

The Mineral Industry of Washington

This chapter has been prepared under a cooperative agreement between the Bureau of Mines, U.S. Department of the Interior, and the Washington Division of Mines and Geology for collecting information on all minerals.

By Benjamin Petkof¹

The total value of mineral production increased during the year. Decreased production of portland cement, lead, silver, gold, and tungsten was offset by increased output of other mineral products such as clay, coal, sand and gravel, diatomite, olivine, and talc. The output of nonmetallic minerals greatly exceeded that of metallic

minerals and fossil fuels.

The production of aluminum in Washington declined during 1973 because of an electrical power shortage in the Pacific Northwest, which resulted from low water conditions.

¹ Physical scientist, Division of Nonferrous Metals—Mineral Supply.

Table 1.—Mineral production in Washington¹

Mineral	1972		1973	
	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:				
Masonry -----thousand short tons--	6	\$170	6	\$169
Portland -----do-----	1,239	26,848	1,194	26,651
Clays ² -----do-----	264	584	287	664
Coal, bituminous -----do-----	2,635	17,424	3,270	21,440
Gem stones -----do-----	NA	163	NA	160
Gypsum -----thousand short tons--	5	13	W	W
Lead (recoverable content of ores, etc.) -----short tons--	2,567	772	2,217	722
Peat -----thousand short tons--	18	89	21	110
Pumice -----do-----	W	W	1	1
Sand and gravel -----do-----	23,065	26,069	27,935	30,132
Silver (recoverable content of ores, etc.) -----thousand troy ounces--	221	372	W	W
Stone -----thousand short tons--	14,712	23,764	11,384	19,284
Zinc (recoverable content of ores, etc.) -----short tons--	6,483	2,301	6,378	2,636
Value of items that cannot be disclosed:				
Clays (fire clay), copper, diatomite, gold, lime, olivine, stone (dimension 1972), talc, tungsten, uranium, and values indicated by symbol W	XX	11,237	XX	12,361
Total -----	XX	109,806	XX	114,329
Total 1967 constant dollars -----	XX	90,601	XX	83,940

² Preliminary. NA Not available. W Withheld to avoid disclosing individual company confidential data; included with "Value of items that cannot be disclosed." XX Not applicable.

¹ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

³ Excludes fire clay; included with "Value of items that cannot be disclosed."

⁴ Excludes some dimension stone; included with "Value of items that cannot be disclosed."

Table 2.—Value of mineral production in Washington, by county
(Thousands)

County	1972	1973	Minerals produced in 1973 in order of value
Adams	\$2,543	W	Stone, sand and gravel.
Asotin	20	\$58	Sand and gravel.
Benton	W	W	Stone, sand and gravel.
Chelan	366	W	Stone, sand and gravel, copper, silver.
Clallam	1,028	W	Clays, stone, sand and gravel.
Clark	2,073	2,278	Stone, sand and gravel, clays.
Columbia	109	96	Stone.
Cowlitz	1,527	1,219	Stone, sand and gravel.
Douglas	W	62	Sand and gravel, clays.
Ferry	W	3,247	Gold, silver, stone, copper, zinc, lead.
Franklin	W	W	Sand and gravel, stone.
Garfield	W	138	Stone.
Grant	5,416	3,682	Diatomite, sand and gravel, lime, stone.
Grays Harbor	1,020	978	Sand and gravel, stone.
Island	W	305	Do.
Jefferson	W	W	Stone, sand and gravel.
King	22,881	24,502	Cement, sand and gravel, stone, coal, clays, peat.
Kitsap	674	W	Sand and gravel, stone, peat.
Kittitas	130	272	Stone, sand and gravel, clays, pumice.
Klickitat	291	299	Stone, sand and gravel.
Lewis	W	22,047	Coal, sand and gravel, stone, clays.
Lincoln	175	90	Stone.
Mason	W	W	Sand and gravel, stone.
Okanogan	W	W	Stone, sand and gravel, gypsum.
Pacific	419	520	Stone.
Pend Oreille	8,478	7,207	Cement, zinc, lead, stone, sand and gravel, silver, copper.
Pierce	6,307	8,696	Sand and gravel, stone, lime, clays.
San Juan	W	W	Sand and gravel, stone.
Skegitt	2,051	2,912	Olivine, stone, sand and gravel, talc.
Skamania	249	359	Stone, gold, sand and gravel, copper, silver.
Snohomish	5,425	W	Sand and gravel, stone, clays, peat.
Spokane	3,260	3,532	Do.
Stevens	5,207	5,218	Uranium, stone, sand and gravel, clays, tungsten, lead, silver.
Thurston	686	983	Sand and gravel, stone, peat.
Wahkiakum	W	W	Stone.
Walla Walla	W	W	Sand and gravel.
Whatcom	W	W	Cement, stone, sand and gravel, clays.
Whitman	W	W	Stone, sand and gravel.
Yakima	1,735	1,449	Sand and gravel, stone, lime.
Undistributed ¹	37,732	24,180	
Total²	109,806	114,329	

