### MINING AND QUARRYING TRENDS

### By Mary E. Ewell

Domestic survey data were prepared by the author and each of the statistical assistants who has responsibility for the mineral commodities indicated.

The mining and quarrying trends shown in this report were calculated from nonfuel mineral data reported to the U.S. Geological Survey (USGS) by mining and quarrying companies operating in the United States. The data for 2003 were reported on the "Mine, Development, and Mineral Exploration Supplement," a statistical survey conducted by the USGS, and on the production surveys for some more widely produced nonfuel mineral commodities, such as sand and gravel, for which the available data are extracted from computer files. Additional data for 2003 were derived from annual USGS production and consumption surveys of nonfuel mineral producers; these surveys covered 58 nonfuel mineral commodities produced in the United States. Nonfuel minerals exclude coal, coke, petroleum, and related products.

As listed in this report, mining and quarrying data for 2003 include the annual data for construction sand and gravel and crushed and dimension stone. From 1981 to 1993, these mineral commodities were surveyed biennially and appeared alternately in this report. The inclusion of both sets of data in this report results in essentially a complete coverage of nonfuel mineral production in the United States. Comparisons of the 1994 to 2003 data with previously reported annual data, however, are not possible.

The data in the following tables are reported according to the primary product of a mine or operation. The primary product is usually determined by the product with the highest total value for the year. In some instances, the values of two products at the same operation are so similar that the products are coproducts. To account for the data without double counting, however, a product of lesser value is considered to be a byproduct.

Total domestic mining of nonfuel mineral materials amounted to 5.5 billion metric tons (Gt) in 2003, about the same level as that of 2002. These materials included 4.1 Gt of crude ore mined or quarried and 1.4 Gt of mine ore and waste from development operations. Of the nonfuel mineral materials mined, 62% was for the production of industrial minerals, and 38% was for the production of metals. Overall, 98% of nonfuel minerals was mined and quarried at surface level, and 2% was mined underground.

Total surface mining and quarrying for industrial minerals amounted to 3.3 Gt, remaining essentially the same as that of 2002. Crude ore mined at these surface operations was 2.9 Gt, and 416 million metric tons (Mt) was ore and waste from development operations. Underground mining for industrial minerals amounted to only 107 Mt, nearly all of which was crude ore.

Total surface mining for metal ores came to 2.1 Gt, about the same level as in 2002. Of the 2.1 Gt, about 1.0 Gt was crude ore mined, and 1.0 Gt was ore and waste from development operations. Underground mining of metal ores amounted to only 17 Mt, of which 83% was crude ore.

The major States in which mining for nonfuel minerals took place, in order of total material handled, were Nevada, Arizona, Florida, California, Minnesota, Texas, Michigan, Utah, Pennsylvania, and Ohio. These 10 States accounted for about 63% of the tonnage of nonfuel minerals mined in the United States. Virtually all nonfuel mineral production in these States was from surface operations.

 ${\bf TABLE~1}$  MATERIAL HANDLED AT SURFACE AND UNDERGROUND MINES IN THE UNITED STATES, BY  ${\bf TYPE}^1$ 

#### (Million metric tons)

	S	Surface <sup>2</sup> Underground <sup>3</sup>			A	All mines			
Type of ore and year	Crude ore	Waste <sup>4</sup>	Total	Crude ore	Waste <sup>4</sup>	Total	Crude ore	Waste <sup>4</sup>	Total
Metals:									
1999	1,060	1,050	2,110	26	2	28 r	1,090 r	1,050	2,140 r
2000	1,120 <sup>r</sup>	1,020	2,130	32	1	33	1,150 <sup>r</sup>	1,020 r	2,170 r
2001	1,080 <sup>r</sup>	1,120	2,190 r	17 <sup>r</sup>	3	20 r	1,090 <sup>r</sup>	1,120 r	2,210 r
2002	1,050 <sup>r</sup>	1,020	2,070 r	15 <sup>r</sup>	3 r	18 <sup>r</sup>	1,070 <sup>r</sup>	1,020 r	2,090
2003	1,040	1,030	2,070	14	3	17	1,050	1,030	2,080
Industrial minerals:									
1999	2,790	382	3,170	106	(5)	106	2,890	383	3,280
2000	2,780	381 <sup>r</sup>	3,160 r	110 <sup>r</sup>	(5)	110 <sup>r</sup>	2,890	381 <sup>r</sup>	3,270 r
2001	2,840	358 <sup>r</sup>	3,200 r	114 <sup>r</sup>	(5)	114 <sup>r</sup>	2,960 <sup>r</sup>	358 <sup>r</sup>	3,310 <sup>r</sup>
2002	2,850	442 <sup>r</sup>	3,290 r	108 <sup>r</sup>	(5)	108 <sup>r</sup>	2,960	442 <sup>r</sup>	3,400 r
2003	2,900	416	3,310	107	(5)	107	3,000	416	3,420

See footnotes at end of table.

