Sand and Gravel

By Walter Pajalich [1]

Sand and gravel production decreased about 1% to 913 million short tons. The value of production increased about 4%. Output from commercial operations was 86% of the total output, while Government-and-contractor production was 14%. The production of sand and gravel in the Nation's leading State, California, increased from 115 million short tons in 1971 to 117 million short tons in 1972.

DOMESTIC PRODUCTION

California, with 117 million tons, ranked first in sand and gravel output and produced about twice as much as second-ranked Michigan. Other States producing substantial quantities of sand and gravel in descending order of production were Ohio, Illinois, Minnesota, Wisconsin, and Texas. Combined production from the seven leading States was 369 million tons, about 40% of the total U.S. output. The value of sand and gravel produced in these seven States was $471 million, 39% of the Nation's total. The number of commercial operations continued to decline from 5,738 in 1971 to 5,384 in 1972.

Factors, which have added to the consumer cost of sand and gravel, included increased labor costs, growing land values, cost of land rehabilitation, longer haulage distances, which increase transportation cost, and the need to produce from lower quality deposits as better ones become depleted or covered by urban expansion.

There were 4,286 commercial operations with production under 200,000 tons per year. These operations accounted for 30% of the total U.S. production. There were 751 operations with production between 200,000 and 500,000 tons, and they accounted for 30% of production. The remaining 347 operations with production over 500,000 tons, accounted for 40% of production.

The use of larger operating units, more efficient portable and semiportable plants, versatility of plant capacity, and greater awareness of pollution control and land rehabilitation were the keynote of progress in 1972.

Anchorage Sand & Gravel Co.'s new plant in Alaska, has a 10-year supply of sand and gravel from several pits in the area. The 400- to 500-ton-per-hour plant has the versatility of making marketable products from a variety of sources. The plant is highly automated with a central console control for the entire operation.[2]

Ohio Gravel Co., Division of Dravo Corp. opened a new 900-ton-per-hour plant at Newton, Ohio. The operation is automated and controlled from a central console. It is monitored by a closed-circuit TV system and coordinated through use of a UHF radio communications system. The stockpile storage area will hold up to 200,000 tons of material. The 75-acre mining property is under lease and is estimated to contain about 5.5 million tons of sand and gravel reserves. The property is on the perimeter of land owned by Dravo Corp. Sand and gravel mined on the property is hauled to the plant on a 2½-mile off-highway road.[3]

Consolidated Rock Co. began working a sand and gravel property at Irwindale, Calif. The deposit is located on the alluvial fan at the mouth of the San Gabrial River. The plant is automated and has a 2,400-ton-per-hour capacity.[4]

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[1] Mining Engineer, Division of Nonmetallic Minerals—Mineral Supply.

[2] Pit & Quarry. New Alaskan Gravel Plant Uses Modern Methods—Equipment. V. 64, No. 12, June 1972, pp. 81–82.

[3] Levine, Sidney. Ohio Gravel Replaces Multi-Unit Complex With 900-tph Plant. Rock Products, v. 75, No. 9, September 1972, pp. 74–77.

[4] California Geology. A Publication of the California Division of Mines and Geology. V. 25, No. 10, October 1972, pp. 233–234.

Table 1.—Sand and gravel sold or used by producers in the United States,[1] by class of operation and use

(Thousand short tons and thousand dollars)

Class of operation and use	1971 Quantity	1971 Value	1972 [2] Quantity	1972 [2] Value
Construction:				
Building:				
Sand	177,664	225,278	187,794	248,238
Gravel	145,202	218,046	153,254	237,914
Paving:				
Sand	134,311	152,747	131,402	157,427
Gravel	311,467	357,278	280,159	335,201
Fill:				
Sand	46,647	26,904	48,567	32,626
Gravel	35,093	23,382	43,458	29,913
Railroad ballast:				
Sand	1,869	2,224	1,045	1,186
Gravel	2,347	2,570	2,229	2,332
Other:				
Sand	14,103	18,220	9,575	10,290
Gravel	14,590	18,271	12,880	14,247
Total construction [3]	883,291	1,044,916	870,363	1,069,374
Industrial sand:				
Unground:				
Glass	9,683	36,445	10,828	41,259
Molding	7,302	21,763	7,522	24,827
Grinding and polishing	243	688	262	731
Blast sand	892	5,361	1,072	6,278
Fire or furnace	257	680	703	2,243
Engine	708	1,685	601	1,387
Filtration	200	612	234	1,176
Oil hydrofrac	302	1,883	282	1,071
Other	4,664	9,365	3,514	11,868
Total [3]	24,248	78,483	25,018	90,840
Ground sand [4]	1,911	12,893	4,512	21,546
Total industrial [3]	26,161	91,371	29,530	112,386
Miscellaneous gravel	10,142	12,682	13,482	17,759
Grand total [3]	919,593	1,148,969	913,375	1,199,520
Commercial:				
Sand	362,607	480,713	378,512	537,830
Gravel	409,773	527,032	407,276	550,121
Government-and-contractor: [5]				
Sand	38,151	36,037	29,402	24,324
Gravel	109,063	105,194	98,185	87,245

[1] Excludes American Samoa and Puerto Rico.
[2] Data not directly comparable with previous years because of changes in industry coverage.
[3] Data may not add to totals shown because of independent rounding.
[4] See table 10 for use breakdown.
[5] Approximate figures for operations by States, counties, municipalities, and other Government agencies under lease.

Victory Sand and Concrete, Inc.'s, new 250-ton-per-hour aggregate plant started operating in June. Sand and gravel is dredged from the Kansas River at Topeka, Kan. Although most of the production will go to the related company May-Ransom-Sheetz, Contractors, Inc., some of the material will be available for commercial sale. The plant has liquid-solids separation equipment, which includes screening units, dewatering screws, and an automatic sand-classifying tank.[5]

A new sand dredging operation near Clermont, Fla., has been started by WSW Mining Co., Inc. The plant has a 550-ton-per-hour capacity. Reserves are estimated at 35 million tons.[6]

The new 385-ton-per-hour sand plant of Brown Brothers Sand Co., Howard, Ga., is supplying sand for concrete, mortar, and special uses as far as 200 miles away. The plant consists of a dredge, scalping screen, washing bins, surge tank, two sand pumps, and four hydrocyclones.[7]

Owens-Illinois sand processing plant in Trampas Canyon east of San Juan Capistrano, Calif., went into production. Products are glass sand, with both amber and flint grades produced.

[5] Levine, Sidney. Automatic Sand Classifier Processes Aggregate. Rock Products, v. 75, No. 9, September 1972, pp. 64–66.
[6] Pit & Quarry. V. 65, No. 2, August 1972, p. 20.
[7] Trauffer, Walter E. A New 386-tph Georgia Sand Plant. Pit & Quarry, v. 65, No. 4, October 1972, pp. 117–120.

The You Bet White Co. is mining the high-grade (99.6% SiO_2) Bear River stream gravels below Rollins Reservoir east of Colfax, Calif. The gravel is crushed to minus 350 mesh and sold in the Sacramento area for use as an abrasive in the manufacture of scouring powder. Part of the production is shipped by rail to Oregon for use in silicon carbide manufacture.[8]

About 400 billion tons of commercially significant sand occurs in the upper 10 feet of the ocean floor off the northeastern coast of the United States. These large deposits have immediate useful potential for this part of the country and can also supply some of the eastern Provinces of Canada.[9]

[8] Work cited in footnote 4.
[9] Manheim, Frank T. Mineral Resources off the Northeastern Coast of the United States. U.S. Geol. Survey Cir. 669, 1972, 27 pp.