W Withheld to avoid disclosing individual company confidential data; included with "Undistributed."

¹ Includes value of mineral production that cannot be assigned to specific counties and values indicated by symbol W.

² Data may not add to totals shown because of independent rounding.

Legislation and Government Programs.—No legislative actions were implemented during the year that had any significant influence on the State's minerals industry.

Environment.—Increased demand and prices for copper and molybdenum have increased the economic viability of a large low-grade copper deposit on the Bren Mac property. The proximity of the water source for the city of Everett, Wash., to the Bren Mac property and the possibility of contamination of the water source by mining operations, caused the city to file suit in Snohomish Superior Court to stop additional development work on the property. In addition, an environmental impact

statement must be prepared and the property rezoned prior to permitting mining operations. Future operation of the property will be dependent on the resolution of these issues.

The Puget Sound Air Pollution Control Agency approved regulations to limit arsenic emissions from nonferrous smelters. As a result, American Smelting and Refining Company (Asarco) announced plans to lower arsenic emissions from a high of 700 pounds per day to 50 pounds per day. Installation of a baghouse on the plant's main stack was under consideration to remove 90% of the process sulfur.

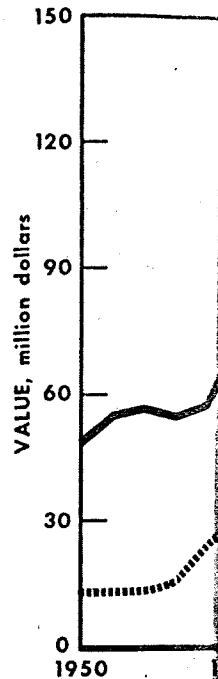


Figure 1.—Value of mineral production in Washington, 1950-1973.

Annual average labor force	
Total labor force	-----
Unemployment	-----
Employment:	
Construction	-----
Aerospace	-----
Lumber and wood	-----
Food processing	-----
All manufacturing	-----
All industries	-----
Personal income:	
Total	-----
Per capita	-----
Construction activity:	
Value of nonresidential	-----
State highway construction	-----
Cement shipments	-----
Farm marketing receipts	-----
Mineral production value	-----

^P Preliminary.

Sources: Survey of Mineral Production in Washington State; U.S. Bureau of Economic Analysis; U.S. Bureau of Labor Statistics; U.S. Bureau of Economic Analysis; U.S. Bureau of Economic Analysis; U.S. Bureau of Economic Analysis.

