

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 2002 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 2002 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, petroleum, coke, and related products.

As shown in this report, mining and quarrying data for 2002 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 2002 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 close 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 5.4 billion metric tons (Gt) in 2002, about the same level as 2001. These materials included 4.0 Gt of crude ore mined or quarried and 1.4 Gt of mine waste and ore from development. Of the nonfuel mineral materials mined, 62% was for the production of industrial minerals, and 38% was for the production of metals. Overall, 97% of nonfuel minerals was mined and quarried at surface level, and 3% was mined underground.

Total surface mining and quarrying for industrial minerals amounted to 3.3 Gt, remaining essentially the same as that of 2001. Crude ore mined at these surface operations was 2.8 Gt, and 383 million metric tons (Mt) was waste and ore from development. Underground mining for industrial minerals amounted to only 115 Mt, nearly all of which was crude ore.

Total surface mining for metal ores came to 2.1 Gt, slightly less than that of 2001. Of the 2.1 Gt, about 1.1 Gt was crude ore mined, and the other 1.0 Gt was waste and ore from development. Underground mining of metal ores amounted to only 26 Mt, of which 85% 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, New Mexico, and Ohio. These 10 States accounted for about 62% of the tonnage of nonfuel minerals mined in the United States. Virtually all nonfuel mining in these States was conducted from the surface.

TABLE 1
MATERIAL HANDLED AT SURFACE AND UNDERGROUND MINES IN THE UNITED STATES, BY TYPE¹

(Million metric tons)

Type of ore and year	Surface ²			Underground ³			All mines		
	Crude ore	Waste ⁴	Total	Crude ore	Waste ⁴	Total	Crude ore	Waste ⁴	Total
Metals:									
1998	1,100	1,500	2,600	50	3	53	1,150	1,500	2,650
1999	1,060	1,050	2,110	26	2	27	1,080	1,050	2,130
2000	1,100	1,020	2,130	32	1	33	1,140	1,030	2,160
2001	1,030	1,120	2,160	25	3	28	1,060	1,130	2,180
2002	1,040	1,020	2,060	22	4	26	1,060	1,030	2,090
Industrial minerals:									
1998	2,750	426	3,180	109	1	109	2,860	427	3,290
1999	2,790	382	3,170	106	(5)	106	2,890	383	3,280
2000	2,780	354	3,140	108	(5)	108	2,890	354	3,240
2001	2,840 ^r	331	3,170 ^r	113 ^r	(5)	113 ^r	2,950	332	3,280
2002	2,850	383	3,230	115	(5)	115	2,960	383	3,350
All mineral commodities:									
1998	3,850	1,930	5,780	159	4	163	4,010	1,930	5,940
1999	3,840	1,430	5,280	132	2	134	3,980	1,430	5,410
2000	3,890	1,380	5,260	140	1	141 ^r	4,030	1,380	5,410 ^r
2001	3,870 ^r	1,460	5,330	138 ^r	3	141 ^r	4,010	1,460	5,470
2002	3,890	1,410	5,290	137	4	141	4,020	1,410	5,440

^rRevised.

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

²Includes materials from wells, ponds, and pumping operations.

³Includes solution mining.

⁴Includes ore and waste from development operations.

⁵Less than 1/2 unit.

TABLE 2
MATERIAL HANDLED AT SURFACE AND UNDERGROUND MINES IN THE UNITED STATES IN 2002, BY COMMODITY AND STATE¹

(Thousand metric tons)