 ${\bf TABLE~1--Continued}\\ {\bf MATERIAL~HANDLED~AT~SURFACE~AND~UNDERGROUND~MINES~IN~THE~UNITED~STATES,~BY~TYPE$^{1}}$ 

### (Million metric tons)

	Surface <sup>2</sup>			Un	derground3	3	All mines		
Type of ore and year	Crude ore	Waste <sup>4</sup>	Total	Crude ore	Waste <sup>4</sup>	Total	Crude ore	Waste <sup>4</sup>	Total
All mineral commodities:									
1999	3,850 r	1,430	5,280	132	2	134	3,980	1,430	5,410
2000 <sup>r</sup>	3,900	1,400	5,300	142	1	143	4,040	1,400	5,440
2001 <sup>r</sup>	3,920	1,480	5,390	131	3	134	4,050	1,480	5,530
2002	3,890	1,460 <sup>r</sup>	5,350 <sup>r</sup>	123 <sup>r</sup>	4	127 <sup>r</sup>	4,010	1,470 <sup>r</sup>	5,480 <sup>r</sup>
2003	3,930	1,440	5,380	121	3	124	4,050	1,450	5,500

Revised.

 ${\it TABLE~2}\\ {\it MATERIAL~HANDLED~AT~SURFACE~AND~UNDERGROUND~MINES~IN~THE~UNITED~STATES~IN~2003,~BY~COMMODITY~AND~STATE^{1}}$ 

			Surface <sup>2</sup>			Underground	l <sup>3</sup>		All mines	
	Number	Crude ore	Waste <sup>5</sup>	Total	Crude ore	Waste <sup>5</sup>	Total	Crude ore	Waste <sup>5</sup>	Total
	of	(thousand	(thousand	(thousand	(thousand	(thousand	(thousand	(thousand	(thousand	(thousand
Commodity or State	mines <sup>4</sup>	metric tons)	metric tons)	metric tons)	metric tons)	metric tons)	metric tons)	metric tons)	metric tons)	metric tons)
Metal ore:										
Gold	37	193,000	753,000	946,000	3,570	1,620	5,200	197,000	755,000	951,000
Iron	9	153,000	109,000	262,000				153,000	109,000	262,000
Zinc	7	W	W	W	2,090	W	2,090 6	2,090 7	W	2,090 6,
Other <sup>8</sup>	35	691,000	166,000	858,000	8,460	1,320	9,780	700,000	168,000	867,000
Total	88	1,040,000	1,030,000	2,070,000	14,100	2,940	17,100	1,050,000	1,030,000	2,080,000
Industrial minerals:										
Barite	5	708	W	708 <sup>6</sup>				708	W	708 <sup>6</sup>
Clays	648	39,600	34,500	74,100	W	(9)	$\mathbf{W}$	39,600 10	34,500 10	74,100 10
Diatomite	12	1,260	3,030	4,300				1,270	3,030	4,300
Feldspar <sup>11</sup>	9	1,620	W	1,620 6				1,620	W	1,620 6
Gypsum	36	12,300	3,630	15,900	1,730		1,730	14,000	3,630	17,600
Phosphate rock	14	153,000	W	153,000 <sup>6</sup>				153,000	W	153,000 6
Pumice <sup>12</sup>	18	870	544	1,410				870	544	1,410
Salt	66	6,900		6,900	30,800		30,800	37,700		37,700
Sand and gravel:										
Construction	10,126	1,160,000		1,160,000				1,160,000		1,160,000
Industrial	137	27,000		27,000	W		W	27,000 10		27,000 10
Soda ash	7				10,600		10,600	10,600		10,600
Stone:										
Crushed	3,223	1,480,000	112,000	1,590,000	50,600	350	50,900	1,530,000	112,000	1,640,000
Dimension	166	1,310	645	1,950	W		W	1,310 10	645	1,950 10
Talc and pyrophyllite	14	683	2,340	3,030	W		W	683 <sup>10</sup>	2,340	3,030 10
Tripoli	6	73		73				73		73
Other <sup>13</sup>	146	8,350	259,000	267,000	12,800		12,800	21,200	259,000	280,000
Total	14,633	2,900,000	416,000	3,310,000	107,000	350	107,000	3,000,000	416,000	3,420,000
Grand total	14,721	3,930,000	1,440,000	5,380,000	121,000	3,290	124,000	4,050,000	1,450,000	5,500,000
State:										
Alabama	185	65,800	5,940	71,800	W	W	W	65,800 10		71,800 10
Alaska	211	44,900	28,700	73,600	W	W	W	44,900 10	28,700 10	73,600 10
Arizona	416	W	W	W	W	W	W	W	W	W
Arkansas	158	41,800	5,650	47,500	W		W	41,800 10	5,650	47,500 10
California	874	219,000	74,000	293,000	W	W	W	219,000 10	74,000 10	
Colorado	396	63,200	33,000	96,100	W	W	W	63,200 10	33,000 10	96,100 10
Connecticut	98	18,600	877	19,500				18,600	877	19,500
Delaware	11	2,560		2,560				2,560		2,560
Florida	185	269,000	W	269,000 <sup>6</sup>				269,000	W	269,000 <sup>6</sup>

See footnotes at end of table.

<sup>&</sup>lt;sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>&</sup>lt;sup>2</sup>Includes materials from wells, ponds, and pumping operations.

<sup>&</sup>lt;sup>3</sup>Includes solution mining.

<sup>&</sup>lt;sup>4</sup>Includes ore and waste from development operations.

<sup>&</sup>lt;sup>5</sup>Less than 1/2 unit.