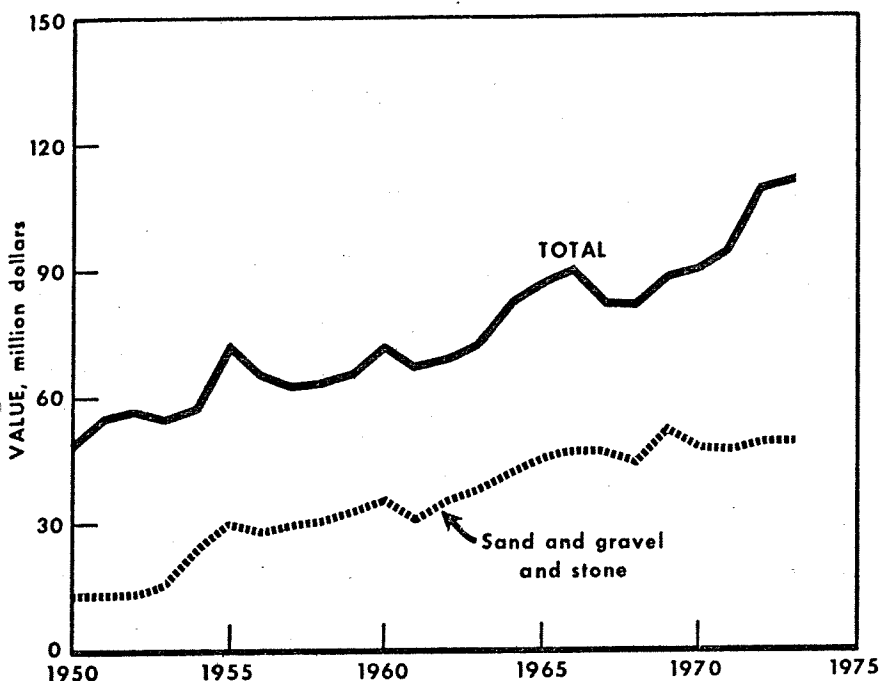


Figure 1.—Value of sand and gravel and stone, and total value of mineral production in Washington.

Table 3.—Indicators of Washington business activity

	1972	1973 P	Change, percent
Annual average labor force and employment:			
Total labor force -----thousands---	1,436	1,464	+1.9
Unemployment -----do-----	137	113	-17.5
Employment:			
Construction -----do-----	52.2	55.3	+5.9
Aerospace -----do-----	41.4	50.5	+22.0
Lumber and wood products -----do-----	47.3	50.1	+5.9
Food processing -----do-----	27.7	28.4	+2.5
All manufacturing -----do-----	224.1	244.8	+9.2
All industries -----do-----	877.9	906.5	+3.3
Personal income:			
Total -----millions---	\$15,399.0	\$17,106.0	+11.1
Per capita -----do-----	\$4,472.0	\$4,989.0	+11.6
Construction activity:			
Value of nonresidential construction -----millions---	\$252.6	\$352.7	+39.6
State highway commission: Value of contracts awarded -----millions---	\$184.0	\$116.0	-37.0
Cement shipments to and within Washington			
-----thousand short tons---	1,098.0	1,110.0	+1.1
Farm marketing receipts -----millions---	\$1,123.8	\$1,572.5	+39.3
Mineral production value -----do-----	\$109.8	\$114.3	+4.1

P Preliminary.

Sources: Survey of Current Business; Employment and Earnings; Labor Force and Employment in Washington State; and the U.S. Bureau of Mines.

REVIEW BY MINERAL COMMODITIES

NONMETALS

Cement.—Shipments of portland cement in 1973 declined 4% in quantity and 1% in value from those of 1972 to 1.19 million short tons valued at \$26.65 million. Shipments of 5,689 tons of prepared masonry cement valued at \$169,415 represented only a slight decline from the quantity and value of material shipped in 1972. Output originated at four plants, (three wet and one dry process), each producing both portland and masonry cement. Shipments of portland cement included types I, II, and III (general use, moderate heat, high-early-strength) and white cement.

Ready-mix concrete, and concrete product manufacturers, building material dealers, and contractors were the major consumers.

Clays.—Production increased 9% in quantity and 14% in value over that of 1972. Clay was produced in 11 counties, but five counties accounted for 91% of total production. Fire clay was produced in only two counties.

Gypsum.—Argo Minerals, Inc., mined gypsum at the Poison Lake mine in Okanogan County. Kaiser Gypsum Co., Inc., calcined gypsum in King County.