Type of ore or State	Number of mines ⁴	Surface ²			Underground ³			All mines		
		Crude ore (thousand metric tons)	Waste ⁵ (thousand metric tons)	Total (thousand metric tons)	Crude ore (thousand metric tons)	Waste ⁵ (thousand metric tons)	Total (thousand metric tons)	Crude ore (thousand metric tons)	Waste ⁵ (thousand metric tons)	Total (thousand metric tons)
Metal ore:										
Gold	46	198,000	774,000	972,000	5,610	2,170	7,780	204,000	777,000	980,000
Iron	10	168,000	109,000	276,000	--	--	--	168,000	109,000	276,000
Zinc	6	W	W	W	3,050	W	3,050 ⁶	3,050 ⁷	W	3,050 ^{6,7}
Other ⁸	38	672,000	142,000	814,000	13,600	1,560	15,200	685,000	144,000	829,000
Total	100	1,040,000	1,020,000	2,060,000	22,300	3,730	26,000	1,060,000	1,030,000	2,090,000
Industrial minerals:										
Barite	6	815	W	815 ⁶	--	--	--	815	W	815 ⁶
Clays	591	39,300	34,200	73,400	W	W	W	39,300 ⁹	34,200 ⁹	73,400 ⁹
Diatomite	11	1,270	3,030	4,300	--	--	--	1,270	3,030	4,300
Feldspar ¹⁰	11	1,500	W	1,500 ⁶	--	--	--	1,500	W	1,500 ⁶
Gypsum	48	13,200	2,750	15,900	1,580	--	1,580	14,700	2,750	17,500
Phosphate rock	15	154,000	W	154,000 ⁶	--	--	--	154,000	W	154,000 ⁶
Pumice ¹¹	20	986	640	1,630	--	--	--	986	640	1,630
Salt	67	6,510	--	6,510	27,600	--	27,600	34,100	--	34,100
Sand and gravel:										
Construction	10,336	1,130,000	--	1,130,000	--	--	--	1,130,000	--	1,130,000
Industrial	143	26,800	--	26,800	W	--	W	26,800 ⁹	--	26,800 ⁹
Soda ash	7	--	--	--	10,500	--	10,500	10,500	--	10,500
Stone:										
Crushed	3,306	1,460,000	113,000	1,570,000	60,000	312	60,300	1,520,000	113,000	1,630,000
Dimension	169	1,210	616	1,830	W	--	W	1,210 ⁹	616	1,830 ⁹
Talc and pyrophyllite	14	601	3,020	3,620	W	--	W	601 ⁹	3,020	3,620 ⁹
Tripoli	6	68	--	68	--	--	--	68	--	68
Other ¹²	76	10,300	225,000	236,000	15,000	--	15,000	25,300	225,000	251,000
Total	14,826	2,850,000	383,000	3,230,000	115,000	312	115,000	2,960,000	383,000	3,350,000
Grand total	14,926	3,890,000	1,410,000	5,290,000	137,000	4,050	141,000	4,020,000	1,410,000	5,440,000
State:										
Alabama	184	57,800	5,670	63,500	W	W	W	57,800 ⁹	5,670 ⁹	63,500 ⁹
Alaska	204	53,700	46,400	100,000	W	W	W	53,700 ⁹	46,400 ⁹	100,000 ⁹
Arizona	456	W	W	W	W	W	W	W	W	W
Arkansas	157	41,300	4,700	46,000	W	--	W	41,300 ⁹	4,700	46,000 ⁹
California	860	241,000	32,300	273,000	W	--	W	241,000 ⁹	32,300	273,000 ⁹
Colorado	410	68,200	31,900	100,000	W	--	W	68,200 ⁹	31,900	100,000 ⁹
Connecticut	101	18,300	862	19,200	--	--	--	18,300	862	19,200
Delaware	9	2,190	--	2,190	--	--	--	2,190	--	2,190
Florida	187	272,000	W	272,000 ⁶	--	--	--	272,000	W	272,000 ⁶
Georgia	210	86,600	13,900	100,000	1,060	7	1,070	87,600	13,900	101,000
Hawaii	26	6,600	457	7,060	--	--	--	6,600	457	7,060
Idaho	541	28,300	W	28,300 ⁶	W	W	W	28,300 ⁹	W	28,300 ^{6,9}
Illinois	304	100,000	5,180	106,000	11,500	34	11,500	112,000	5,210	117,000
Indiana	277	79,600	4,600	84,200	3,360	20	3,380	83,000	4,620	87,600
Iowa	397	43,800	2,540	46,400	6,550	40	6,590	50,400	2,570	53,000
Kansas	400	32,100	2,270	34,400	2,870	4	2,870	35,000	2,280	37,200
Kentucky	141	45,300	3,700	49,000	15,500	108	15,600	60,800	3,810	64,600
Louisiana	154	25,100	714	25,800	13,400	--	13,400	38,500	714	39,200
Maine	203	13,500	340	13,900	--	--	--	13,500	340	13,900
Maryland	100	38,600	2,340	40,900	W	W	W	38,600 ⁹	2,340 ⁹	40,900 ⁹
Massachusetts	150	25,600	1,150	26,700	--	--	--	25,600	1,150	26,700
Michigan	605	157,000	W	157,000 ⁶	1,760	--	1,760	159,000	W	159,000 ⁶
Minnesota	535	186,000	69,800	256,000	--	--	--	186,000	69,800	256,000
Mississippi	116	16,900	1,050	17,900	--	--	--	16,900	1,050	17,900
Missouri	315	82,000	7,020	89,000	8,740	29	8,760	90,700	7,050	97,800
Montana	263	24,100	W	24,100 ⁶	1,370	W	1,370 ⁶	25,400	W	25,400 ⁶
Nebraska	167	18,300	538	18,900	1,940	14	1,950	20,300	552	20,800
Nevada	830	331,000	509,000	840,000	5,350	W	5,350 ⁶	336,000	509,000 ⁶	845,000 ⁶
New Hampshire	100	13,500	606	14,100	--	--	--	13,500	606	14,100

See footnotes at end of table.