 ${\it TABLE 2--Continued}\\ {\it MATERIAL HANDLED AT SURFACE AND UNDERGROUND MINES IN THE UNITED STATES IN 2003, BY COMMODITY AND STATE $^1$}$ 

			Surface <sup>2</sup>			Underground	13		All mines	
	Number	Crude ore	Waste <sup>5</sup>	Total	Crude ore	Waste <sup>5</sup>	Total	Crude ore	Waste <sup>5</sup>	Total
	of	(thousand	(thousand	(thousand	(thousand	(thousand	(thousand	(thousand	(thousand	(thousand
Commodity or State	mines <sup>4</sup>	metric tons)	metric tons)	metric tons)	metric tons)	metric tons)	metric tons)	metric tons)	metric tons)	metric tons)
StateContinued:										
Georgia	243	90,900	14,300	105,000	1,220	9	1,230	92,100	14,300	106,000
Hawaii	28	6,500	455	6,950				6,500	455	6,950
Idaho	382	29,600	W	29,600 6	W	W	W	29,600 10	W	29,600 6,10
Illinois	294	110,000	5,940	116,000	4,020	28	4,050	114,000	5,970	120,000
Indiana	272	79,500	4,120	83,600	4,020	24	4,050	83,500	4,140	87,600
Iowa	412	43,600	2,640	46,200	6,820	41	6,860	50,400	2,680	53,100
Kansas	384	32,100	2,150	34,200	2,940	4	2,950	35,000	2,150	37,200
Kentucky	148	46,400	3,820	50,200	18,100	126	18,200	64,500	3,950	68,400
Louisiana	156	31,500	583	32,100	14,100		14,100	45,700	714	46,400
Maine	176	13,800	259	14,100	·		·	13,800	259	14,100
Maryland	91	41,800	2,610	44,400	W	W	W	41,800 10	2,610 10	
Massachusetts	140	25,700	1,080	26,800				25,700	1,080	26,800
Michigan	568	144,000	W	144,000 <sup>6</sup>	1,910		1,910	146,000	W	146,000 <sup>6</sup>
Minnesota	586	174,000	71,000	245,000				174,000	71,000	245,000
Mississippi	121	18,400	913	19,300	W	W	W	18,400 <sup>10</sup>		
Missouri	330	79,600	6,830	86,400	9,200	35	9,230	88,800	7,050	95,900
Montana	262	25,700	W	25,700 <sup>6</sup>	1,700	W	1,700 <sup>6</sup>	27,400	W	27,400 <sup>6</sup>
Nebraska	175	20,400	672	21,100	W		W	20,400 10	672	21,100 10
Nevada	846	416,000	584,000	1,000,000	W	W	W	416,000 10		1,000,000 10
New Hampshire	99	12,600	345	12,900				12,600	345	12,900
New Jersey	96	40,100	1,700	41,800				40,100	1,700	41,800
New Mexico	538	W	W	W	W	W	W	W	W	W
New York	813	85,000	5,220	90,300	3,130		3,130	88,200	5,570	93,700
North Carolina	266	88,200	7,310	95,500				88,200	7,310	95,500
North Dakota	174	13,600	W	13,600 <sup>6</sup>				13,600	W	13,600 <sup>6</sup>
Ohio	376	119,000	6,650	126,000	W	W	W	119,000 <sup>10</sup>	6,650 10	126,000 10
Oklahoma	172	55,300	4,200	59,500	W	W	W	55,300 <sup>10</sup>	4,200 10	59,500 <sup>10</sup>
Oregon	371	41,000	3,160	44,200				41,000	3,160	44,200
Pennsylvania	362	119,000	8,310	128,000	3,560	25	3,580	123,000	8,330	131,000
Rhode Island	28	3,940	108	4,050	5,500		5,560	3,940	108	4,050
South Carolina	128	37,600	3,250	40,900	W	W	W	37,600 <sup>10</sup>	3,250 10	40,900 10
South Dakota	243	21,600	10,600	32,200				21,600	10,600	32,200
Tennessee	215	60,900	5,020	65,900	4,830	W	4,830 <sup>6</sup>	65,700	5,020 <sup>6</sup>	70,700 <sup>6</sup>
Texas	564	217,000	11,500	229,000	5,330	W	5,330 <sup>6</sup>	223,000	11,500 <sup>6</sup>	234,000 6
Utah	382	83,100	11,500 W	83,100 <sup>6</sup>	764		764	83,900	11,300 W	83,900 <sup>6</sup>
Vermont	118	9,010	390	9,400	W		W	9,010 <sup>10</sup>		9,400 <sup>10</sup>
Virginia	208	77,900	8,640	9,400 86,500				77,900	8,640	86,500
Washington	373	51,700	1,030	52,700				51,700	1,030	52,700
			1,030		2 940	 W			1,030 887 <sup>6</sup>	52,700 17,000 <sup>6</sup>
West Virginia	61	13,200		14,100	2,840	W	$2,840^{-6}$	16,100		,
Wisconsin	619	75,400	2,840	78,200	0.140		0.140	75,400	2,840	78,200
Wyoming 114	367	16,600	3,400	20,000	9,140	2 000	9,140	25,700	3,400	29,100
Undistributed <sup>14</sup>	14 721	537,000	510,000	1,050,000	27,100	3,000	30,100	564,000	512,000	1,080,000
Total	14,721	3,930,000	1,440,000	5,380,000	121,000	3,290	124,000	4,050,000	1,450,000	5,500,000

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

<sup>&</sup>lt;sup>1</sup>Data are rounded to no more than three significant digits except "Number of mines;" may not add to totals shown.