Lime.—Domtar Chemicals, Inc., and Utah-Idaho Sugar Co. produced lime in Grant, Pierce, and Yakima Counties for sugar refining, paper and pulp processing, calcium carbide production, sewage treatment, and other uses. Output declined slightly in quantity and value from that of 1972. The lime was consumed in Washington, Oregon, and other nearby western States. Lime consumption in Washington declined from 164,000 tons in 1972 to 141,944 tons in 1973.

Sand and Gravel.—Production increased 21% in quantity and 16% in value from that of 1972 because of increased sand and gravel demand for end uses such as fill and paving. Commercial operations provided 81% of the total; the remainder was provided by local government contractors' crews. Production was reported from 33 counties but Grant, King, Pierce, Snohomish, and Spokane Counties accounted for 62% of the total.

The consumption pattern for sand and gravel in Washington for 1973 was as follows: Paving, 42%; building, 27%; fill, 25%; and other uses, 6%.

Stone.—The production of crushed and broken stone declined 23% in quantity from that of 1972; value also declined. There were 262 operating quarries in 36 counties, but 55 quarries in 5 counties produced 37% of the stone reported. There were seven counties whose production was valued in excess of \$1 million. Four uses—riprap, road base, surface treatment, and aggregate—consumed 66% of the available crushed stone.

Traprock constituted 77% of the stone quarried and came from 183 quarries in 28 counties. About 75% was used for aggregate, road material, and riprap. Granite was produced in 18 quarries and accounted for 7% of the stone. Fifteen quarries produced limestone to furnish almost 9% of the total stone output. Almost three-fourths of total limestone production was used to make cement and lime.

METALS

Aluminum.—Primary aluminum production declined less than 1% in quantity and 4% in value from that of 1972. Washington's share of national production was 23%, a decline of 2% from that of 1972. The lack of growth in Washington's primary aluminum production in 1973 may be attributed to the shortage of electrical power in the Pacific Northwest due to low water conditions. Five firms, with a total of seven plants, produced aluminum from alumina, imported primarily from Australia.

Copper.—Bren Mac Mines, Ltd., planned to continue exploration on the Sunrise property to delineate the zone, in a large breccia pipe, that contains a copper-molybdenum mineralization. The deposit is located near the city of Everett's water supply in the Sultan Basin.

Silver Standard Mines, Ltd., Vancouver, British Columbia, planned a drilling program in the Danville area of northern Ferry County, an area of known mineralization that might be an extension of the boundary copper belt. Geochemical reconnaissance has indicated copper and molybdenum anomalies.

The Ram Mining Co. prospected at the Wayside mine near Granite Falls in Snohomish County. Construction of a small mill was planned to determine the capability of

Table 4.—Washington

Class of operation	
Commercial operations:	
Sand:	
Building	-----
Fill	-----
Glass	-----
Paving	-----
Other uses ¹	-----
Total ²	-----
Gravel:	
Building	-----
Fill	-----
Paving	-----
Railroad ballast	-----
Miscellaneous	-----
Other uses	-----
Total ²	-----
Government-and-contractor:	
Sand:	
Fill	-----
Paving	-----
Other uses	-----
Total ²	-----
Gravel:	
Building	-----
Fill	-----
Paving	-----
Other uses	-----
Total ²	-----
Total sand and gravel	

W Withheld to avoid disclosure
¹ Includes ground and broken stone
² Data may not add to total
³ Included with paving

Table 5.—

Dimension stone total	-----
Crushed and broken:	
Bituminous aggregate	-----
Concrete aggregate	-----
Dense graded roadbase	-----
Macadam aggregate	-----
Surface treatment and	-----
Unspecified construction	-----
Agricultural limestone	-----
Asphalt filler	-----
Cement and lime material	-----
Fill	-----
Manufactured fine aggregate	-----
Metallurgical purposes	-----
Railroad ballast	-----
Riprap and jetty stone	-----
Other uses ²	-----
Crushed total ³	-----
Grand total ³	-----

W Withheld to avoid disclosure
¹ Includes ferrosilicon
² Includes acid neutralizing capacity
³ Data may not add to total

Table 4.—Washington: Sand and gravel sold or used by producers, by class of operation and use
(Thousand short tons and thousand dollars)