TABLE 2--Continued
MATERIAL HANDLED AT SURFACE AND UNDERGROUND MINES IN THE UNITED STATES IN 2002, BY COMMODITY AND STATE¹

(Thousand metric tons)

Type of ore or State	Number of mines ⁴	Surface ²			Underground ³			All mines		
		Crude ore (thousand metric tons)	Waste ⁵ (thousand metric tons)	Total (thousand metric tons)	Crude ore (thousand metric tons)	Waste ⁵ (thousand metric tons)	Total (thousand metric tons)	Crude ore (thousand metric tons)	Waste ⁵ (thousand metric tons)	Total (thousand metric tons)
State--Continued:										
New Jersey	101	37,100	1,670	38,800	--	--	--	37,100	1,670	38,800
New Mexico	637	W	W	W	W	W	W	W	W	W
New York	634	85,600	5,570	91,100	4,120	--	4,120	89,700	5,570	95,300
North Carolina	265	84,500	9,890	94,400	--	--	--	84,500	9,890	94,400
North Dakota	157	10,800	W	10,800 ⁶	--	--	--	10,800	W	10,800 ⁶
Ohio	478	122,000	6,970	129,000	W	W	W	122,000 ⁹	6,970 ⁹	129,000 ⁹
Oklahoma	171	58,900	4,490	63,400	W	W	W	58,900 ⁹	4,490 ⁹	63,400 ⁹
Oregon	381	39,300	3,040	42,300	--	--	--	39,300	3,040	42,300
Pennsylvania	372	118,000	8,370	126,000	3,500	24	3,520	121,000	8,390	129,000
Rhode Island	22	3,250	107	3,360	--	--	--	3,250	107	3,360
South Carolina	131	36,300	3,190	39,500	--	--	--	36,300	3,190	39,500
South Dakota	277	22,000	26,900	48,900	--	--	--	22,000	26,900	48,900
Tennessee	207	63,100	5,000	68,100	3,520	W	3,520 ⁶	66,600	5,000 ⁶	71,600 ⁶
Texas	580	200,000	10,600	210,000	4,360	--	4,360	204,000	10,600	215,000
Utah	378	81,500	W	81,500 ⁶	651	W	651 ⁶	82,200	W	82,200 ⁶
Vermont	121	9,580	687	10,300	W	--	W	9,580 ⁹	687	10,300 ⁹
Virginia	204	69,600	7,710	77,300	--	--	--	69,600	7,710	77,300
Washington	397	56,800	1,160	58,000	179	162	341	57,000	1,330	58,300
West Virginia	73	14,300	1,040	15,300	2,980	W	2,980 ⁶	17,200	1,040 ⁶	18,300 ⁶
Wisconsin	609	76,400	2,910	79,300	--	--	--	76,400	2,910	79,300
Wyoming	329	16,000	3,330	19,300	8,940	--	8,940	24,900	3,330	28,200
Undistributed ¹³	--	574,000	557,000	1,130,000	35,300	3,600	38,900	610,000	561,000	1,170,000
Total	14,926	3,890,000	1,410,000	5,290,000	137,000	4,050	141,000	4,020,000	1,410,000	5,440,000

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

¹Data are rounded to no more than three significant digits except "number of mines;" may not add to totals shown.

²Includes materials from wells, ponds, and pumping operations.

³Includes solution mining.

⁴Includes quarries and other mineral operations.

⁵Includes ore and waste from development operations.

⁶Excludes waste from mining operations and ore and waste from development operations.

⁷Excludes materials from surface operations.

⁸Includes beryllium, copper, gold-silver, lead, magnesium metal, molybdenum, platinum and palladium, rare-earth metal concentrates, silver, titanium, uranium, and metals indicated by symbol W.

⁹Excludes materials from underground operations.

¹⁰Includes aplite.

¹¹Excludes volcanic cinder and scoria; included with crushed and broken stone.