<sup>&</sup>lt;sup>2</sup>Includes materials from wells, ponds, and pumping operations.

<sup>&</sup>lt;sup>3</sup>Includes solution mining.

<sup>&</sup>lt;sup>4</sup>Includes quarries and other mineral operations.

<sup>&</sup>lt;sup>5</sup>Includes ore and waste from development operations.

<sup>&</sup>lt;sup>6</sup>Excludes waste from mining operations and ore and waste from development operations.

<sup>&</sup>lt;sup>7</sup>Excludes materials from surface operations.

<sup>&</sup>lt;sup>8</sup>Includes beryllium, copper, gold-silver, lead, magnesium metal, molybdenum, platinum and palladium, silver, titanium, uranium, and metals indicated by symbol W.

<sup>&</sup>lt;sup>9</sup>Withheld to avoid disclosing company proprietary data; included with "Grand total."

 $<sup>^{10}\</sup>mathrm{Excludes}$  materials from underground operations.

<sup>&</sup>lt;sup>11</sup>Includes aplite.

<sup>&</sup>lt;sup>12</sup>Excludes volcanic cinder and scoria; included with "Crushed stone."

<sup>&</sup>lt;sup>13</sup>Includes abrasives, boron minerals, bromine, garnet, greensand marl, iodine, iron oxide pigments, kyanite, lithium minerals, magnesium compounds, mica, olivine, perlite, potash, vermiculite, wollastonite, zeolites, and industrial minerals indicated by symbol W.

<sup>&</sup>lt;sup>14</sup>Includes States indicated by symbol W.

TABLE 3  ${\it VALUE OF PRINCIPAL MINERAL PRODUCTS AND BY PRODUCTS OF SURFACE AND UNDERGROUND MINES IN THE UNITED STATES IN 2003^1 } \\$ 

(Dollars per metric ton)

		Surface		1	Underground			All mines	
	Principal mineral			Principal mineral			Principal mineral		
Commodity	product	Byproduct	Total	product	Byproduct	Total	product	Byproduct	Total
Metal:	1	J1			J1		1		
Gold	14.61	0.13	14.74	81.27	W	81.27 2	16.38	0.13	16.51
Iron	8.12		8.12				8.12		8.12
Zinc	W	W	W	39.52	W	39.52 <sup>2</sup>	39.52	. W	39.52 <sup>2, 3</sup>
Average, metals <sup>4</sup>	8.35	0.58	8.93	71.08	13.63	84.71	9.47	0.81	10.28
Industrial minerals:									
Barite	21.94		21.94				21.94		21.94
Clays	41.43		41.43	W		W	41.43		41.43 5
Diatomite	121.72		121.72				121.72		121.72
Feldspar <sup>6</sup>	22.00	W	22.00 <sup>2</sup>				22.00	W	22.00 2
Gypsum	6.43		6.43	7.71		7.71	6.59		6.59
Phosphate rock	6.17		6.17				6.17		6.17
Pumice <sup>7</sup>	25.20		25.20				25.20		25.20
Salt	69.43		69.43	17.31		17.31	25.71		25.71
Sand and gravel:									
Construction	5.14	W	$5.14^{-2}$				5.14	W	$5.14^{-2}$
Industrial	22.23	W	22.23 2	W		W	22.23	W	22.23 2,5
Soda ash				71.88	W	71.88 2	71.88	W	71.88 2
Stone:									
Crushed	5.97		5.97	6.22		6.22	5.98		5.98
Dimension	199.98		199.98	W		W	199.98		199.98 5
Talc and pyrophyllite	27.96		27.96	W		W	27.96 <sup>5</sup>		27.96 5
Average, industrial minerals, excluding sand and									
gravel and stone <sup>8</sup>	19.32	0.23	19.55	27.65	0.29	27.94	21.08	0.24	21.32
Average, metals and industrial minerals <sup>4, 8</sup>	7.23	0.14	7.37	24.26	1.71	25.96	7.79	0.20	7.99
Average, metals and industrial minerals, excluding									
sand and gravel and stone <sup>4, 8</sup>	10.80	0.50	11.30	35.93	2.83	38.76	12.54	0.66	13.20

W Withheld to avoid disclosing company proprietary data; included in appropriate "Average." -- Zero.

<sup>&</sup>lt;sup>1</sup>Values calculated from unrounded data; may not add to totals shown because of independent rounding.

<sup>&</sup>lt;sup>2</sup>Value of principal mineral product only.

<sup>&</sup>lt;sup>3</sup>Value of products at underground operations only.

<sup>&</sup>lt;sup>4</sup>Includes values of beryllium concentrate, copper, gold-silver ore, lead, magnesium metal, molybdenum, platinum and palladium, silver, titanium, and metals indicated by symbol W.

<sup>&</sup>lt;sup>5</sup>Value of products at surface operations only.

<sup>&</sup>lt;sup>6</sup>Includes aplite.

<sup>&</sup>lt;sup>7</sup>Excludes volcanic cinder and scoria; included with crushed and broken stone.