Class of operation and use	1972		1973	
	Quantity	Value	Quantity	Value
Commercial operations:				
Sand:				
Building	3,228	4,721	3,029	4,270
Fill	892	640	2,495	1,811
Glass	53	480	W	95
Paving	1,249	1,723	1,190	1,431
Other uses ¹	28	54	205	385
Total²	5,451	7,619	6,919	7,993
Gravel:				
Building	4,353	6,156	4,339	6,217
Fill	1,579	958	2,977	1,821
Paving	5,939	7,491	6,795	8,129
Railroad ballast	189	178	107	136
Miscellaneous	464	594	855	1,143
Other uses	290	444	671	1,227
Total²	12,814	15,821	15,743	18,673
Government-and-contractor operations:				
Sand:				
Fill	W	W	--	--
Paving	W	W	26	58
Other uses	387	385	74	53
Total²	387	385	101	111
Gravel:				
Building	35	59	35	17
Fill	1,380	301	1,335	272
Paving	2,948	1,883	3,691	3,015
Other uses	412	(³)	111	50
Total²	4,414	2,243	5,173	3,355
Total sand and gravel²	23,065	26,069	27,935	30,132

W Withheld to avoid disclosing individual company confidential data; included with "Other uses."

¹ Includes ground and unground sand (1972), railroad ballast (1973), and other sands.

² Data may not add to totals shown because of independent rounding.

³ Included with paving gravel.

Table 5.—Washington: Stone sold or used by producers, by use
(Thousand short tons and thousand dollars)

Use	1972		1973	
	Quantity	Value	Quantity	Value
Dimension stone total	3	W	6	346
Crushed and broken:				
Bituminous aggregate	517	926	580	1,123
Concrete aggregate	408	W	292	572
Dense graded roadbase stone	1,712	2,810	1,357	2,126
Macadam aggregate	W	375	114	200
Surface treatment aggregate	2,654	4,079	1,800	2,635
Unspecified construction aggregate and roadstone	5,419	7,443	2,135	2,598
Agricultural limestone	15	W	14	67
Asphalt filler	W	W	69	W
Cement and lime manufacture	W	W	893	1,295
Fill	134	132	746	W
Manufactured fine aggregate (stone sand)	W	W	24	50
Metallurgical purposes ¹	72	215	49	120
Railroad ballast	321	543	559	872
Riprap and jetty stone	1,489	2,037	2,240	3,955
Other uses ²	1,918	5,204	565	3,327
Crushed total³	14,708	23,764	11,377	18,938
Grand total³	14,712	W	11,384	19,284

W Withheld to avoid disclosing individual company data; included with "Other uses."

¹ Includes ferrosilicon and flux stone.

² Includes acid neutralization, abrasives, drain fields, glass, paper manufacture, roofing aggregates, sugar refining, terrazzo, uses not specified, and waste material. The 1972 data include building products, filter stone, and refractory stone.

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

Table 6.—Washington: Primary aluminum plant production data

Year	Primary production		
	Quantity (thousand short tons)	Percent of national total	Value (thousands)
1968	775	24	\$394,261
1969	1,003	26	541,834
1970	1,023	26	569,377
1971	934	24	516,407
1972	* 1,049	* 25	532,678
1973	1,048	23	513,732

* Revised.

separating the minerals from a complex chalcopyrite-sphalerite ore.

Gold-Silver.—Production of gold and silver declined during the year, but the value of production increased, following the upward trend in world prices for these precious metal commodities. The average value of gold and silver produced in 1973 was \$97.81 and \$2.56 per troy ounce, respectively. Increasing price and demand for gold and silver may stimulate exploration and production. Silver was produced in Chelan, Ferry, Pend Oreille, Skamania and Stevens Counties.

Lead-Zinc.—Directors of the Pend Oreille Mines & Metals Co. were reported to have approved in principle a proposal to merge with the Bunker Hill Co., a wholly owned subsidiary of Gulf Resources and Chemical Corp. Pend Oreille Mines has a lead-zinc operation near Metaline Falls, Wash.