¹²Includes abrasives, asbestos, boron minerals, bromine, emery, garnet, greensand marl, iodine, iron oxide pigments, kyanite, lithium minerals, magnesite, magnesium compounds, mica, olivine, perlite, potash, vermiculite, wollastonite, zeolites, and industrial minerals indicated by symbol W.

¹³Includes States indicated by symbol W.

TABLE 3

VALUE OF PRINCIPAL MINERAL PRODUCTS AND BYPRODUCTS OF SURFACE AND UNDERGROUND MINES IN THE UNITED STATES IN 2002¹

(Dollars per metric ton)

Type of ore and commodity	Surface			Underground			All mines		
	Principal mineral product	By-product	Total	Principal mineral product	By-product	Total	Principal mineral product	By-product	Total
Metal:									
Gold	11.07	0.12	11.19	67.96	W	67.96 ²	13.11	0.12	13.23
Iron	6.87	--	6.87	--	--	--	6.87	--	6.87
Zinc	W	W	W	39.43	W	39.43 ²	39.43 ²	W	39.43 ^{2,3}
Average, metals ⁴	6.56	0.46	7.02	62.06	8.68	70.74	7.70	0.62	8.32
Industrial minerals:									
Barite	15.34	--	15.34	--	--	--	15.34	--	15.34
Clays	40.32	--	40.32	W	--	W	40.32 ⁵	--	40.32 ⁵
Diatomite	121.04	--	121.04	--	--	--	121.04	--	121.04
Feldspar ⁶	18.54	W	18.54 ²	--	--	--	18.54	W	18.54 ²
Gypsum	6.18	--	6.18	8.65	--	8.65	6.44	--	6.44
Phosphate rock	6.46	--	6.46	--	--	--	6.46	--	6.46
Pumice ⁷	15.76	--	15.76	--	--	--	15.76	--	15.76
Salt	72.51	--	72.51	15.70	--	15.70	25.13	--	25.13
Sand and gravel:									
Construction	5.05	W	5.05 ²	--	--	--	5.05	W	5.05 ²
Industrial	21.07	W	21.07 ²	W	--	W	21.07	W	21.07 ^{2,5}
Soda ash	--	--	--	74.96	--	74.96	74.96	--	74.96
Stone:									
Crushed	5.71	--	5.71	5.92	--	5.92	5.71	--	5.71
Dimension	202.56	--	202.56	W	--	W	202.56 ⁵	--	202.56 ⁵
Talc and pyrophyllite	25.37	--	25.37	W	--	W	25.37 ⁵	--	25.37 ⁵
Average, industrial minerals, excluding sand and gravel and stone ⁸	18.72	0.20	18.92	27.12	--	27.12	20.44	0.16	20.60
Average, metals and industrial minerals ^{3,8}	6.68	0.13	6.81	23.27	1.21	24.48	7.24	0.16	7.40
Average, metals and industrial minerals, excluding sand and gravel and stone ^{3,8}	9.04	0.41	9.45	35.46	2.07	37.53	10.73	0.51	11.24

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

¹Values calculated from unrounded data; may not add to totals shown because of independent rounding.²Value of principal mineral product only.³Value of products at underground operations only.⁴Includes values of beryllium concentrate, copper, gold-silver ore, lead, magnesium metal, molybdenum, platinum and palladium, rare-earth metal concentrate, silver, titanium, and metals indicated by symbol W.⁵Value of products at surface operations only.⁶Includes aplite.⁷Excludes volcanic cinder and scoria; included with crushed and broken stone.⁸Includes values of abrasives, asbestos, boron minerals, bromine, emery, 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 2002,
 IN ORDER OF OUTPUT OF CRUDE ORE