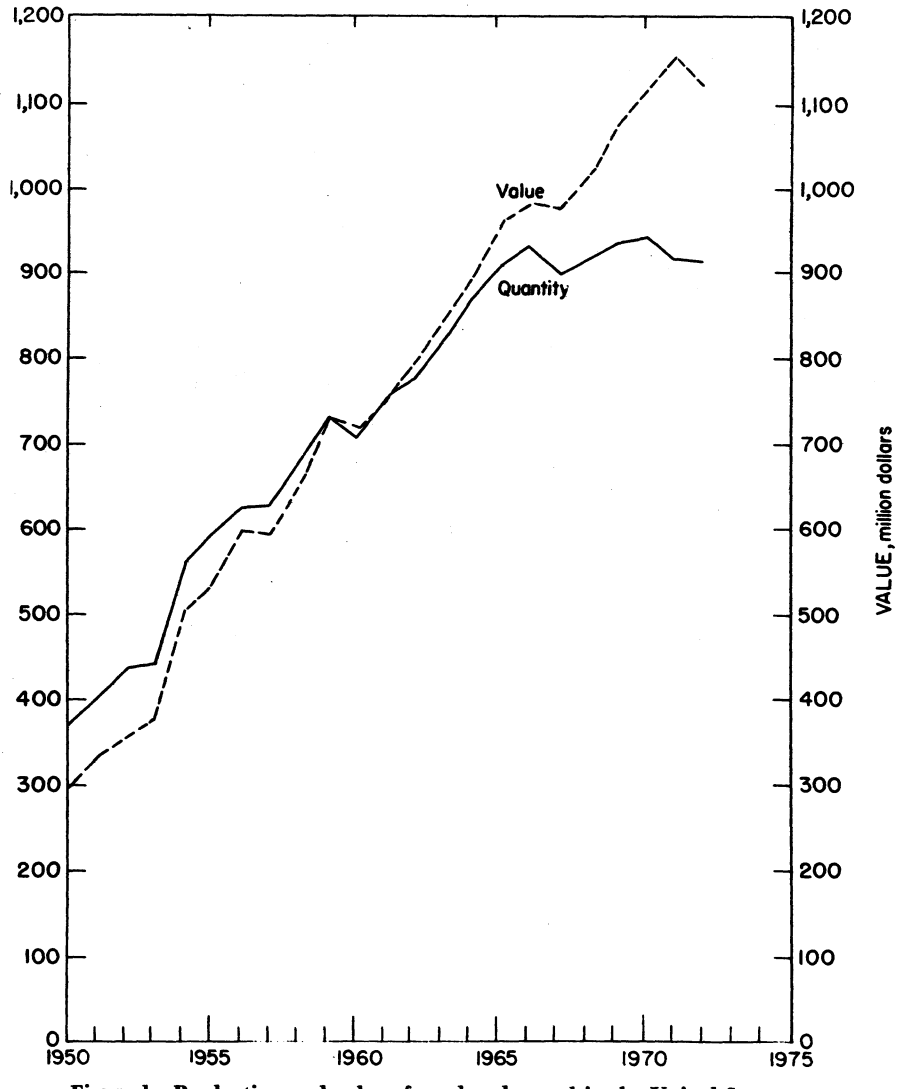

Figure 1.—Production and value of sand and gravel in the United States.

CONSUMPTION AND USES

In 1972, U.S. consumption of sand and gravel amounted to 913 million tons valued at $1.2 billion. The construction industry, the prime user of sand and gravel, consumed 95% of the tonnage. This was 89% of the value of the sand and gravel output in 1972. Of the amount of sand and gravel consumed by the construction industry, 47% went into paving, 39% into building, about 11% into fill, and 3% into other uses. The principal consumers of higher priced industrial sand were the glass and foundry industries.

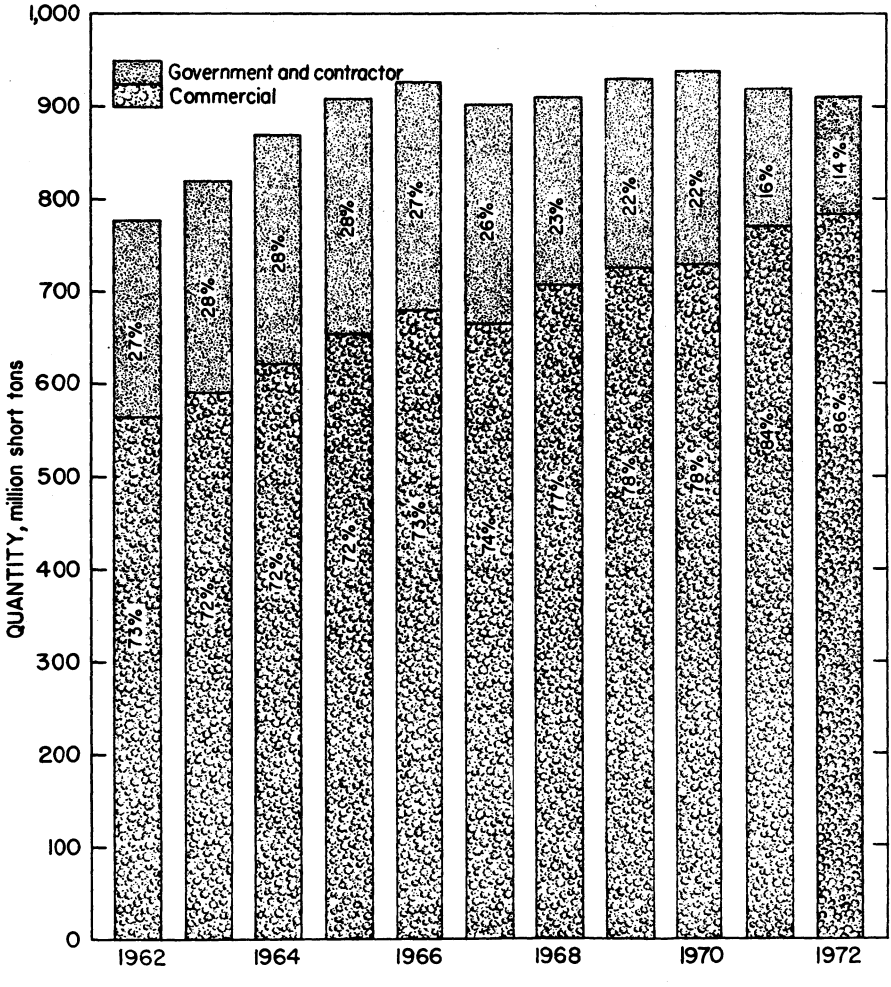

Figure 2.—Sand and gravel sold or used in the United States.

PRICES

Representative carload-lot prices of sand in 19 cities at the end of 1972 ranged from $1.05 per ton in Detroit to $5.40 per ton in Pittsburgh, according to the Engineering News-Record.[10] The average of the sand prices reported was $3.14 per ton, compared with $3.23 per ton in 1971. Prices for either ¾- or 1½-inch gravel ranged from $1.60 per ton in Birmingham to $7 per ton in New Orleans. The average of the ¾-inch gravel prices reported for 20 cities was $3.80 per ton, compared with $3.67 per ton in 1971. For 1½-inch gravel, the average for 18 cities was $3.74 per ton compared with $3.48 per ton in 1971.

The average price of sand in Montreal and Toronto, Canada, at the end of 1972 was $2.30 per ton; ¾-inch gravel was $2.43 per ton, and 1½-inch gravel was $2.35 per ton.

Based on the Bureau of Mines canvass, the average value of sand and gravel sold or used by producers, f.o.b. plant, was $1.31 per ton; the comparable value in 1971 was $1.25 per ton.

FOREIGN TRADE

Canada received 79% of U.S. exports of construction sand, the Bahamas received 20%, and Venezuela received less than 1%. The remainder went to 20 different countries. Exports of construction sand totaled 419,647 short tons, valued at $801,236. Gravel exports totaled 352,560 short tons valued at $462,514. Total exports of common sand and gravel were 772,207 short tons, valued at $1,263,750. Canada received 78% of U.S. exports of common sand and gravel, the Bahamas received 12%, and Mexico received 8%. Of U.S. exports of industrial sand, which amounted to 1,048,775 short tons valued at $5,944,231, Canada received 74%, Mexico 13%, and Colombia about 4%. The remainder went to 59 different countries.

Most of the crude sand and gravel imported in 1971 was from Canada. Almost all of the imported glass sand was from Australia.

WORLD REVIEW

Belgium.—About 90% of Belgian sand and gravel was extracted in the Limburg Province along the River Meuse. The depths of the deposits vary between 30 and 60 feet. Additional sand and gravel was dredged from the River Meuse, where the ratio of gravel to sand was 4:1. In 1972, Belgium produced about 15 million tons of sand and gravel.

