning 1994.

⁶Less than 1/2 unit.

⁷Calcium chloride canvassing discontinued beginning 1993.

⁸Data do not add to total shown because of independent rounding.

kaolin clays, gypsum, talc, and pyrophyllite. The State dropped from fifth to sixth in the production of common clays. Compared with 1993, the value of the following nonfuel minerals increased: crushed stone, diatomite, rare-earth concentrates, fuller's earth clays, sodium sulfate, common clays, gypsum, dimension stone, pumice, gemstones, tungsten, and copper. The value of the following decreased: portland cement, construction and industrial sand and gravel, gold, boron, soda ash, salt, lime, potash, magnesium compounds, asbestos, feldspar, masonry cement, silver, and perlite.

Permits for new and expanded sand and gravel operations were granted by several city and county municipal officials, according to the California Department of Conservation, Division of Mines and Geology. The Alameda County Board of Supervisors approved a surface mining permit for the Mission Valley Rock expansion proposal making available an additional 24.5 million metric tons (27 million short tons) of sand and gravel to the San Francisco Bay area. The U.S. Bureau of Land Management granted a permit for in-situ solution mining of borates at the Ft. Cady Minerals Corp.'s Cady Mine in San

Bernardino County. Homestake's McLaughlin Mine in Lake, Napa, and Yolo Counties continued as the leading gold producer in California, followed closely by the Santa Fe Pacific Gold Corp.'s Mesquite Mine in Imperial County. Two major gold mines in northern California's Mother Lode District closed in 1994. In July, following 8 consecutive years of operation, the Sonora Mining Corp. closed its Jamestown Mine in Tuolumne County as a result of falling gold prices and for other economic reasons. Meridian Gold Co.'s Royal Mountain King Mine in Calaveras County also closed in May after 6 years of operation. Marine Magnesium Co.'s dolomite quarry in Tuolumne County ceased operation in 1994. The passage of the California Desert Protection Act (Public Law 103-433) by Congress closed more than 2.6 million hectares—about 6.5 million acres—of public land to mining and mineral exploration in Imperial, Inyo, Kern, Riverside, San Bernardino, and San Diego Counties.

³The term value means the total monetary value as represented by either mine shipments, mineral commodity sales, or marketable production as is applicable to the individual mineral commodities.

TABLE 2
CALIFORNIA: CRUSHED STONE¹ SOLD OR USED BY PRODUCERS IN 1993, BY USE

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	865	\$8,502	\$9.83
Filter stone	220	1,155	5.25
Other coarse aggregate	255	1,163	4.56
Coarse aggregate, graded:			
Concrete aggregate, coarse	1,343	10,141	7.55
Bituminous aggregate, coarse	1,806	11,481	6.36
Bituminous surface-treatment aggregate	448	6,140	13.71
Railroad ballast	1,260	9,143	7.26
Other graded coarse aggregate	409	2,580	6.31
Fine aggregate (-3/8 inch):			
Stone sand, concrete	343	3,082	8.99
Stone sand, bituminous mix or seal	759	4,629	6.10
Screening, undesignated	660	7,504	11.37
Coarse and fine aggregates:			
Graded road base or subbase	5,170	31,213	6.04
Unpaved road surfacing	198	1,149	5.80
Terrazzo and exposed aggregates	91	982	10.79
Crusher run or fill or waste	1,313	4,573	3.48
Other coarse and fine aggregates	212	974	4.59
Other construction materials ²	793	5,855	7.38
Agricultural: Agricultural limestone ³	50	685	13.70
Chemical and metallurgical:			
Cement manufacture	13,097	48,130	3.67
Flux stone	W	W	16.69
Chemical stone	W	W	16.53
Glass manufacture	106	1,919	18.10
Sulfur oxide removal	W	W	16.53
Special:			
Asphalt fillers or extenders	W	W	6.70
Whiting or whiting substitute	W	W	28.10
Other fillers or extenders	157	897	5.71
Flour (slate)	W	W	49.43
Other specified uses not listed	2,066	53,234	25.77
Unspecified:⁴			
Actual	2,286	11,374	4.98
Estimated	4,262	23,238	5.45
Total ⁵	38,167	249,740	6.54
Total ^{6 7}	42,072	249,740	5.94

W Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."

¹Includes dolomite, granite, limestone, marble, miscellaneous stone, quartzite, sandstone, shell, slate, traprock, and volcanic cinder and scoria.

²Includes macadam.

³Includes poultry grit and mineral food.

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

⁵Data may not add to totals shown because of independent rounding.

⁶One short ton is equal to 907 kilograms or 2,000 pounds. To convert metric tons to short tons, divide metric tons by 0.907185.

⁷Total shown in thousand short tons and thousand dollars.

TABLE 3
CALIFORNIA: CRUSHED STONE SOLD OR USED, BY KIND

Kind	1991				1993			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	'27	'17,687	'\$81,559	'\$4.61	35	17,944	\$119,247	\$6.65
Dolomite	3	119	1,117	9.39	4	164	1,438	8.77
Marble	3	529	2,931	5.54	3	467	2,626	5.62
Shell	'2	W	W	'6.83	2	W	W	6.96
Granite	'128	'7,471	'36,333	'4.86	112	6,695	43,737	6.53
Traprock	'38	'8,652	'64,214	'7.42	39	7,567	54,206	7.16
Sandstone	'9	'1,436	'5,548	'3.86	8	620	2,946	4.75
Quartzite	2	W	W	2.91	2	W	W	8.00
Slate	'1	W	W	W	3	299	2,376	7.95
Volcanic cinder and scoria	'29	'480	'2,554	'5.32	38	356	1,762	4.95
Miscellaneous stone	'29	'3,192	'15,363	'4.81	53	3,916	20,301	5.18
Total ¹	XX	'41,546	'216,052	5.20	XX	38,167	249,740	6.54
Total ^{2,3}	XX	'45,797	'216,052	4.72	XX	42,072	249,740	5.94

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

¹Data may not add to totals shown because of independent rounding.