Type of ore and name of mine, quarry, or operation ¹	State	Operator	Commodity	Mining method
Metal ore:				
Morenci	Arizona	Phelps Dodge Corp.	Copper-molybdenum ore	Open pit.
Newmont Nevada Operations ²	Nevada	Newmont Gold Company	Gold ore	Open pit and stoping.
Round Mountain	do.	Round Mountain Gold Corporation	do.	Open pit.
Minntac	Minnesota	USX Corp.	Iron ore	Do.
Chino	New Mexico	Phelps Dodge Corp.	Copper-molybdenum ore	Do.
Tyrone	do.	do.	Copper ore	Do.
Bingham Canyon	Utah	Kennecott Utah Copper Corp.	do.	Do.
Bagdad	Arizona	Phelps Dodge Corp.	do.	Do.
Fort Knox	Alaska	Fairbanks Gold Mining Inc.	Gold ore	Do.
Mission Complex	Arizona	ASARCO Incorporated	Copper ore	Open pit and stoping.
Ray	do.	do.	do.	Open pit.
Cortez	Nevada	Placer Dome Inc.	Gold ore	Do.
Hibbing Taconite Co.	Minnesota	Cleveland-Cliffs, Inc.	Iron ore	Do.
Sierrita	Arizona	Phelps Dodge Corp.	Copper-molybdenum ore	Do.
Tilden Mining Co.	Michigan	Cleveland-Cliffs, Inc.	Iron ore	Do.
National Steel Pellet Co.	Minnesota	National Steel Pellet Co.	do.	Do.
Rochester	Nevada	Coeur d'Alene Mines Corp.	Gold-silver ore	Do.
Empire Iron Mining Partnership	Michigan	Cleveland-Cliffs, Inc.	Iron ore	Do.
Betze-Post/Goldstrike	Nevada	Barrick Gold Corporation	Gold ore	Do.
Thunderbird	Minnesota	EVTAC Mining Co.	Iron ore	Do.
Cresson	Colorado	Cripple Creek & Victor Gold Mining Co.	Gold ore	Do.
Peter Mitchell Mine	Minnesota	Northshore Mining Co.	Iron ore	Do.
Rand	California	Glamis Rand Mining Co.	Gold ore	Do.
Iluka Green Cove Springs FL	Florida	Iluka Resources Inc.	Titanium ore	Dredging.
Florida Canyon	Nevada	Florida Canyon Mining, Inc.	Gold ore	Open pit.
Wharf	South Dakota	Wharf Resources, Ltd.	do.	Do.
Industrial minerals:				
Florida mines (four)	Florida	IMC-Agrico Co.	Phosphate rock	Do.
Florida mines (two)	do.	Cargill Fertilizer, Inc.	do.	Do.
South Pasture	do.	C F Industries, Inc.	do.	Do.
F.E.C. Quarry	do.	Rinker Materials Corporation	Stone	Open quarry.
White Rock Quarries	do.	Vecellio & Grogan, Inc.	do.	Dredging.
Swift Creek	do.	PCS Phosphate Co., Inc.	Phosphate rock	Open pit.
Georgetown	Texas	Texas Crushed Stone Co., Inc.	Stone	Open quarry.
Black Mountain	California	Cemex, Inc.	do.	Do.
Aurora	North Carolina	PCS Phosphate Co., Inc.	Phosphate rock	Open pit.
Pennsuco	Florida	Titan Atlantic LLC (Tarmac America, Inc.)	Stone	Open quarry.
Calcite Operation	Michigan	Oglebay Norton Co. (Michigan Limestone Operations)	do.	Do.
Clinton Plant	New York	Oldcastle Inc./Materials Group	do.	Do.
Crushed Limestone Operation	Missouri	Tower Rock Stone Co.	do.	Do.
Reed Quarry	Kentucky	Vulcan Materials Co.	do.	Do.
IMC-Carlsbad	New Mexico	IMC Kalium Ltd.	Potash	Stoping.
Stoneport Quarry	Michigan	Lafarge North America Inc.	Stone	Open quarry.
Thorton	Illinois	General Dynamics Corp.	do.	Do.
McCook 378	do.	Vulcan Materials Co.	do.	Do.
OMYA CA Inc.	California	Pluess-Stauffer (CA) Ind., Inc.	do.	Do.
Alico Road Quarry	Florida	Rinker Materials Corporation	do.	Do.
TXI-Midlothian Cement Plant	Texas	TXI Operations, L.P.	do.	Do.
GKK Mines	Florida	Palm Beach Aggregates	do.	Do.
Haverstraw Quarry	New York	Oldcastle Inc./Materials Group	do.	Do.
Servtex	Texas	Hanson Building Materials America	do.	Do.
New Braunfels	do.	Cemex, Inc.	do.	Do.

¹Owing to commodity reporting differences, the rank of individual mining operations may not be available.

²Includes Battle Mountain Gold, Carlin Mines Complex, Lone Tree, Twin Creeks, and Reona.