Canada.—It has been estimated that aggregate consumption in some Canadian urban centers was about 5.4 tons per person. Consumption is expected to reach 18 tons per person by 1980. Construction activity, particularly heavy or engineering construction, regulates the production of sand and gravel in Canada. The upward trend in production peaked in 1966 to 1967 with the large demand for construction materials related to Expo '67. In the post-Expo years demand decreased and has stabilized to a more normal annual increment of increase. Total sand and gravel production for 1971 was estimated at 201 million tons valued at $134 million. The largest production of 85 million tons was in Ontario province followed by 37 million in Quebec.[11]

A recent survey by the Aggregate Producers Association of Ontario indicated that transportation costs to the consumer represented approximately 60% of the f.o.b. pit selling price of the product. For each mile sand and gravel products are hauled an additional 5 cents per ton was required. The f.o.b. pit selling price ranges from 50 cents to $1.25 per ton. Trucks move 95% of the total production. When the product was moved 5 miles from the source, the transportation cost represented approximately 30% of the total market value, and 40% when the distance was more than 20 miles.[12]

France.—Sand and gravel is found throughout France. Main areas of concen-

[10] Engineering News-Record, McGraw-Hill Construction Weekly, Dec. 7, 1972, pp. 50–51.
[11] Stonehouse, D. H. Sand and Gravel. Canadian Mineral Yearbook Preprint, No. 38, 1971.
[12] Yundt, Sheralyn E. Sand and Gravel Transportation in Ontario. Cement Lime and Gravel, v. 47, No. 9, September 1972, pp. 204–205.

tration are in the large valleys of the Seine, Rhone, Loire, and Rhine Rivers. There were about 1,500 producers of sand and gravel in France, many of whom are located in the Seine Valley. The 150 largest producers provide 60% of the national production. The average price f.o.b. plant ranges from $1 to $1.25 per ton of sand and gravel.

Laws that governed the sand and gravel industry dated back to the time of Napoleon I, however in 1970 these laws were changed. Authorization to mine sand and gravel now must include detailed information about the deposit, method of operation, and land restoration.

Although the French Continental Shelf is known to contain large sand and gravel reserves there is little dredging of these deposits. Only 1% of the country's consumption of about 190 million tons of sand and gravel comes from dredging operations.[13]

United Kingdom.—Three new plants have gone into production for Blue Circle Aggregates, Ltd. Located at Elford near Tamworth Staffs, Huntley Wood near Cheadle Staffs, and Repton near Burton on Trent Staffs, these plants will serve the Midland market. They have been designed with up-to-date control, instrumentation, and closed-circuit TV, which enables them to operate with the minimum of personnel. Each plant is capable of producing 10,000 tons of aggregates per week.[14]

The new Parker sand and gravel plant at Chard went into operation after the 40-year-old plant at the site was dismantled. The firm of J. R. Pratt and Son, Ltd., owners of the old and new plants have been in business for over 50 years. The new plant was designed to produce 100 tons per hour.[15]

Near the village of Thurlby Butterley, Blue Circle Aggregates, Ltd., has started dredging a new sand and gravel deposit. A floating pontoon with a 10-inch pump driven by a 370-horsepower diesel engine delivers the material directly to the plant through a floating pipeline. Operating capacity is 120 tons per hour.[16]

In the United Kingdom, production of sand and gravel is usually exceeded only by that of coal. Sand and gravel production in 1972 was about 130 million tons, most of which came from land-based operations. Offshore production began to increase in the 1960's as the demand for materials increased and dredged materials became more competitive. There are at least 15 companies operating between 60 and 70 sand and gravel dredging vessels of varying capacities. About 10% or 13 million tons of sand and gravel was produced by dredging. About one-quarter of the dredged material was exported to the Continent.

Until 1966, production of sand and gravel was greater than crushed stone. In 1972 crushed stone production was about 140 million tons. At present rates of growth, limestone alone is expected to exceed the production of natural sand and gravel by 1974. Much of the future of sand and gravel production will depend on present land restoration methods that will almost certainly govern future release of land for sand and gravel extraction.

TECHNOLOGY

Airborne resistivity mapping known as E-Phase has been developed by Barringer Research, Inc., for mapping sand and gravel deposits. The systems sensing method measures resistivity of the upper 10 to 150 feet of surface. Resistivity airborne surveys allow complete and quick coverage of land that may not be traversed on the ground because of terrain problems or urbanization.[17]

At the Plastic Disposal Research Institute, Funabashi, Japan, a system of converting plastic waste into pavement material was developed. The plastic waste is crushed into small pieces, melted, and the poisonous gas removed. The pieces are then pelletized and passed through a water tank and turned into artificial gravel.[18]

[13] Bourgeois, R. The Sand and Gravel Industry in France. Cement Lime and Gravel, v. 47, No. 9, September 1972, pp. 197–199.

[14] Rock Products. Three U. K. Aggregate Plants Go Onstream. V. 75, No. 6, June 1972, pp. 65–68.

[15] Cement Lime and Gravel. New Sand and Gravel Plant. V. 47, No. 5, May 1972, pp. 106–110.

[16] Cement Lime and Gravel. Dredging a Trent Valley Gravel Deposit. V. 47, No. 1, November 1972, pp. 247–250.

[17] Pit & Quarry. Sand and Gravel Deposits Mapped by Aerial Technique. V. 65, No. 1, July 1972, pp. 79–80.

[18] The Evening Star and Daily News, Washington, D.C. Tuesday, Nov. 14, 1972, p. A-3.

Dramatic upgrading of low-grade sand and gravel has been reported by Young's Sand and Gravel Co., Loudonville, Ohio. Designated as the Rib-O-Matic, the new process uses a horizontal circular plate that supports a bed of material to which crushing and kneading forces are applied by six sets of rubber wheels or rollers. The crushing effect between the wheels and bed of material crushes, then pulverizes, the unsound aggregate while scouring and cleaning the sound aggregate.[19]

Williamstown, Mass., became the first town in New England to pave a road with a mixture of reclaimed rubber and asphalt. The 400-foot section of road was paved with "Ramflex," manufactured by U.S. Rubber Reclaiming Co. About 30 reclaimed tires went into the 1½ inches of asphalt mixture laid down on this stretch of road.

The Pennsylvania Department of Transportation completed 1.8 miles of test paving on high-speed U.S. Route 322 between Harrisburg and Hershey. The material used was a German-originated mastic asphaltic compound, Gussaphalt, which has been successfully used on more than 1,500 miles of prime Autobahn roads in West Germany, and in other European locations, for more than 15 years. The higher cost of this material versus U.S. asphalt pavement reputedly is compensated for by longer life, low maintenance costs, and the ability to carry traffic as soon as it cools. It can be laid in subfreezing temperatures and is highly skid resistant. The compound embodies the use of native lake asphalt, which holds colloidal material in suspension, a property not present in petroleum asphalt. The asphaltic mixture is combined with limestone, sand, and 1-B stone at the originating plant and then transported to the construction site at a maintained temperature of 410 to 450 degrees fahrenheit. A crimper-spiked roller makes a waffle-like pattern in the surface of the finished pavement, which adds to its skid resistance.

New dredge designs have been developed for the hydraulic and bucket-line ladder dredges enabling them to operate in greater water depths than before. Also economical construction of larger dredges is now possible. Some of the new features allow hydraulic ladder dredges to dredge 300 feet or more and bucket-line ladder dredges to dig 200 feet or more below the water level surface. The improved design allows for operation under sea wave and swell conditions, lower ratio dredge displacement weight to capacity, and increased dredge efficiency and production. Design changes include the use of a multiple section articulated ladder, which may comprise two or more ladder sections, and a new principle of compensating for sea and wave swell conditions.

Dust control received considerable attention last year. In most sand and gravel operations, dust suppression is a problem. Suppression can be achieved by confinement of the dust with a curtain of moisture, direct wetting of the dust, or the combining of dust particles with each other by the use of a liquid spray, thus making the dust particles too heavy to become airborne or to remain airborne. Another system of control is the collection of dust or fines. Chemicals are often added to water to increase its wetting capability.

The Conrock Co. of California has embarked on a full scale dust control program for their production facilities, stockpiles, and roads. The program uses the dust control chemical Coherex in a 1 to 10 part water ratio.[20]

The Hills Materials Co., Rapid City, S. Dak., uses a cyclone dust collector. This resulted in a bag collection of fines that are sold as mineral filler.[21]

The Construction Aggregates Rail Shippers (CARS) Conference study on aggregate shipments by rail, done by A. T. Kearney & Co. Inc., issued its first report. The study found some of the reasons why it is generally unprofitable to move aggregates by rail and made a series of recommendations to aggregate producers and receivers on how they can help the railroads alleviate some of the problems. Most of the recommendations are directed at reducing costs of rail transportation. CARS was organized in 1969 through the sponsorship of the National Crushed Stone Assoc., National Limestone Institute, Na-

[19] Roads and Streets Highway/Heavy Construction. New Weapon in Attack on Marginal Aggregates. V. 115, No. 7, July 1972, pp. 27–28.