²One short ton is equal to 907 kilograms or 2,000 pounds. To convert metric tons to short tons, divide metric tons by 0.907185.

³Total shown in thousand short tons and thousand dollars.

TABLE 4
CALIFORNIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1993, BY USE AND DISTRICT

(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) ¹	30	197	W	W	329	3,344	W	W
Coarse aggregate, graded ²	—	—	W	W	W	W	W	W
Fine aggregate (-3/8 inch) ³	—	—	12	W	W	W	W	W
Coarse and fine aggregate ⁴	(⁵)	211	195	W	1,212	7,310	W	W
Other construction materials	(⁵)	30	135	1,653	1,168	7,130	1,414	11,125
Agricultural ⁶	—	—	1,944	(⁵)	—	—	—	—
Chemical and metallurgical ⁷	—	—	(⁵)	(⁵)	—	—	—	—
Special ⁹	—	—	—	—	—	—	—	—
Other miscellaneous uses	(⁵)	(¹⁰)	(⁵)	(⁵)	(⁵)	(⁵)	—	—
Unspecified: ¹¹								
Actual	—	—	39	96	—	—	45	271
Estimated	264	1,548	52	296	(⁵)	(⁵)	—	—
Total ¹²	330	1,987	1,061	5,678	3,185	20,451	1,459	11,395
Total ^{13,14}	364	1,987	1,170	5,678	3,511	20,451	1,608	11,395

See footnotes at end of table.

TABLE 4—Continued
CALIFORNIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1993, BY USE AND DISTRICT

(Thousand metric tons and thousand dollars)

Use	District 5		District 6		District 7		District 8	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch) ¹	W	W	W	W	W	W	(¹⁰)	(¹⁰)
Coarse aggregate, graded ²	W	W	884	8,334	W	W	—	—
Fine aggregate (-3/8 inch) ³	W	W	W	W	W	W	—	—
Coarse and fine aggregate ⁴	W	W	2,214	11,538	1,538	8,215	(¹⁰)	(¹⁰)
Other construction materials	581	3,313	322	2,717	2,524	16,226	—	—
Agricultural ⁶	—	—	(⁵)	(⁵)	—	—	—	—
Chemical and metallurgical ⁷	(⁸)	(⁸)	—	—	(⁸)	(⁸)	(⁵)	(⁵)
Special ⁹	(⁸)	(⁸)	(⁵)	(⁵)	(⁸)	(⁸)	—	—
Other miscellaneous uses	93	2,108	—	—	2,481	10,449	(⁵)	(⁵)
Unspecified: ¹¹								
Actual	254	1,453	(¹⁰)	(¹⁰)	—	—	—	—
Estimated	869	6,697	417	1,702	185	1,059	(⁵)	(⁵)
Total ¹²	1,796	13,573	3,971	24,700	6,728	35,948	2,375	11,078
Total ^{13 14}	1,980	13,573	4,377	24,700	7,416	35,948	2,618	11,078
	District 9		District 10		District 11		District 12	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch) ¹	527	3,198	(¹⁰)	(¹⁰)	138	(⁵)	W	W
Coarse aggregate, graded ²	526	4,375	—	—	727	5,053	W	W
Fine aggregate (-3/8 inch) ³	W	W	—	—	23	(⁵)	W	W
Coarse and fine aggregate ⁴	59	164	13	51	117	413	W	W
Other construction materials	475	7,454	—	—	—	—	1,271	7,213
Agricultural ⁶	(⁸)	(⁸)	(⁵)	(⁵)	—	—	—	—
Chemical and metallurgical ⁷	8,039	26,246	(⁵)	(⁵)	—	—	—	—
Special ⁹	(⁸)	(⁸)	(⁵)	(⁵)	—	—	—	—
Other miscellaneous uses	1,821	50,415	—	—	(¹⁰)	(¹⁰)	—	—
Unspecified: ¹¹								
Actual	836	5,345	—	—	1,112	4,208	—	—
Estimated	912	4,884	(⁵)	(⁵)	28	160	458	2,618
Total ¹²	13,194	102,082	195	2,245	2,144	10,772	1,729	9,831
Total ^{13 14}	14,544	102,082	215	2,245	2,363	10,772	1,906	9,831

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

¹Includes filter stone, riprap and jetty stone, and other coarse aggregate.

²Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.

³Includes stone sand (concrete), stone sand (bituminous mix and seal), and screening (undesignated).

⁴Includes graded road base or subbase, unpaved road surfacing, terrazzo and exposed aggregate, crusher run (select material or fill), and other coarse and fine aggregates.

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

⁶Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

⁷Includes cement manufacture, chemical stone for alkali works, flux stone, glass manufacture, and sulfur oxide removal.

⁸Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."

⁹Includes asphalt fillers or extenders, flour (slate), whitening or whitening substitute, other fillers or extenders, and other specified uses not listed.

¹⁰Less than 1/2 unit.

¹¹Includes production reported without a breakdown by use and estimates for nonrespondents.

¹²Data may not add to totals shown because of independent rounding.

¹³One short ton is equal to 907 kilograms or 2,000 pounds. To convert metric tons to short tons, divide metric tons by 0.907185.

¹⁴Total shown in thousand short tons and thousand dollars.