Magnesium.—Northwest Alloys Inc., a subsidiary of the Aluminum Company of America (Alcoa), began site preparation for its \$50 million magnesium plant at Addy, Wash. The State Department of Ecology and the company agreed on conditions for granting a construction permit. The plant was expected to have a capacity of 40,000 tons per year and to have begun production in late 1975.

MINERAL FUELS

Coal.—Bituminous coal production increased 24% from that of 1972. The bulk of production came from two strip mining operations in Lewis County. The remaining production came from one underground operation in King County.

Geothermal Energy.—The Department of Natural Resources, State of Washington, has issued a report entitled "The Search for Hot Rocks, Geothermal Exploration, Pacific Northwest" (Reprint 11), listing the requirements for the existence of a geothermal reservoir and discussing the dry-steam and hot-water thermal fields. Development of geothermal resources in the future could enhance the energy outlook for Washington and other States of the Pacific Northwest.

Peat.—Production was reported in five counties during the year. Thurston County as the largest producing county, followed by Spokane County. Production increased 17% over that of 1972; value increased 24%. The average value was \$5.24 per ton. The material was sold in bulk for use in soil improvement.

Petroleum and Natural Gas.—Eight Canadian mining and oil companies planned to drill for oil and gas in Stevens County, north of Spokane, Wash. Several shallow wells had been drilled on the 14,000-acre site previously, and indications of oil and gas were observed.

Commodity and company

NONMETALS

Cement:
Columbia Cement Co.
division of Filtrol
Ideal Cement Co., a d
of Ideal Basic Ind
Inc.¹
Lehigh Portland Ce
Co.¹
Lone Star Industries

Clays:
Interpace Corp

Lowell Brick Co

Mutual Materials Co

Pacific Concrete Ind

Diatomite: Kenite Corp.
division of Witco Chem.

Gypsum: Agro Minerals

Lime: Domtar Chemical
Lime Div.

Olivine: Northwest Inter

Pumice and pumicite: W. L. Marenakos C

Sand and gravel:
Central Pre-Mix Co

N. Fiorito Co., Inc.

Friday Harbor Sand
Gravel Co.

Glacier Sand & Gr

Lone Star Indust

Materne Bros

Reid Sand and Gr

Stoneway Concrete

S & S Sand & Gr

Woodworth & Co.

Silicon carbide: The
dum Co.

Stones:
Black River Quar

Bohemia Inc

Columbia Cement

Degerstrom, N.A.