<sup>&</sup>lt;sup>8</sup>Includes values of abrasives, boron minerals, bromine, garnet, greensand marl, iodine, iron oxide pigments, kyanite, lithium minerals, magnesite, magnesium compounds, mica, olivine, perlite, potash, tripoli, vermiculite, wollastonite, zeolites, and industrial minerals indicated by symbol W.

TABLE 4 TWENTY-FIVE LEADING METAL AND INDUSTRIAL MINERAL MINES AND QUARRIES IN THE UNITED STATES IN 2003, IN ORDER OF OUTPUT OF CRUDE ORE

Type of ore and name of mine, quarry, or operation <sup>1</sup>	State	Operator	Commodity	Mining method
Metal ore:		•		
Morenci	Arizona	Phelps Dodge Corp.	Copper-molybdenum ore	Open pit.
Newmont Nevada Operations <sup>2</sup>	Nevada	Newmont Gold Company	Gold ore	Open pit and stoping
Betze-Post/Goldstrike	do.	Barrick Gold Corporation	do.	Open pit.
Minntac	Minnesota	USX Corp.	Iron ore	Do.
Bagdad	Arizona	Phelps Dodge Corp.	Copper ore	Do.
Ray	do.	ASARCO Incorporated	do.	Do.
Bingham Canyon	Utah	Kennecott Utah Copper Corp.	do.	Do.
Sierrita	Arizona	Phelps Dodge Corp.	Copper-molybdenum ore	Do.
Fort Knox and True North Mines	Alaska	Fairbanks Gold Mining Inc.	Gold ore	Do.
Hibbing Taconite Co.	Minnesota	Cleveland-Cliffs, Inc.	Iron ore	Do.
Mission Complex	Arizona	ASARCO Incorporated	Copper ore	Open pit and stoping
Cortez	Nevada	Placer Dome Inc.	Gold ore	Open pit.
Round Mountain	do.	Round Mountain Gold Corporation	do.	Do.
Tilden Mining Co.	Michigan	Cleveland-Cliffs, Inc.	Iron ore	Do.
Florida Canyon	Nevada	Florida Canyon Mining, Inc.	Gold ore	Do.
Cresson	Colorado	Cripple Creek & Victor Gold Mining Co.	do.	Do.
Empire Iron Mining Partnership	Michigan	Cleveland-Cliffs, Inc.	Iron ore	Do.
Tyrone	New Mexico	Phelps Dodge Corp.	Copper ore	Do.
Peter Mitchell Mine	Minnesota	Northshore Mining Co.	Iron ore	Do.
Chino	New Mexico	Phelps Dodge Corp.	Copper-molybdenum ore	Do.
Iluka Green Cove Springs FL	Florida	Iluka Resources Inc.	Titanium ore	Dredging.
National Steel Pellet Co.	Minnesota	National Steel Pellet Co.	Iron ore	Open pit.
Laurentian Mine	do.		do.	Do.
Marigold Marigold	Nevada	Ispat Inland Mining Co.	Gold ore	
Silver Bell	Arizona	Glamis Gold Ltd.	Copper ore	Do.  Open pit and stoping.
Industrial minerals:	AHZOHA	ASARCO Incorporated	Copper ore	Open pit and stoping.
	Flanida	IMC Dhambatas MD Inc	Dll 4 1-	D-
Florida mines (four)	Florida	IMC Phosphates MP Inc.	Phosphate rock	Do.
Florida mines (two)	do.	Cargill Crop Nutrition	do.	
Swift Creek	do.	PCS Phosphate Co., Inc.	do.	Do.
South Pasture	do.	C F Industries, Inc.	do.	Do.
F.E.C. Quarry	do.	Rinker Materials Corporation	Stone	Open quarry.
Georgetown	Texas	Texas Crushed Stone Co., Inc.	do.	Do.
Pennsuco	Florida	Titan Atlantic LLC (Tarmac America, Inc.)	do.	Do.
Crushed Limestone Operation	Missouri	Tower Rock Stone Co.	do.	Do.
Aurora	North Carolina	PCS Phosphate Co., Inc.	Phosphate rock	Open pit.
IMC-Carlsbad	New Mexico	IMC Kalium Ltd.	Potash	Stoping.
McCook 378	Illinois	Vulcan Materials Co.	Stone	Open quarry.
Cleburne Base #299	Texas	Trinity Industries Inc. (Trinity Materials Inc.)	do.	Do.
Thorton	Illinois	Material Services Corporation	do.	Do.
TXI-Midlothian Cement Plant	Texas	TXI Operations, L.P.	do.	Do.
Reed Quarry	Kentucky	Vulcan Materials Co.	do.	Do.
Brooksville Gregg Mine	Florida	Rinker Materials Corporation	do.	Do.
Stoneport Quarry	Michigan	Lafarge North America Inc.	do.	Do.
Clinton Plant	New York	Oldcastle Inc./Materials Group	do.	Do.
OMYA CA Inc.	California	Pluess-Stauffer (CA) Ind., Inc.	do.	Do.
Balcones Plant	Texas	Cemex, Inc.	do.	Do.
Alico Road Quarry	Florida	Rinker Materials Corporation	do.	Do.
Sandusky Quarry	Ohio	Hanson Building Materials America	do.	Do.
Hunter Quarry	Texas	Colorado Materials Ltd.	do.	Do.
GKK Mines	Florida	Palm Beach Aggregates	do.	Do.
Romeo Quarry	Illinois	Material Services Corporation		Do.