[20] Pit & Quarry. Conrock Controls Fugitive Dust Efficiently and Economically. V. 65, No. 3, September 1972, p. 27.

[21] Roads & Streets Highway/Heavy Construction. Asphalt Plant Solves Dust Problem, Makes Valuable By-product. V. 115, No. 7, July 1972, pp. 97–101.

tional Sand and Gravel Assoc., and the National Slag Assoc.[22]

The Soviets have developed a liqiud sand process for ingot mold and steel castings. The mixture can be poured readily into core boxes or molds in which it hardens without any external action such as gassing or drying. Liquid sands are created by adding small amounts of surface acting agents to insure intensive foam-formation as sand and bonding material are mixed together. The mixing changes the plastic state of the material into a state whereby the mixture behaves like a liquid. Self-setting is due to the addition of some solidifying agent that reacts with the bonding material. A variety of sand mixes have been developed. One widely used in steel and iron foundry work is silica sand, with sodium silicate as the bonding material, alkilaril-sulfonates (mostly petroleum sulfoacids) as the surface active mixture, and ferro-chromium production slag containing dicalcium silicate as the setting agent.[23]

[22] CARS Report, V. I and II. Prepared by A. T. Kearney & Co., for The Construction Aggregates Rail Shippers Conf., 1415 Elliot Place, NW., Washington, D.C. 20007.

[23] Foundry. Preparing Liquid Sand Mixes. V. 100, No. 9, September 1972, pp. 82–84.

Table 2.—Sand and gravel sold or used by producers in the United States [1]

(Thousand short tons and thousand dollars)

Year	Sand		Gravel		Total [2]	
	Quantity	Value	Quantity	Value	Quantity	Value
1968	369,221	433,088	548,247	587,019	917,468	1,020,107
1969	380,878	465,843	556,291	603,826	937,169	1,069,667
1970	383,378	484,722	560,563	630,985	943,941	1,115,705
1971	400,759	516,749	518,833	632,226	919,593	1,148,969
1972 [3]	407,914	562,154	505,461	637,366	913,375	1,199,520

[1] Excludes American Samoa and Puerto Rico.
[2] Data may not add to totals shown because of independent rounding.
[3] No sand and gravel production in American Samoa in 1972. Data not directly comparable with previous years because of changes in industry coverage.

Table 3.—Sand and gravel sold or used by producers in the United States, by State and class of operation

(Thousand short tons and thousand dollars)

State	1971						1972					
	Commercial		Government-and-contractor		Total [1]		Commercial		Government-and-contractor		Total [1]	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Alabama	6,655	7,466	19	48	6,674	7,513	6,352	8,530	--	--	6,352	8,530
Alaska	3,618	4,321	19,999	28,484	23,617	32,806	4,252	4,183	9,936	11,031	14,187	15,214
Arizona	17,210	21,766	2,581	2,624	19,791	24,391	22,619	29,131	2,223	3,290	24,842	32,420
Arkansas	9,850	13,993	1,779	1,611	11,630	15,603	10,004	15,045	1,571	1,514	11,574	16,558
California	104,220	142,279	11,248	15,404	115,468	157,683	104,419	154,544	12,869	8,075	117,288	162,619
Colorado	19,145	24,873	7,854	5,283	27,000	30,155	22,211	30,285	6,106	4,346	28,318	34,631
Connecticut	6,566	9,815	355	447	6,921	10,262	5,924	9,560	839	1,710	6,763	11,270
Delaware	2,205	2,231	--	--	2,205	2,231	2,257	2,660	--	--	2,257	2,660
Florida	22,915	18,666	314	169	23,228	18,836	20,707	14,979	45	45	20,752	15,025
Georgia	3,697	5,310	--	--	3,697	5,310	3,816	4,729	--	--	3,816	4,729
Hawaii	836	1,967	--	--	836	1,967	584	1,890	25	3	609	1,893
Idaho	4,404	6,421	6,876	5,016	11,279	11,437	3,825	5,896	3,871	4,398	7,696	10,294
Illinois	44,827	58,907	536	490	45,364	59,397	39,533	61,328	397	368	39,929	61,696
Indiana	23,689	28,326	1,293	767	24,982	29,094	26,652	32,348	1,326	943	27,978	33,290
Iowa	16,954	19,216	1,325	1,314	18,279	20,530	15,772	19,064	1,335	1,076	17,107	20,140
Kansas	10,056	9,991	1,807	1,361	11,862	11,351	9,265	9,588	2,326	1,333	11,591	10,920
Kentucky	8,031	11,023	171	37	8,202	11,061	8,321	11,919	163	48	8,485	11,967
Louisiana	18,823	23,861	405	631	19,228	24,492	18,538	26,255	383	740	18,920	26,996
Maine	3,865	4,210	4,427	1,671	8,292	5,881	4,126	4,394	7,692	3,140	11,818	7,535
Maryland	12,730	23,185	112	16	12,842	23,201	12,426	26,517	167	40	12,594	26,557
Massachusetts	14,938	20,872	2,404	2,186	17,343	23,058	16,568	23,782	2,315	1,873	18,883	25,655
Michigan	51,356	59,047	5,257	3,851	56,613	62,898	54,683	63,646	4,784	1,799	59,467	65,445
Minnesota	35,936	33,113	8,989	4,532	44,916	37,645	30,451	29,972	6,341	3,482	36,792	33,454
Mississippi	11,234	13,413	55	114	11,289	13,526	13,295	15,867	124	266	13,419	16,133
Missouri	10,263	15,031	64	78	10,327	15,109	10,068	14,779	14	27	10,082	14,806
Montana	1,909	2,244	13,872	22,963	15,781	25,207	2,138	3,022	7,977	14,126	10,116	17,149
Nebraska	12,575	13,218	649	408	13,224	13,626	12,317	13,376	1,403	1,688	13,720	15,063
Nevada	6,508	10,191	2,871	2,034	9,379	12,225	7,722	10,691	2,359	1,945	10,081	12,636
New Hampshire	6,174	6,132	2,230	644	8,404	6,777	4,815	5,951	1,204	305	6,020	6,256
New Jersey	18,505	38,275	7	4	18,511	38,279	17,666	38,010	13	11	17,679	38,020
New Mexico	7,573	6,374	1,296	1,601	8,869	7,975	5,609	6,894	1,991	1,659	7,600	8,553
New York	21,284	27,678	1,937	650	23,221	28,328	24,594	36,321	2,128	631	26,722	36,952
North Carolina	10,191	13,306	4,049	1,385	14,240	14,690	10,072	13,203	3,413	1,413	13,485	14,615
North Dakota	6,053	5,251	2,144	959	8,196	6,210	4,708	4,678	1,974	1,078	6,681	5,757
Ohio	40,539	53,790	259	254	40,797	54,044	43,276	59,702	229	230	43,506	59,932
Oklahoma	4,864	7,375	849	885	5,713	8,259	7,306	10,181	595	957	7,901	11,138
Oregon	16,875	23,978	3,355	4,729	20,230	28,707	20,736	30,462	3,753	4,519	24,489	34,981
Pennsylvania	19,668	36,162	--	--	19,668	36,162	18,757	36,804	--	--	18,757	36,804
Rhode Island	2,252	3,052	--	--	2,252	3,052	2,008	3,265	71	71	2,079	3,336
South Carolina	6,488	9,119	--	--	6,488	9,119	7,916	12,121	--	--	7,916	12,121
South Dakota	8,117	8,218	8,610	10,174	16,727	18,392	5,772	6,423	6,976	8,369	12,748	14,793
Tennessee	7,242	11,357	776	488	8,018	11,845	10,441	15,157	398	172	10,839	15,328
Texas	29,607	48,831	3,181	2,983	32,788	51,814	33,036	54,658	2,115	1,670	35,151	56,328

See footnotes at end of table.