Friend & Rikals

General Construct

Interstate Asphal

Lehigh Portland

Monroe Quarry

Woodworth & Co

Sulfuric acid: Amer
ing and Refining C
See footnotes at en

Table 7.—Principal producers

Commodity and company	Address	Type of activity	County
NONMETALS			
Cement:			
Columbia Cement Co., a division of Filtrrol Corp.	Marietta Road, P.O. Box 37 Bellingham, Wash. 98225	Plant	Whatcom.
Ideal Cement Co., a division of Ideal Basic Industries, Inc. ¹	420 Ideal Cement Bldg. Denver, Colo. 80202	do.	King.
Lehigh Portland Cement Co. ¹	718 Hamilton Mall Allentown, Pa. 18105	do.	Pend Oreille.
Lone Star Industries, Inc.	P.O. Box 2047 Seattle, Wash. 98111	do.	King.
Clays:			
Interpace Corp.	2901 Los Feliz Blvd. Los Angeles, Calif. 90039	3 pits and plants.	Do.
		2 pits and plants.	Spokane.
		Pit and plant	Stevens.
		do.	Snohomish.
Lowell Brick Co.	Box 3005 Everett, Wash. 98203	do.	King, Pierce.
Mutual Materials Co.	P.O. Box 3547 Seattle, Wash. 98124	do.	King, Pierce.
Pacific Concrete Industries	P.O. Box J Bellingham, Wash. 98225	Pit	Whatcom.
Diatomite: Kenite Corp., a division of Witco Chem. Corp.	277 Park Ave. New York, N.Y. 10017	Mine and plant	Grant.
Gypsum: Agro Minerals, Inc.	P.O. Box Call Tonasket, Wash. 98855	Plant	Okanogan.
Lime: Domtar Chemicals, Inc., Lime Div.	1220 Alexander Ave. Tacoma, Wash. 98421	Plant	Pierce.
Olivine: Northwest International	329 Kincaid Mount Vernon, Wash. 98273	Mine and plant	Skagit.
Pumice and pumicite:			
W. L. Marenakos Co.	Route 1, Box 921 Issaquah, Wash. 98027	Plant	Kittitas.
Sand and gravel:			
Central Pre-Mix Concrete	805 North Division St. Spokane, Wash. 99202	Pit and plant	Spokane, Adams, Franklin.
N. Fiorito Co., Inc.	844 NW 48th St. Seattle, Wash. 98107	Pits	Skagit.
Friday Harbor Sand and Gravel Co.	Box 1051 Main St. Vancouver, 4, British Columbia, Canada	Pit and plant	San Juan.
Glacier Sand & Gravel Co.	5975 E. Marginal Way Seattle, Wash. 98134	do.	King, Pierce.
Lone Star Industries, Inc.	P.O. Box 1020 Seattle, Wash. 98111	Pit	Pierce.
Materne Bros.	Box O, Rosewood Station Spokane, Wash. 99208	Pits	Various.
Reid Sand and Gravel Inc.	Box 922 Bellevue, Wash. 98009	Pit and plant	King.
Stoneway Concrete, Inc.	Box 509 Renton, Wash. 98055	do.	Do.
S & S Sand & Gravel Co. ²	Box 1211 Ephrata, Wash. 98823	do.	Various.
Woodworth & Co., Inc.	1200 East D St. Tacoma, Wash. 98421	do.	Pierce.
Silicon carbide: The Carbofundum Co.	P.O. Box 423 Niagara Falls, N.Y. 14302	Plant	Clark.
Stone:			
Black River Quarry, Inc.	6808 South 140th Seattle, Wash. 98178	Quarry	King.
Bohemia Inc.	2280 Oakmont Way Eugene, Oreg. 97401	do.	Clark.
Columbia Cement Co.	P.O. Box 37 Bellingham, Wash. 98225	do.	Whatcom.
Degerstrom, N.A.	Box 425 Spokane, Wash. 99210	do.	Various.
Friend & Rikals, Inc.	Box 3 Aberdeen, Wash. 98520	do.	Grays Harbor.
General Construction Co.	Box 3845 Seattle, Wash. 98124	Quarry and plant.	Jefferson.
Interstate Asphalt Co., Inc.	Box 208 Aberdeen, Wash. 98520	do.	Kitsap.
Lehigh Portland Cement Co.	718 Hamilton Mall Allentown, Pa. 18105	do.	Pend Oreille.
Monroe Quarry	Box 488 Monroe, Wash. 98272	do.	Snohomish.
Woodworth & Co., Inc.	1200 East D St. Tacoma, Wash. 98421	Quarry	Pierce.
Sulfuric acid: American Smelting and Refining Co.	Box 1605 Tacoma, Wash. 98401	Smelter	Do.

See footnotes at end of table.

Production data

Year	Value (thousands)
24	\$394,261
26	541,834
26	569,377
24	516,407
25	532,678
23	513,732

FUELS

Coal production in 1972. The bulk of 1972. The bulk from two strip mining counties. The remainder from one underground county.

The Department of Energy of Washington, has issued "The Search for Energy Resources, Part II," listing the existence of a geothermal field. Development in the future could look for Washington of the Pacific North-

was reported in five Thurston County, followed production increased 1972; value increased was \$5.24 per ton. in bulk for use in

Natural Gas.—Eight oil companies plan and gas in Stevens, Wash. Several drilled on the H. and indications of