<sup>&</sup>lt;sup>1</sup>Owing to commodity reporting differences, the rank of individual mining operations may not be available.

<sup>&</sup>lt;sup>2</sup>Includes Battle Mountain Gold complex, Carlin Mines complex, Gold Quarry, Lone Tree complex, Twin Creeks Mine, and Reona Mine.

TABLE 5 TWENTY-FIVE LEADING METAL AND INDUSTRIAL MINERAL MINES AND QUARRIES IN THE UNITED STATES IN 2003, IN ORDER OF OUTPUT OF TOTAL MATERIAL HANDLED

Type of ore and name of mine, quarry, or operation <sup>1</sup>	State	Operator	Commodity	Mining method
Metal ore:				
Betze-Post/Goldstrike	Nevada	Barrick Gold Corporation	Gold ore	Open pit.
Newmont Nevada Operations <sup>2</sup>	do.	Newmont Gold Company	do.	Open pit and stoping
Morenci	Arizona	Phelps Dodge Corp.	Copper-molybdenum ore	Open pit.
Bingham Canyon	Utah	Kennecott Utah Copper Corp.	Copper ore	Do.
Ray	Arizona	ASARCO Incorporated	do.	Do.
Mission Complex	do.	do.	do.	Open pit and stoping
Minntac	Minnesota	USX Corp.	Iron ore	Open pit.
Cortez	Nevada	Placer Dome Inc.	Gold ore	Do.
Bagdad	Arizona	Phelps Dodge Corp.	Copper ore	Do.
Fort Knox and True North Mines	Alaska	Fairbanks Gold Mining Inc.	Gold ore	Do.
Hibbing Taconite Co.	Minnesota	Cleveland-Cliffs, Inc.	Iron ore	Do.
Cresson	Colorado	Cripple Creek & Victor Gold Mining Co.	Gold ore	Do.
Round Mountain	Nevada	Round Mountain Gold Corporation	do.	Do.
Tilden Mining Co.	Michigan	Cleveland-Cliffs, Inc.	Iron ore	Do.
Empire Iron Mining Partnership	do.	do.	do.	Do.
Marigold	Nevada	Glamis Gold Ltd.	Gold ore	Do.
Sierrita	Arizona	Phelps Dodge Corp.	Copper-molybdenum ore	Do.
Florida Canyon	Nevada	Florida Canyon Mining, Inc.	Gold ore	Do.
Peter Mitchell Mine	Minnesota	Northshore Mining Co.	Iron ore	Do.
Silver Bell	Arizona	ASARCO Incorporated	Copper ore	Do.
Laurentian Mine	Minnesota	Ispat Inland Mining Co.	Iron ore	Do.
Rochester	Nevada	Coeur d'Alene Mines Corp.	Gold ore	Do.
Thompson Creek	Idaho	Thompson Creek Metals Co.	Molybdenum ore	Do.
Tyrone	New Mexico	Phelps Dodge Corp.	Copper ore	Do.
Wharf	South Dakota	Wharf Resources, Ltd.	Gold ore	Do.
Industrial minerals:	South Dakota	what Resources, Etc.	Gold of	Ъ0.
Florida mines (four)	Florida	IMC Phosphates MP Inc.	Phosphate rock	Do.
South Fort Meade	do.	Cargill Crop Nutrition	do.	Do.
Swift Creek	do.	PCS Phosphate Co., Inc.	do.	Do.
	do.	C F Industries, Inc.	do.	Do.
South Pasture		,		
F.E.C. Quarry	do.	Rinker Materials Corporation	Stone	Open quarry. Do.
Georgetown	Texas Florida	Texas Crushed Stone Co., Inc.	do.	Do.
Pennsuco Crushed Limestone Operation	Missouri	Titan Atlantic LLC (Tarmac America, Inc.) Tower Rock Stone Co.	do.	Do.
	Illinois			
McCook 378		Vulcan Materials Co.	do.	Do.
Cleburne Base #299	Texas	Trinity Industries Inc. (Trinity Materials Inc.)	do.	Do.
Thorton	Illinois	Material Services Corporation	do.	Do.
Aurora	North Carolina	PCS Phosphate Co., Inc.	Phosphate rock	Open pit.
IMC-Carlsbad	New Mexico	IMC Kalium Ltd.	Potash	Stoping.
TXI-Midlothian Cement Plant	Texas	TXI Operations, L.P.	Stone	Open quarry.
Reed Quarry	Kentucky	Vulcan Materials Co.	do.	Do.
Brooksville Gregg Mine	Florida	Rinker Materials Corporation	do.	Do.
Stoneport Quarry	Michigan	Lafarge North America Inc.	do.	Do.
Clinton Plant	New York	Oldcastle Inc./Materials Group	do.	Do.
OMYA CA Inc.	California	Pluess-Stauffer (CA) Ind., Inc.	do.	Do.
Balcones Plant	Texas	Cemex, Inc.	do.	Do.
Alico Road Quarry	Florida	Rinker Materials Corporation	do.	Do.
Sandusky Quarry	Ohio	Hanson Building Materials America	do.	Do.
Hunter Quarry	Texas	Colorado Materials Ltd.	do.	Do.
GKK Mines	Florida	Palm Beach Aggregates	do.	Do.
Romeo Quarry	Illinois	Material Services Corporation	do.	Do.