Table 3.—Sand and gravel sold or used by producers in the United States, by State and class of operation—Continued

(Thousand short tons and thousand dollars)

State	1971						1972					
	Commercial		Government-and-contractor		Total [1]		Commercial		Government-and-contractor		Total [1]	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Utah	8,451	8,823	2,054	1,367	10,505	10,190	11,652	13,989	2,967	3,082	14,619	17,071
Vermont	2,993	3,249	768	268	3,761	3,518	2,477	3,014	825	199	3,302	3,214
Virginia	12,776	20,198	20	3	12,796	20,201	13,976	21,648	109	48	14,085	21,696
Washington	19,648	24,260	3,054	2,399	22,702	26,658	18,264	23,440	4,801	2,629	23,065	26,069
West Virginia	7,107	16,756	--	--	7,107	16,756	5,765	15,030	(2)	1	5,765	15,031
Wisconsin	26,703	26,595	11,857	6,153	38,561	32,748	24,418	24,880	12,012	6,443	36,430	31,324
Wyoming	4,307	4,006	5,513	4,744	9,820	8,750	3,678	4,142	5,419	10,774	9,098	14,916
Total [2]	772,382	1,007,741	147,212	141,229	919,593	1,148,969	785,788	1,087,951	127,587	111,569	913,375	1,199,520
American Samoa [3]	--	--	32	25	32	25						
Puerto Rico [e]	r 12,768	r 34,196	r 230	r 784	r 12,998	r 34,980	p 7,246	p 20,446	p 232	p 792	p 7,478	p 21,237

[e] Estimate. [p] Preliminary. [r] Revised.

[1] Data may not add to totals shown because of independent rounding. Data not directly comparable with previous years because of changes in industry coverage.

[2] Less than ½ unit.

[3] There was no sand and gravel production in American Samoa in 1972.

Table 4.—Sand and gravel sold or used by producers in the United States in 1972, by State, use, and class of operation [1]

(Thousand short tons and thousand dollars)

State	Sand, construction							
	Building				Paving			
	Commerical		Government-and-contractor		Commercial		Government-and-contractor	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Alabama	1,796	1,937	--	--	814	1,299	--	--
Alaska	162	294	1	(2)	W	W	2,865	2,827
Arizona	4,159	6,880	19	26	1,632	2,100	564	752
Arkansas	2,641	4,359	--	--	1,808	2,096	688	554
California	23,370	34,737	36	37	17,507	23,313	1,094	1,563
Colorado	3,832	5,732	55	116	882	1,351	316	265
Connecticut	1,365	2,308	--	--	1,596	2,717	27	29
Delaware	330	553	--	--	W	W	--	--
Florida	7,386	7,488	--	--	3,253	3,148	--	--
Georgia	3,062	2,942	--	--	W	W	--	--
Hawaii	373	1,175	--	--	W	W	--	--
Idaho	554	1,064	1	2	182	164	373	761
Illinois	6,585	7,753	(2)	(2)	7,819	8,998	42	44
Indiana	4,673	5,144	--	--	6,064	6,853	133	130
Iowa	3,023	3,704	(2)	(2)	2,787	3,675	225	262
Kansas	3,888	4,158	--	--	2,652	2,781	797	435
Kentucky	3,222	4,912	--	--	2,129	2,954	24	24
Louisiana	5,319	6,756	--	--	2,254	2,612	201	371
Maine	439	573	--	--	830	782	1,442	558
Maryland	5,231	10,510	--	--	1,343	2,907	11	2
Massachusetts	3,877	5,813	--	--	2,181	2,756	677	406
Michigan	7,862	7,571	4	1	8,772	8,960	700	213
Minnesota	5,814	5,512	3	1	2,746	2,435	311	270
Mississippi	2,627	2,989	56	86	2,003	2,137	--	--
Missouri	3,759	3,989	--	--	1,597	1,707	(2)	(2)
Montana	302	555	--	--	115	215	165	677
Nebraska	3,599	3,482	(2)	(2)	965	1,165	269	307
Nevada	945	1,454	--	--	174	218	704	759
New Hampshire	1,695	2,130	--	--	383	407	189	59
New Jersey	4,832	7,425	--	--	3,440	4,358	--	--
New Mexico	1,495	2,124	--	--	323	325	67	99
New York	8,795	13,573	--	--	2,997	4,181	30	8
North Carolina	4,546	4,878	--	--	2,065	1,722	2,035	892
North Dakota	470	757	--	--	82	85	79	31
Ohio	7,158	9,519	9	13	8,765	11,080	92	101
Oklahoma	3,078	3,572	34	478	1,935	2,094	220	46
Oregon	3,030	4,514	--	--	1,914	3,307	10	15
Pennsylvania	5,164	9,265	--	--	2,441	4,649	--	--
Rhode Island	338	506	--	--	553	W	56	56
South Carolina	4,213	3,366	--	--	716	489	--	--
South Dakota	604	765	--	--	382	399	104	124
Tennessee	3,314	4,580	--	--	1,620	2,561	2	2
Texas	10,108	13,932	11	11	3,068	4,419	1,045	664
Utah	1,853	2,341	--	--	379	348	4	1
Vermont	656	857	--	--	541	485	271	71
Virginia	3,326	4,989	--	--	2,654	2,773	27	3
Washington	3,228	4,721	--	--	1,249	1,723	343	364
West Virginia	1,772	2,938	--	--	415	687	--	--
Wisconsin	4,518	4,758	2,747	1,001	2,241	2,184	1,629	712
Wyoming	427	607	2	3	W	W	2,391	5,386
Undistributed	--	--	--	--	914	1,963	--	--
Total [3]	184,818	246,461	2,976	1,777	111,184	137,582	20,218	19,845
Puerto Rico [e p]	2,323	6,071	190	644	1,147	3,052	42	148

See footnotes at end of table.

Table 4.—Sand and gravel sold or used by producers in the United States in 1972, by State, use, and class of operation [1]—Continued

(Thousand short tons and thousand dollars)

State	Sand, construction—Continued									
	Railroad ballast (commercial)		Fill				Other [4]			
			Commercial		Government-and-contractor		Commercial		Government-and-contractor	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Alabama	W	W	98	94	--	--	W	W	--	--
Alaska	--	--	569	133	8	4	(2)	W	4	11
Arizona	W	W	579	655	57	13	105	285	--	--
Arkansas	--	--	341	365	72	73	W	W	--	--
California	W	W	4,338	3,560	1,154	397	231	514	2	4
Colorado	W	W	292	326	37	39	W	W	4	2
Connecticut	--	--	251	237	12	3	206	259	14	14
Delaware	--	--	W	W	--	--	W	W	--	--
Florida	--	--	W	1,770	--	--	W	W	--	--
Georgia	--	--	23	23	--	--	W	W	--	--
Hawaii	--	--	W	W	--	--	W	W	--	--
Idaho	--	--	W	W	25	16	W	W	1	1
Illinois	--	--	2,541	2,312	36	2	317	321	--	--
Indiana	--	--	984	780	6	6	100	97	7	7
Iowa	W	W	1,231	967	--	--	564	703	3	3
Kansas	W	W	1,254	907	16	4	69	113	--	--
Kentucky	--	--	704	661	--	--	139	190	--	--
Louisiana	--	--	408	261	22	57	W	W	138	256
Maine	--	--	319	141	10	2	128	79	33	8
Maryland	--	--	133	W	--	--	1	W	--	--
Massachusetts	9	14	809	485	179	38	596	810	48	49
Michigan	--	--	2,610	1,634	849	92	433	316	109	69
Minnesota	33	29	1,053	714	369	137	411	268	139	94
Mississippi	W	19	78	72	--	--	W	W	--	--
Missouri	--	--	341	242	--	--	167	302	--	--
Montana	--	--	10	13	15	2	W	W	7	5
Nebraska	--	--	568	407	--	--	W	W	--	--
Nevada	--	--	546	397	25	25	11	14	(2)	(2)
New Hampshire	--	--	636	532	--	--	57	55	--	--
New Jersey	W	W	1,105	705	--	--	66	78	--	--
New Mexico	--	--	175	113	64	30	W	W	4	5
New York	W	38	1,396	549	36	12	483	616	427	152
North Carolina	W	W	195	148	130	19	W	W	696	210
North Dakota	--	--	302	198	84	8	W	W	--	--
Ohio	W	W	1,563	1,178	--	--	96	143	--	--
Oklahoma	--	--	1,186	599	299	401	--	--	--	--
Oregon	3	45	575	1,430	2	(2)	W	W	--	--
Pennsylvania	W	W	100	129	--	--	1,456	1,817	--	--
Rhode Island	--	--	50	W	--	--	W	W	--	--
South Carolina	W	W	147	67	--	--	W	W	--	--
South Dakota	(2)	(2)	96	45	--	--	21	W	35	25
Tennessee	--	--	97	96	--	--	W	W	--	--
Texas	W	W	2,897	3,381	2	4	W	W	--	--
Utah	--	--	114	78	84	82	276	292	12	6
Vermont	--	--	42	28	--	--	64	76	--	--
Virginia	W	W	1,912	W	51	18	38	75	(2)	(2)
Washington	--	--	892	640	(2)	(2)	W	W	43	21
West Virginia	--	--	W	W	--	--	--	--	(2)	1
Wisconsin	W	W	1,391	832	348	97	190	149	483	179
Wyoming	--	--	43	W	2	(2)	16	W	2	1
Undistributed	998	1,042	9,579	3,137	--	--	1,122	1,597	--	--
Total [3]	1,045	1,186	44,571	31,045	3,996	1,581	7,363	9,169	2,212	1,121
Puerto Rico [e p]	657	714	--	--	--	--	--	--	--	--

See footnotes at end of table.