Table 7.—Principal producers—Continued

Commodity and company	Address	Type of activity	County
NONMETALS—Continued			
Talc and soapstone:			
Skagit Talc Co -----	220 Reed St. Sedro Woolley, Wash. 98284	Quarry -----	Skagit.
Western Minerals, Inc -----	3314 Harbor Ave. S.W. Seattle, Wash. 98126	-----do-----	Do.
Vermiculite (exfoliated): Vermiculite-Northwest, Inc.	P.O. Box A Auburn, Wash. 98002	Plant -----	Spokane.
METALS			
Aluminum:			
Aluminum Company of America.	Vancouver, Wash. 98600	Reduction plant	Clark.
Intalco Aluminum Corp -----	Wenatchee, Wash. 98801	-----do-----	Chelan.
Kaiser Aluminum & Chemical Corp.	Bellingham, Wash. 98225	-----do-----	Whatcom.
Martin Marietta Aluminum Inc.	Spokane, Wash. 99200	-----do-----	Spokane.
Reynolds Metals Co -----	Tacoma, Wash. 98400	-----do-----	Pierce.
	Goldendale, Wash. 98620	-----do-----	Klickitat.
	Longview, Wash. 98620	-----do-----	Cowlitz.
Ferroalloys:			
Foote Mineral Co -----	Wenatchee, Wash. 98801	Plant -----	Douglas.
Ohio Ferro-Alloys Corp -----	Tacoma, Wash. 98400	-----do-----	Pierce.
Gold and silver: Knob Hill Mines, Inc.	160 Sansome St. San Francisco, Calif. 94104	Mine and mill	Ferry.
Lead-zinc: Pend Oreille Mines & Metals Co.	923 Old National Bank Bldg. Spokane, Wash. 99201	-----do-----	Pend Oreille.
Steel:			
Bethlehem Steel Co., Pacific Coast Div.	Seattle, Wash. 98124	Plant -----	King.
Northwest Steel Rolling Mills, Inc.	Seattle, Wash. 98107	-----do-----	Do.
Uranium: Dawn Mining Co ---	Box 25 Ford, Wash. 99013	Mine and mill	Stevens.
MINERAL FUELS			
Coal: Washington Irrigation and Development Co.	R.R. 2, Box 41 Centralia, Wash. 98531	Strip mine ---	Lewis.
Peat:			
Asbury Fuel Co -----	2424 Hilltop Dr. Bremerton, Wash. 98313	Bog -----	Kitsap.
Cunningham Sand & Gravel Co., Inc	North 6315 Cedar St. Spokane, Wash. 99208	Bog -----	Spokane.
Kildow Bros., Inc -----	Route 15, Box 550 Olympia, Wash. 98502	Bog -----	Thurston.
Maple Valley Humus -----	18805 SE 170th St. Renton, Wash. 98055	Bog -----	King.
Plant Food Co -----	14515 35th Ave. Bothell, Wash. 98011	Bog -----	Snohomish.
Petroleum refining:			
Atlantic Richfield Co -----	Ferndale, Wash. 98248	Refinery -----	Whatcom.
Mobile Oil Corp -----	-----do-----	-----do-----	Do.
Shell Oil Co -----	Anacortes, Wash. 98221	-----do-----	Skagit.
Sound Refining, Inc -----	Tacoma, Wash. 98400	-----do-----	Pierce.
Texaco, Inc -----	Anacortes, Wash. 98221	-----do-----	Skagit.
U.S. Oil & Refining Co -----	Tacoma, Wash. 98400	-----do-----	Pierce.

¹ Also rock.² Also traprock.

This chapter has been prepared by the U.S. Department of the Interior, Bureau of Mines, U.S. Department of the Interior, Survey for collecting

In 1973 West Virginia produced more coal than any other State in the Nation in the amount of 115 million tons. Coal is the principal source of the State's energy, supplying 89.1% of the State's electricity production was 115 million tons.

Clays ² -----	
Coal (bituminous) -----	
Gem stones -----	
Natural gas -----	
Petroleum (crude) -----	
Salt -----	
Sand and gravel -----	
Stone ³ -----	
Value of items that cannot be measured in terms of quantity	
Cement, clays (fire clays)	
Total -----	
Total 1967 constant prices	

¹ Preliminary.
² Production as measured by producers.
³ Excludes fire clay and dimension stone.