TABLE 5
 TWENTY-FIVE LEADING METAL AND INDUSTRIAL MINERAL MINES AND QUARRIES IN THE UNITED STATES IN 2002,
 IN ORDER OF OUTPUT OF TOTAL MATERIAL HANDLED

Type of ore and name of mine, quarry, or operation ¹	State	Operator	Commodity	Mining method
Metal ore:				
Newmont Nevada Operations ²	Nevada	Newmont Gold Company	Gold ore	Open pit and stoping.
Morenci	Arizona	Phelps Dodge Corp.	Copper-molybdenum ore	Open pit.
Betze-Post/Goldstrike	Nevada	Barrick Gold Corporation	Gold ore	Do.
Ray	Arizona	ASARCO Incorporated	Copper ore	Do.
Bingham Canyon	Utah	Kennecott Utah Copper Corp.	do.	Do.
Cortez	Nevada	Placer Dome Inc.	Gold ore	Do.
Round Mountain	do.	Round Mountain Gold Corporation	do.	Do.
Mission Complex	Arizona	ASARCO Incorporated	Copper ore	Open pit and stoping.
Fort Knox	Alaska	Fairbanks Gold Mining Inc.	Gold ore	Open pit.
Minntac	Minnesota	USX Corp.	Iron ore	Do.
Chino	New Mexico	Phelps Dodge Corp.	Copper-molybdenum ore	Do.
Bagdad	Arizona	do.	Copper ore	Do.
Hibbing Taconite Co.	Minnesota	Cleveland-Cliffs, Inc.	Iron ore	Do.
Cresson	Colorado	Cripple Creek & Victor Gold Mining Co.	Gold ore	Do.
Tyrone	New Mexico	Phelps Dodge Corp.	Copper ore	Do.
Tilden Mining Co.	Michigan	Cleveland-Cliffs, Inc.	Iron ore	Do.
Empire Iron Mining Partnership	do.	do.	do.	Do.
Wharf	South Dakota	Wharf Resources, Ltd.	Gold ore	Do.
National Steel Pellet Co.	Minnesota	National Steel Pellet Co.	Iron ore	Do.
Rand	California	Glamis Rand Mining Co.	Gold ore	Do.
Silver Bell	Arizona	ASARCO Incorporated	Copper ore	Do.
Thunderbird	Minnesota	EVTAC Mining Co.	Iron ore	Do.
Marigold	Nevada	Glamis Rand Mining Co.	Gold ore	Do.
Sierrita	Arizona	Phelps Dodge Corp.	Copper-molybdenum ore	Do.
Florida Canyon	Nevada	Florida Canyon Mining, Inc.	Gold ore	Do.
Industrial minerals:				
Florida mines (four)	Florida	IMC-Agrico Co.	Phosphate rock	Do.
South Fort Meade	do.	Cargill Fertilizer, Inc.	do.	Do.
South Pasture	do.	C F Industries, Inc.	do.	Do.
F.E.C. Quarry	do.	Rinker Materials Corporation	Stone	Open quarry.
White Rock Quarries	do.	Vecellio & Grogan, Inc.	do.	Dredging.
Aurora	North Carolina	PCS Phosphate Co., Inc.	Phosphate rock	Open pit.
Georgetown	Texas	Texas Crushed Stone Co., Inc.	Stone	Open quarry.
Swift Creek	Florida	PCS Phosphate Co., Inc.	Phosphate rock	Open pit.
Black Mountain	California	Cemex, Inc.	Stone	Open quarry.
Pennsuco	Florida	Titan Atlantic LLC (Tarmac America, Inc.)	Stone	Do.
Calcite Operation	Michigan	Oglebay Norton Co. (Michigan Limestone Operations)	do.	Do.
Clinton Plant	New York	Oldcastle Inc./Materials Group	do.	Do.
Crushed Limestone Operation	Missouri	Tower Rock Stone Co.	do.	Do.
Reed Quarry	Kentucky	Vulcan Materials Co.	do.	Do.
Stoneport Quarry	Michigan	Lafarge North America Inc.	do.	Do.
IMC-Carlsbad	New Mexico	IMC Kalium Ltd.	Potash	Stoping.
McCook 378	Illinois	Vulcan Materials Co.	Stone	Open quarry.
Thorton	do.	General Dynamics Corp.	do.	Do.
OMYA CA Inc.	California	Pluess-Stauffer (CA) Ind., Inc.	do.	Do.
Alico Road Quarry	Florida	Rinker Materials Corporation	do.	Do.
TXI-Midlothian Cement Plant	Texas	TXI Operations, L.P.	do.	Do.
GKK Mines	Florida	Palm Beach Aggregates	do.	Do.
Haverstraw Quarry	New York	Oldcastle Inc./Materials Group	do.	Do.
Servtex	Texas	Hanson Building Materials America	do.	Do.
New Braunfels	do.	Cemex, Inc.	do.	Do.

¹Owing to commodity reporting differences, the rank of individual mining operations may not be available.

²Includes Battle Mountain Gold, Carlin Mines Complex, Lone Tree, Twin Creeks, and Reona.