Table 4.—Sand and gravel sold or used by producers in the United States in 1972, by State, use, and class of operation [1]—Continued

(Thousand short tons and thousand dollars)

State	Sand, industrial (Commercial)									
	Glass		Molding		Grinding and polishing		Blast sand		Fire or furnace	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Alabama	--	--	W	W	--	--	--	--	--	--
Alaska	--	--	--	--	--	--	--	--	--	--
Arizona	--	--	--	--	--	--	(2)	W	191	696
Arkansas	W	W	W	W	--	--	--	--	--	--
California	878	4,547	W	W	--	--	223	1,095	W	W
Colorado	--	--	--	--	--	--	W	W	--	--
Connecticut	--	--	--	--	--	--	--	--	--	--
Delaware	--	--	--	--	--	--	--	--	--	--
Florida	W	W	--	--	--	--	118	967	--	--
Georgia	W	W	W	W	--	--	W	W	--	--
Hawaii	--	--	--	--	--	--	--	--	--	--
Idaho	--	--	--	--	--	--	6	55	--	--
Illinois	2,367	7,330	1,362	5,668	--	--	134	W	--	--
Indiana	W	W	W	W	--	--	--	--	--	--
Iowa	--	--	--	--	--	--	W	W	--	--
Kansas	--	--	--	--	--	--	--	--	--	--
Kentucky	--	--	--	--	--	--	10	46	--	--
Louisiana	--	--	W	W	--	--	120	720	--	--
Maine	--	--	--	--	--	--	--	--	--	--
Maryland	--	--	--	--	--	--	--	--	--	--
Massachusetts	--	--	W	W	--	--	W	W	--	--
Michigan	W	W	2,909	6,694	W	W	(2)	W	W	W
Minnesota	W	W	W	W	--	--	--	--	--	--
Mississippi	--	--	W	W	--	--	--	--	--	--
Missouri	697	2,237	W	W	W	W	W	W	W	W
Montana	--	--	--	--	--	--	--	--	--	--
Nebraska	--	--	--	--	--	--	--	--	--	--
Nevada	W	W	W	W	--	--	--	--	W	W
New Hampshire	--	--	--	--	--	--	--	--	--	--
New Jersey	1,915	W	493	2,496	W	W	138	842	W	W
New Mexico	--	--	--	--	--	--	--	--	--	--
New York	--	--	W	W	--	--	--	--	--	--
North Carolina	--	--	--	--	--	--	--	--	W	W
North Dakota	--	--	171	566	--	--	W	W	W	W
Ohio	--	--	W	W	--	--	W	W	--	--
Oklahoma	W	W	W	W	--	--	--	--	--	--
Oregon	--	--	--	--	W	W	W	W	W	W
Pennsylvania	W	W	W	W	--	--	--	--	--	--
Rhode Island	--	--	W	W	--	--	37	140	W	W
South Carolina	W	W	W	W	--	--	--	--	--	--
South Dakota	--	--	181	640	W	W	--	--	W	W
Tennessee	W	W	104	345	W	W	W	W	--	--
Texas	W	W	W	W	--	--	W	W	--	--
Utah	--	--	--	--	--	--	W	W	W	W
Vermont	--	--	W	W	--	--	--	--	--	--
Virginia	W	W	--	--	--	--	--	--	(2)	(2)
Washington	53	480	--	--	W	W	W	W	--	--
West Virginia	W	W	W	W	--	--	W	W	--	--
Wisconsin	W	W	W	W	--	--	--	--	--	--
Wyoming	--	--	--	--	--	--	286	2,412	513	1,546
Undistributed	4,917	26,664	2,302	8,416	262	731	--	--	--	--
Total [3]	10,828	41,259	7,522	24,827	262	731	1,072	6,278	703	2,243
Puerto Rico [e p]	--	--	--	--	--	--	--	--	--	--

See footnotes at end of table.

Table 4.—Sand and gravel sold or used by producers in the United States in 1972, by State, use, and class of operation [1]—Continued

(Thousand short tons and thousand dollars)

State	Sand, industrial (Commercial)—Continued									
	Engine		Filtration		Oil (hydrofrac)		Other		Ground sand	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Alabama	W	W	--	--	--	--	190	404	W	W
Alaska	--	--	--	--	--	--	--	--	--	--
Arizona	--	--	(2)	(2)	W	W	W	W	W	W
Arkansas	--	--	--	--	--	--	--	--	822	4,176
California	W	W	W	W	W	W	W	W	--	--
Colorado	W	W	W	W	W	W	--	--	--	--
Connecticut	--	--	--	--	--	--	--	--	--	--
Delaware	--	--	--	--	--	--	--	--	--	--
Florida	W	W	W	W	--	--	W	W	W	W
Georgia	W	W	W	W	--	--	W	W	W	W
Hawaii	--	--	--	--	--	--	--	--	--	--
Idaho	--	--	--	--	--	--	W	W	80	740
Illinois	W	W	W	W	W	W	489	W	396	2,259
Indiana	--	--	--	--	--	--	W	W	W	W
Iowa	--	--	--	--	--	--	W	W	W	W
Kansas	--	--	--	--	--	--	W	W	11	W
Kentucky	--	--	--	--	--	--	W	W	3	13
Louisiana	--	--	--	--	--	--	--	--	--	--
Maine	3	5	--	--	--	--	W	W	--	--
Maryland	--	--	--	--	--	--	--	--	--	--
Massachusetts	--	--	W	W	--	--	26	W	W	W
Michigan	28	73	--	--	--	--	W	580	W	W
Minnesota	W	W	--	--	W	W	46	104	W	W
Mississippi	--	--	--	--	--	--	--	--	--	--
Missouri	(2)	W	4	W	W	W	W	W	W	W
Montana	--	--	--	--	--	--	W	W	--	--
Nebraska	--	--	--	--	--	--	W	W	--	--
Nevada	--	--	--	--	--	--	W	W	2	5
New Hampshire	--	--	--	--	--	--	--	--	--	--
New Jersey	25	89	W	W	--	--	453	1,944	385	2,400
New Mexico	--	--	--	--	--	--	--	--	--	--
New York	19	W	W	89	--	--	W	W	W	W
North Carolina	--	--	W	W	--	--	W	W	--	--
North Dakota	--	--	--	--	--	--	--	--	--	--
Ohio	W	W	W	W	--	--	W	W	W	W
Oklahoma	--	--	--	--	W	W	W	W	W	W
Oregon	--	--	--	--	--	--	W	W	--	--
Pennsylvania	W	W	W	W	W	W	311	834	W	W
Rhode Island	--	--	--	--	--	--	--	--	--	--
South Carolina	W	W	W	W	--	--	W	W	W	W
South Dakota	--	--	--	--	--	--	--	--	--	--
Tennessee	W	W	--	--	--	--	W	W	W	W
Texas	(2)	W	W	W	W	W	285	1,086	W	W
Utah	W	W	--	--	--	--	--	--	W	W
Vermont	W	W	--	--	--	--	--	--	--	--
Virginia	29	95	--	--	--	--	5	1	1	2
Washington	--	--	--	--	--	--	W	W	--	--
West Virginia	W	W	(2)	W	--	--	W	W	W	W
Wisconsin	W	W	--	--	--	--	173	390	38	157
Wyoming	--	--	--	--	--	--	--	--	--	--
Undistributed	496	1,124	230	1,089	282	1,071	1,534	6,524	2,772	11,792
Total [3]	601	1,387	234	1,176	282	1,071	3,514	11,868	4,512	21,546
Puerto Rico [e p]	--	--	--	--	--	--	--	--	--	--

See footnotes at end of table.