Owing to commodity reporting differences, the rank of individual mining operations may not be available.

<sup>&</sup>lt;sup>2</sup>Includes Battle Mountain Gold complex, Carlin Mines complex, Gold Quarry, Lone Tree complex, Twin Creeks Mine, and Reona Mine.

TABLE 6 MARKETABLE PRODUCT AND ORE TREATED OR SOLD AT SURFACE AND UNDERGROUND MINES IN THE UNITED STATES IN 2003, BY SELECTED COMMODITY AND STATE  $^{\rm I}$ 

### (Thousand metric tons)

		ketable produc			treated or sold	
Commodity or State	Surface U	nderground	Total	Surface U	Inderground	Total
Metal ore:	***	***	***	177.000	4.000	100 000
Gold	W	W	W	177,000	4,820	182,000
Iron ore, usable	46,100 345 <sup>2</sup>		46,100	147,000		147,000
Zinc	345 -	W	345	7,410 <sup>3</sup>	W	7,410
Industrial minerals:	***		***	625		(25
Barite	40,000 <sup>2</sup>		40,000	$\frac{635}{40,000^{-3}}$		635
Clays	620	W	40,000		W	40,000
Diatomite 4			620	1,310		1,310 1,830
Feldspar <sup>4</sup> Gypsum	1,620 12,300	1,720	1,620 14,000	1,830 12,300	1,720	1,830
Magnesium compounds	242	1,720	242	W	1,720	14,000 W
Perlite	493		493	493		493
Phosphate rock	35,000		35,000	153,000		153,000
Pumice <sup>5</sup>	870		870	870		870
Salt	W	39,900 <sup>6</sup>	39,900	W	41,600 7	41,600
Sand and gravel:	vv	39,900	39,900	vv	41,000	41,000
Construction	1,160,000		1,160,000	1,160,000		1,160,000
Industrial	27,500 <sup>2</sup>	W	27,500	27,500 <sup>3</sup>	W	27,500
Soda ash	21,300	10,700	10,700	27,300	10,600	10,600
Stone:		10,700	10,700		10,000	10,000
Crushed	1,480,000	50,600	1,530,000	1,480,000	50,600	1,530,000
Dimension	1,310 <sup>2</sup>	W	1,310	1,310 <sup>3</sup>	W	1,310
Talc and pyrophyllite	903 2	W	903	898 3	W	898
Tripoli	69		69	69		69
State:						
Alabama	68,200 <sup>2</sup>	W	68,200	68,200 <sup>3</sup>	W	68,200
Alaska	13,000 2	W	13,000	30,200 <sup>3</sup>	W	30,200
Arizona	W	W	W	W	W	W
Arkansas	42,600 <sup>2</sup>	W	42,600	42,600 <sup>3</sup>	W	42,600
California	216,000 2	W	216,000	225,000 <sup>3</sup>	W	225,000
Colorado	49,300 2	W	49,300	68,600 <sup>3</sup>	W	68,600
Connecticut	18,600		18,600	18,600		18,600
Delaware	2,550		2,550	2,550		2,550
Florida	157,000		157,000	269,000		269,000
Georgia	91,900	1,220	93,100	92,400	1,220	93,600
Hawaii	6,500		6,500	6,500		6,500
Idaho	23,800 2	W	23,800	W	W	W
Illinois	112,000	4,020	116,000	112,000	4,020	116,000
Indiana	84,600 2	W	84,600	84,600 3	W	84,600
Iowa	44,400	6,820	51,200	44,400	6,820	51,200
Kansas	32,700	2,930	35,600	32,700	2,930	35,600
Kentucky	46,700	18,100	64,700	46,700	18,100	64,700
Louisiana	30,900	11,700	42,600	31,600	12,400	44,000
Maine	13,600		13,600	13,600		13,600
Maryland	43,100 2	W	43,100	43,000 3	W	43,000
Massachusetts	26,000		26,000	26,000		26,000
Michigan	121,000	1,870	122,000	144,000	2,100	146,000
Minnesota	93,400		93,400	169,000		169,000
Mississippi	18,800		18,800	18,800		18,800
Missouri	80,100	5,320	85,500	80,100	9,200	89,300
Montana	18,900 <sup>2</sup>	W	18,900	28,400 <sup>3</sup>	W	28,400
Nebraska	20,400	W	20,400	20,400 3	W	20,400
Nevada	48,900 <sup>2</sup>	W	48,900	196,000 <sup>3</sup>	W	196,000
New Hampshire	12,600		12,600	12,600		12,600
New Jersey	44,600		44,600	44,600		44,600
	,					
	W	W	W	W	W	W
New Mexico New York	90,000 <sup>2</sup>	W 	90,000	85,300	4,640	90,000

See footnotes at end of table.