TABLE 6
MARKETABLE PRODUCT AND ORE TREATED OR SOLD AT SURFACE AND UNDERGROUND MINES
IN THE UNITED STATES IN 2002, BY SELECTED COMMODITY AND STATE¹

(Thousand metric tons)

Type of ore or State	Marketable product			Ore treated or sold		
	Surface	Underground	Total	Surface	Underground	Total
Metal ore:						
Gold	W	W	W	191,000	7,080	198,000
Iron ore, usable	51,500	--	51,500	167,000	--	167,000
Zinc	844 ²	W	844	8,960 ³	W	8,960
Industrial minerals:						
Barite	W	--	W	793	--	793
Clays	39,400 ²	W	39,400	39,400 ³	W	39,400
Diatomite	624	--	624	1,320	--	1,320
Feldspar ⁴	1,240	--	1,240	1,700	--	1,700
Gypsum	12,900	1,580	14,500	13,200	1,580	14,700
Magnesium compounds	241	--	241	W	--	W
Perlite	521	--	521	547	--	547
Phosphate rock	36,100	--	36,100	154,000	--	154,000
Pumice ⁵	956	--	956	1,260	--	1,260
Salt	W	36,500 ⁶	36,500	W	38,000 ⁷	38,000
Sand and gravel:						
Construction	1,130,000	--	1,130,000	1,130,000	--	1,130,000
Industrial	27,200 ²	W	27,200	27,200 ³	W	27,200
Soda ash	--	10,500	10,500	--	10,500	10,500
Stone:						
Crushed	1,460,000	60,000	1,520,000	1,460,000	60,000	1,520,000
Dimension	1,260 ²	W	1,260	1,260 ³	W	1,260
Talc and pyrophyllite	838 ²	W	838	838 ³	W	838
Tripoli	67	--	67	68	--	68
State:						
Alabama	60,400 ²	W	60,400	60,400 ³	W	60,400
Alaska	18,400 ²	W	18,400	36,700 ³	W	36,700
Arizona	W	W	W	W	W	W
Arkansas	42,000 ²	W	42,000	42,000 ³	W	42,000
California	227,000 ²	W	227,000	251,000 ³	W	251,000
Colorado	56,900 ²	W	56,900	71,000 ³	W	71,000
Connecticut	18,400	--	18,400	18,400	--	18,400
Delaware	2,190	--	2,190	2,190	--	2,190
Florida	153,000	--	153,000	273,000	--	273,000
Georgia	86,100	1,060	87,200	86,700	1,060	87,800
Hawaii	6,990	--	6,990	6,990	--	6,990
Idaho	23,600 ²	W	23,600	W	W	W
Illinois	101,000	11,500	112,000	101,000	11,500	112,000
Indiana	84,400 ²	W	84,400	84,400 ³	W	84,400
Iowa	46,200	6,550	52,700	46,200	6,550	52,700
Kansas	32,500	2,860	35,400	32,500	2,860	35,400
Kentucky	45,700	15,500	61,200	45,700	15,500	61,200
Louisiana	25,800	--	25,800	26,400	11,900	38,300
Maine	13,700	--	13,700	13,700	--	13,700
Maryland	40,000 ²	W	40,000	40,000 ³	W	40,000
Massachusetts	26,100	--	26,100	26,100	--	26,100
Michigan	134,000	1,410	136,000	159,000	1,670	161,000
Minnesota	94,100	--	94,100	186,000	--	186,000
Mississippi	17,800	--	17,800	17,800	--	17,800
Missouri	82,300	4,450	86,700	82,300	8,740	91,000
Montana	19,700 ²	W	19,700	25,700 ³	W	25,700
Nebraska	20,300 ²	W	20,300	20,300 ³	W	20,300
Nevada	47,000 ²	W	47,000	204,000 ³	W	204,000
New Hampshire	13,300	--	13,300	13,300	--	13,300
New Jersey	38,000	--	38,000	38,000	--	38,000
New Mexico	W	W	W	W	W	W
New York	91,800 ²	W	91,800	86,300	5,750	92,000
North Carolina	80,400	--	80,400	85,400	--	85,400

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 2002, BY SELECTED COMMODITY AND STATE¹

(Thousand metric tons)