Table 4.—Sand and gravel sold or used by producers in the United States in 1972, by State, use, and class of operation [1]—Continued

(Thousand short tons and thousand dollars)

State	Gravel, construction							
	Building				Paving			
	Commercial		Government-and-contractor		Commercial		Government-and-contractor	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Alabama	992	1,727	--	--	1,796	2,220	--	--
Alaska	199	436	--	--	991	1,841	6,784	8,075
Arizona	7,325	8,610	35	48	7,269	8,050	1,316	2,385
Arkansas	2,029	3,696	--	--	2,552	3,158	741	840
California	23,334	35,278	77	139	29,964	40,990	3,906	5,069
Colorado	4,849	8,199	103	193	11,096	13,026	4,224	3,306
Connecticut	925	1,791	(2)	(2)	995	1,593	723	1,621
Delaware	164	416	--	--	W	W	--	--
Florida	W	W	--	--	W	W	45	45
Georgia	W	W	--	--	--	--	--	--
Hawaii	W	W	--	--	W	W	25	3
Idaho	643	1,262	160	107	1,329	1,788	2,817	3,276
Illinois	6,632	8,574	3	2	8,590	12,175	298	286
Indiana	4,621	5,935	126	117	8,127	10,289	964	662
Iowa	1,164	2,148	--	--	5,111	5,418	1,103	809
Kansas	163	275	67	43	816	866	1,200	715
Kentucky	963	1,599	--	--	944	1,351	139	24
Louisiana	6,312	9,776	--	--	3,576	5,207	--	--
Maine	659	975	--	--	1,058	1,289	6,176	2,565
Maryland	3,706	8,715	--	--	919	1,918	157	38
Massachusetts	3,795	7,301	75	188	2,337	3,148	1,334	1,189
Michigan	7,344	11,037	127	90	17,942	19,204	2,508	1,290
Minnesota	4,697	7,290	36	18	12,166	10,483	4,883	2,707
Mississippi	2,831	3,724	68	180	5,373	6,588	--	--
Missouri	1,682	2,375	--	--	1,280	1,671	7	17
Montana	520	799	60	43	773	975	7,395	13,214
Nebraska	1,122	1,315	78	8	5,172	6,142	717	823
Nevada	1,974	2,294	4	3	2,842	3,885	1,556	1,109
New Hampshire	999	1,549	--	--	475	739	977	241
New Jersey	1,930	4,428	--	--	1,147	1,975	13	11
New Mexico	1,879	2,572	--	--	1,449	1,580	225	186
New York	5,594	9,684	--	--	3,265	4,953	1,120	365
North Carolina	1,224	2,422	--	--	1,097	1,431	552	292
North Dakota	665	1,204	135	110	2,864	2,107	1,521	909
Ohio	8,406	12,302	--	--	14,094	20,801	119	106
Oklahoma	120	188	4	22	120	130	31	4
Oregon	5,582	8,125	61	86	7,173	10,396	3,433	4,199
Pennsylvania	3,992	7,389	--	--	2,866	5,940	--	--
Rhode Island	374	679	--	--	385	791	15	15
South Carolina	W	W	--	--	--	--	--	--
South Dakota	340	506	26	18	3,760	3,994	6,675	8,080
Tennessee	2,797	3,403	38	3	1,600	2,036	358	166
Texas	9,506	17,588	38	34	3,497	7,464	982	944
Utah	2,314	2,512	--	--	5,231	7,259	2,261	2,705
Vermont	495	849	--	--	541	544	553	128
Virginia	2,359	4,478	--	--	1,292	2,025	31	27
Washington	4,353	6,156	35	59	5,939	7,491	2,948	1,853
West Virginia	1,200	2,102	--	--	W	W	--	--
Wisconsin	4,822	5,300	1,205	632	7,421	6,172	5,240	3,761
Wyoming	597	773	2	4	1,400	1,930	2,983	5,375
Undistributed	2,499	6,013	--	--	2,471	2,733	--	--
Total [3]	150,692	235,766	2,562	2,148	201,105	255,767	79,054	79,434
Puerto Rico [e p]	2,011	7,280	--	--	849	3,004	--	--

See footnotes at end of table.

Table 4.—Sand and gravel sold or used by producers in the United States in 1972, by State, use, and class of operation [1]—Continued

(Thousand short tons and thousand dollars)

State	Gravel, construction—Continued											
	Railroad ballast (commercial)		Fill				Other				Gravel miscellaneous (commercial)	
			Commercial		Government-and-contractor		Commercial		Government-and-contractor			
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Alabama	--	--	W	W	--	--	W	W	--	--	W	147
Alaska	W	W	1,800	841	70	72	107	32	205	41	50	W
Arizona	W	W	956	780	231	66	209	533	--	--	119	313
Arkansas	(2)	(2)	115	194	8	9	--	--	62	37	113	103
California	W	W	1,590	1,356	6,599	862	689	938	2	4	835	1,362
Colorado	90	105	370	352	1,337	425	187	294	31	1	506	581
Connecticut	--	--	319	235	63	43	125	221	--	--	142	197
Delaware	--	--	W	16	--	--	--	--	--	--	--	--
Florida	--	--	--	--	--	--	--	--	--	--	--	--
Georgia	60	90	W	W	--	--	63	133	--	--	8	17
Hawaii	--	--	2	3	--	--	--	--	--	--	--	--
Idaho	--	--	658	483	322	95	W	W	173	139	55	41
Illinois	W	W	1,528	1,504	18	35	304	368	(2)	(2)	312	371
Indiana	W	W	1,110	956	68	15	42	52	21	5	470	519
Iowa	W	W	187	186	--	--	1,156	1,204	4	1	107	167
Kansas	W	W	169	124	23	16	6	12	223	120	166	269
Kentucky	--	--	93	123	--	--	--	--	--	--	W	65
Louisiana	W	W	W	W	22	57	W	W	--	--	W	W
Maine	W	W	290	149	30	7	72	47	--	--	289	332
Maryland	--	--	428	514	--	--	W	W	--	--	652	W
Massachusetts	12	31	1,511	975	2	2	547	737	1	2	698	773
Michigan	W	W	288	283	420	26	2,737	2,152	68	18	1,716	1,464
Minnesota	110	105	1,941	574	387	161	291	251	213	94	775	921
Mississippi	2	W	W	W	--	--	--	--	--	--	103	122
Missouri	W	W	31	29	--	--	W	W	7	10	162	252
Montana	W	W	200	164	239	139	W	W	96	46	96	113
Nebraska	117	162	W	W	--	--	245	240	339	549	447	382
Nevada	--	--	471	520	70	49	434	543	--	--	W	W
New Hampshire	--	--	307	225	39	5	W	W	--	--	W	W
New Jersey	--	--	929	917	--	--	88	141	--	--	642	1,347
New Mexico	--	--	56	42	1,582	1,299	(2)	(2)	48	41	198	116
New York	--	--	1,135	905	462	72	119	158	54	21	573	663
North Carolina	W	W	38	41	--	--	W	W	--		115	185
North Dakota	W	W	226	182	90	11	W	W	65	9	31	55
Ohio	W	W	1,743	1,629	10	10	250	306	--	--	728	1,323
Oklahoma	--	--	W	W	7	7	12	24	--	--	(2)	W
Oregon	156	230	1,572	1,589	246	217	92	127	1	1	377	419
Pennsylvania	--	--	340	301	--	--	106	137	--	--	363	747
Rhode Island	--	--	W	W	--	--	--	--	--	--	149	130
South Carolina	--	--	W	W	--	--	W	W	--	--	--	--
South Dakota	W	W	195	112	18	5	W	W	118	118	334	399
Tennessee	W	W	93	110	--	--	--	--	--	--	259	229
Texas	W	W	2,023	2,885	37	13	W	W	--	--	128	114
Utah	W	W	459	251	528	211	952	799	78	78	42	35
Vermont	--	--	85	41	1	(2)	W	W	--	--	20	60
Virginia	--	--	W	W	1	(2)	W	131	--	--	20	25
Washington	189	178	1,579	958	1,380	301	290	444	52	30	464	594
West Virginia	W	W	W	W	--	--	--	--	--	--	--	--
Wisconsin	121	105	1,513	1,018	355	59	682	740	6	3	456	431
Wyoming	W	306	122	88	11	4	15	20	27	2	277	80
Undistributed	1,371	1,021	2,312	3,967	--	--	1,164	2,094	--	--	484	2,295
Total [3]	2,229	2,332	28,784	25,621	14,674	4,292	10,985	12,876	1,895	1,371	13,482	17,759
Puerto Rico [e p]	--	--	258	323	--	--	--	--	--	--	--	--

[e] Estimate. [p] Preliminary. W Withheld to avoid disclosing individual company confidential data, included with "Undistributed."