# $TABLE\ 6--Continued$ MARKETABLE PRODUCT AND ORE TREATED OR SOLD AT SURFACE AND UNDERGROUND MINES IN THE UNITED STATES IN 2003, BY SELECTED COMMODITY AND STATE $^{\rm I}$

### (Thousand metric tons)

-	M	arketable produ	ict	C	Ore treated or sold			
Commodity or State	Surface	Underground	Total	Surface	Underground	Total		
StateContinued:								
North Dakota	13,700		13,700	13,700		13,700		
Ohio	124,000 2	W	124,000	124,000 <sup>3</sup>	W	124,000		
Oklahoma	55,900 <sup>2</sup>	W	55,900	55,900 <sup>3</sup>	W	55,900		
Oregon	41,100		41,100	41,400		41,400		
Pennsylvania	121,000	3,560	124,000	121,000	3,560	124,000		
Rhode Island	3,940		3,940	3,940		3,940		
South Carolina	39,500		39,500	39,500		39,500		
South Dakota	19,000		19,000	22,200 <sup>3</sup>	W	22,200		
Tennessee	64,900 2	W	64,900	66,200 <sup>3</sup>	W	66,200		
Texas	219,000	9,240	228,000	219,000	9,410	229,000		
Utah	39,200 2	W	39,200	85,600 <sup>3</sup>	W	85,600		
Vermont	9,050 2	W	9,050	9,050 3	W	9,050		
Virginia	81,200		81,200	83,600		83,600		
Washington	53,300		53,300	53,300		53,300		
West Virginia	13,500	2,840	16,300	13,500	2,840	16,300		
Wisconsin	77,100		77,100	77,100		77,100		
Wyoming	17,000	9,140	26,100	17,000	9,140	26,100		

W Withheld to avoid disclosing company proprietary data. -- Zero.

<sup>&</sup>lt;sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>&</sup>lt;sup>2</sup>Includes marketable product from underground operations.

<sup>&</sup>lt;sup>3</sup>Includes ore treated at underground operations.

<sup>&</sup>lt;sup>4</sup>Includes aplite.

<sup>&</sup>lt;sup>5</sup>Excludes volcanic cinder and scoria; included with "Crushed stone."

<sup>&</sup>lt;sup>6</sup>Includes marketable product from surface operations.

<sup>&</sup>lt;sup>7</sup>Includes ore treated at surface operations.

## TABLE 7 MINING METHODS USED AT SURFACE OPERATIONS IN THE UNITED STATES, BY COMMODITY, IN 2003

### (Percentage of total material handled)

Commodity	Preceded by drilling and blasting	Not preceded by drillin and blasting <sup>1</sup>
Metal ore:	and oldsting	una olasting
Beryllium	100	_
Copper	100	
Gold	99	
Gold-silver	100	
Iron	94	(
Magnesium metal	96	
Molybdenum	100	-
Silver	100	_
Titanium		10
Uranium	<del></del>	10
Zinc	100	10
Industrial minerals:	100	
Abrasives	100	
Barite	2	9
Boron minerals	100	, , ,
Bromine Bromine	100	10
	<del></del>	10
Clays Diatomite		10
		4
Feldspar <sup>2</sup>	60	
Garnet	48	
Greensand marl		10
Gypsum	98	10
Iodine		10
Iron oxide pigments	100	10
Kyanite	100	10
Lithium minerals		10
Magnesite	100	
Magnesium compounds		10
Mica, scrap	2	9
Olivine	58	4
Perlite	25	7
Phosphate rock	2	9
Potash		10
Pumice <sup>3</sup>	53	4
Salt		10
Sand and gravel:		
Construction		10
Industrial		10
Stone:		
Crushed	99	
Dimension		10
Talc and pyrophyllite	82	1
Tripoli	97	
Vermiculite	76	2
Wollastonite	100	
Zeolites	100	

<sup>&</sup>lt;sup>1</sup>Includes drilling and cutting without blasting, dredging, mechanical excavation and nonfloat washing, and other surface mining methods.

<sup>&</sup>lt;sup>2</sup>Includes aplite.

<sup>&</sup>lt;sup>3</sup>Excludes volcanic cinder and scoria; included with "Crushed stone."

 ${\bf TABLE~8} \\ {\bf EXPLORATION~ACTIVITY~IN~THE~UNITED~STATES~IN~2003, BY~METHOD, COMMODITY, AND~STATE}^{1}$ 

#### (Meters)

Commodity or State	Diamond drilling	Rotary and reverse circulation drilling	Percussion drilling, other drilling, and trenching	Grand total
Commodity:				
Gold	279,000	592,000	W	871,000
Silver	41,600	3,000		44,600
Other <sup>2</sup>	(3)	(3)	32,200	32,200
Total	321,000	595,000	32,200	948,000
Percentage of grand total	34.0	63.0	3.0	100.00
State:				
Alaska	46,100	86,600	W	133,000
Colorado	1,000	(3)	W	1,000
Nevada	W	509,000	W	509,000
Undistributed <sup>4</sup>	273,000	(3)	32,200	306,000
Total	321,000	595,000	32,200	948,000

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

<sup>&</sup>lt;sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>&</sup>lt;sup>2</sup>Includes boron minerals, copper, pumice, uranium, and commodities indicated by symbol W.

<sup>&</sup>lt;sup>3</sup>Withheld to avoid disclosing company proprietary data; included with "Percussion drilling, other drilling, and trenching."

<sup>&</sup>lt;sup>4</sup>Includes Arizona, California, Idaho, New Mexico, Utah, and States indicated by symbol W.