Type of ore or State	Marketable product			Ore treated or sold		
	Surface	Underground	Total	Surface	Underground	Total
State--Continued:						
North Dakota	10,900	--	10,900	10,900	--	10,900
Ohio	127,000 ²	W	127,000	127,000 ³	W	127,000
Oklahoma	60,400 ²	W	60,400	60,400 ³	W	60,400
Oregon	40,000	--	40,000	40,600	--	40,600
Pennsylvania	118,000	3,500	122,000	118,000	3,500	122,000
Rhode Island	3,700	--	3,700	3,700	--	3,700
South Carolina	38,300	--	38,300	38,300	--	38,300
South Dakota	19,000	--	19,000	24,100 ³	W	24,100
Tennessee	66,300 ²	W	66,300	68,600 ³	W	68,600
Texas	202,000	8,260	210,000	202,000	8,440	211,000
Utah	39,000 ²	W	39,000	83,900 ³	W	83,900
Vermont	9,630 ²	W	9,630	9,630 ³	W	9,630
Virginia	71,400	--	71,400	74,200	--	74,200
Washington	57,400	--	57,400	57,400	194	57,600
West Virginia	14,400	2,980	17,300	14,400	2,980	17,300
Wisconsin	77,000	--	77,000	77,000	--	77,000
Wyoming	16,200	8,940	25,100	16,200	8,940	25,100

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

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

²Includes marketable product from underground operations.

³Includes ore treated at underground operations.

⁴Includes aplite.

⁵Excludes volcanic cinder and scoria; included with crushed and broken stone.

⁶Includes marketable product from surface operations.

⁷Includes ore treated at surface operations.

TABLE 7
 MINING METHODS USED AT SURFACE OPERATIONS
 IN THE UNITED STATES, BY COMMODITY, IN 2002

(Percentage of total material handled)

Type of ore and commodity	Preceded by drilling and blasting	Not preceded by drilling and blasting ¹
<u>Metal ore:</u>		
Beryllium	100	--
Copper	100	--
Gold	95	5
Gold-silver	100	--
Iron	93	7
Magnesium metal	96	4
Molybdenum	100	--
Rare-earth metals	100	--
Silver	100	--
Titanium	--	100
Uranium	--	100
Zinc	100	--
<u>Industrial minerals:</u>		
Abrasives	100	--
Asbestos	--	100
Barite	2	98
Boron minerals	99	1
Bromine	--	100
Clays	--	100
Diatomite	--	100
Emery	100	--
Feldspar ²	54	46
Garnet	42	58
Greensand marl	--	100
Gypsum	98	2
Iodine	--	100
Iron oxide pigments	--	100
Kyanite	100	--
Lithium minerals	--	100
Magnesite	100	--
Magnesium compounds	--	100
Mica, scrap	2	98
Olivine	58	42
Perlite	20	80
Phosphate rock	2	98
Potash	--	100
Pumice ³	53	47
Salt	--	100
<u>Sand and gravel:</u>		
Construction	--	100
Industrial	--	100
<u>Stone:</u>		
Crushed	98	2
Dimension	--	100
Talc and pyrophyllite	90	10
Tripoli	97	3
Vermiculite	66	34
Wollastonite	100	--
Zeolites	100	--

-- Zero.
¹Includes drilling and cutting without blasting, dredging, mechanical excavation and nonfloat washing, and other surface mining methods.

²Includes aplite.

³Excludes volcanic cinder and scoria; included with crushed and broken stone.

TABLE 8
EXPLORATION ACTIVITY IN THE UNITED STATES IN 2002, BY METHOD, COMMODITY, AND STATE¹

(Meters)

Commodity or State	Method of exploration				Total
	Churn drilling	Diamond drilling	Rotary and reverse circulation drilling	Percussion drilling, other drilling, and trenching	
Commodity:					
Gold	61,600	117,000	333,000	W	511,000
Other ²	(3)	35,800	(3)	374,000	410,000
Total	61,600	153,000	333,000	374,000	921,000
Percentage of total	6.7	16.6	36.1	40.6	100
State:					
Alaska	61,600	33,200	--	--	94,800
Nevada	--	(3)	333,000	W	333,000
Washington	--	19,600	--	--	19,600
Undistributed ⁴	(3)	100,000	(3)	374,000	474,000
Total	61,600	153,000	333,000	374,000	921,000

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

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

²Includes boron minerals, copper, iron, molybdenum, nickel, perlite, pumice, silver, uranium, zinc, zircon, and commodities indicated by symbol W.

³Withheld to avoid disclosing company proprietary data; included with "Percussion drilling, other drilling, and trenching."

⁴Includes Arizona, California, Colorado, Florida, Idaho, Michigan, Minnesota, Montana, Nebraska, Oregon, Tennessee, Utah, Wyoming, and States indicated by symbol W.