[1] Includes Puerto Rico.

[2] Less than ½ unit.

[3] Data may not add to totals shown because of independent rounding.

[4] Includes unspecified.

Table 5.—Sand and gravel sold or used by Government-and-contractor producers in the United States, by use [1]

(Thousand short tons and thousand dollars)

Year	Sand							
	Building		Paving		Fill		Other	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1968	819	893	35,550	27,297	7,327	3,997	2,615	1,920
1969	1,016	1,320	32,123	28,317	6,123	3,745	2,168	1,014
1970	883	1,058	43,130	41,965	5,234	2,195	1,632	834
1971	1,434	1,489	30,334	32,046	4,086	1,145	2,298	1,360
1972	2,976	1,777	20,218	19,845	3,996	1,581	2,212	1,121

Year	Gravel								Total Government-and-contractor sand and gravel [2]	
	Building		Paving		Fill		Other			
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1968	1,830	1,841	121,893	103,803	32,837	27,679	3,934	3,972	206,805	171,327
1969	1,976	2,522	133,127	116,774	28,240	19,481	1,423	890	206,189	174,070
1970	1,839	1,516	141,316	137,579	16,144	6,990	1,323	1,009	211,454	193,145
1971	2,857	2,667	96,453	98,410	7,723	2,981	2,033	1,143	147,212	141,229
1972	2,562	2,148	79,054	79,434	14,674	4,292	1,895	1,371	127,587	111,569

[1] Excludes American Samoa, Panama Canal Zone, and Puerto Rico.
[2] Data may not add to totals shown because of independent rounding.

Table 6.—Sand and gravel sold or used by Government-and-contractor producers in the United States, by type of producer [1]

(Thousand short tons and thousand dollars)

Type of producer	1968		1969		1970		1971		1972	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction and maintenance crews	62,939	42,146	65,786	45,691	67,238	39,446	58,820	30,428	62,072	36,013
Contractor	143,866	129,176	140,403	128,377	144,214	153,699	88,395	110,800	65,515	75,556
Total [2]	206,805	171,327	206,189	174,070	211,454	193,145	147,212	141,229	127,587	111,569
State	125,627	108,980	122,484	108,414	136,800	134,482	79,213	85,347	65,561	65,244
Counties	53,087	38,408	52,547	39,429	58,180	37,159	56,175	38,176	52,228	35,154
Municipalities	4,200	3,208	3,784	4,466	3,285	3,125	2,266	2,013	2,658	2,546
Federal agencies	23,891	20,731	27,374	21,761	13,189	18,379	9,558	15,693	7,141	8,624
Total	206,805	171,327	206,189	174,070	211,454	193,145	147,212	141,229	127,587	111,569

[1] Excludes American Samoa, Canal Zone, and Puerto Rico.
[2] Data may not add to totals shown because of independent rounding.

Table 7.—Sand and gravel sold or used by producers in the United States by class of operation and degree of preparation [1]

(Thousand short tons and thousand dollars)

	1971		1972	
	Quantity	Value	Quantity	Value
Commercial operations:				
Prepared	712,627	963,180	716,244	1,037,177
Unprepared	59,760	44,564	69,544	50,774
Total [2]	772,382	1,007,741	785,788	1,087,951
Government-and-contractor operations:				
Prepared	135,791	135,825	106,986	98,679
Unprepared	11,418	5,400	20,601	12,890
Total [2]	147,212	141,229	127,587	111,569
Grand Total [2]	919,593	1,148,969	913,375	1,199,520

[1] Excludes American Samoa and Puerto Rico.
[2] Data may not add to totals shown because of independent rounding.

Table 8.—Number and production of domestic commercial sand and gravel plants, by size of operation [1]

Annual production (short tons)	1971				1972			
	Plants [2]		Production		Plants [2]		Production	
	Number	Percent of total	Thousand short tons	Percent of total	Number	Percent of total	Thousand short tons	Percent of total
Less than 25,000	1,835	32.0	21,049	2.7	1,630	30.3	17,541	2.2
25,000 to 50,000	949	16.5	37,244	4.8	850	15.8	30,508	3.9
50,000 to 100,000	984	17.1	74,015	9.6	957	17.8	68,788	8.8
100,000 to 200,000	908	15.8	132,900	17.2	849	15.8	121,304	15.4
200,000 to 300,000	415	7.2	101,406	13.1	400	7.4	97,088	12.4
300,000 to 400,000	240	4.2	85,153	11.0	217	4.0	75,157	9.6
400,000 to 500,000	112	2.1	50,349	6.5	134	2.5	59,757	7.6
500,000 to 600,000	76	1.3	42,083	5.4	79	1.5	42,924	5.5
600,000 to 700,000	59	1.0	39,778	5.2	71	1.3	46,036	5.9
700,000 to 800,000	36	.6	26,877	3.5	56	1.0	41,860	5.3
800,000 to 900,000	33	.6	28,057	3.6	26	.5	22,310	2.8
900,000 to 1,000,000	21	.4	19,960	2.6	27	.5	25,666	3.3
1,000,000 and over	70	1.2	113,511	14.8	88	1.6	136,850	17.3
Total	5,738	100.0	772,382	100.0	5,384	100.0	[3] 785,788	100.0

[1] Excludes American Samoa and Puerto Rico.
[2] Includes a few companies operating more than 1 plant but not submitting returns for individual plants.
[3] Data may not add to totals shown because of independent rounding.

Table 9.—Sand and gravel sold or used in the United States, by class of operation and method of transportation [1]

	1971		1972	
	Thousand short tons	Percent of total	Thousand short tons	Percent of total
Commercial:				
Truck	699,339	76	707,868	77
Rail	43,286	4	44,675	5
Waterway	27,298	3	27,050	3
Unspecified	2,461	1	6,195	1
Total commercial [2]	772,382	84	785,788	86
Government-and-contractor: Truck [3]	147,212	16	127,587	14
Grand total [2]	919,593	100	913,375	100

[1] Excludes American Samoa and Puerto Rico.
[2] Data may not add to totals shown because of independent rounding.
[3] Entire output of Government-and-contractor operations assumed to be moved by truck.

Table 10.—Ground sand sold or used by producers in the United States,[1] [2] by use

(Thousand short tons and thousand dollars)

Use	1971		1972	
	Quantity	Value	Quantity	Value
Abrasives	171	1,706	204	1,938
Chemicals	26	220	141	568
Enamel	36	342	52	525
Filler	170	1,411	172	1,648
Foundry use	709	3,710	2,318	6,288
Glass	346	1,257	1,042	5,696
Pottery, porcelain, tile	187	1,958	221	2,261
Unspecified	268	2,291	362	2,623
Total[3]	1,911	12,893	4,512	21,546

[1] Includes Alabama (1972), Arkansas, California (1972), Connecticut (1971), Florida, Georgia, Idaho (1972), Illinois, Indiana, Iowa (1972), Kansas (1972), Kentucky, Louisiana (1971), Massachusetts (1972), Michigan, Minnesota, Missouri, Nevada, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee (1972), Texas, Utah, Virginia, West Virginia, and Wisconsin (1972).

[2] Excludes American Samoa and Puerto Rico.

[3] Data may not add to totals shown because of independent rounding.

Table 11.—U.S. imports for consumption of sand and gravel, by class

(Thousand short tons and thousand dollars)

Year	Glass sand[1]		Sand, n.s.p.f., crude or manufactured, and gravel		Total	
	Quantity	Value	Quantity	Value	Quantity	Value
1970	64	262	815	1,338	879	1,600
1971	48	243	667	984	715	1,227
1972	49	201	712	1,178	761	1,379

[1] Classification reads: Sands containing 95% or more silica and not more than 0.6% oxide of iron and suitable for manufacturing glass.