2018 Report on Ohio Mineral Industries: An Annual Summary of the State's Economic Geology

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STATE OF OHIO
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DIVISION OF GEOLOGICAL SURVEY
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PREFACE

The *2018 Report on Ohio Mineral Industries* continues in the efforts of the ODNR Division of Geological Survey to present a clear and concise representation of mining production, sales, and employment for Ohio's mineral industry commodities. This report continues in the simplified and concise format, where a discussion of each geologic commodity is presented in a bulleted format to make viewing and obtaining the desired data easier for the user. This format parallels the digital commodity summaries that are available on the Division's website. Percent change comparisons of 2018 production and sales values for each commodity with those of the previous year are notated, with the 2017 data coming from the 2017 edition of this report (Wright and Stucker, 2018).

The *Map of Active Mineral Industry Operations in Ohio* is included at the end of the report and continues to act as a standalone product. The map includes a table with information about each labeled point, including the company name and total combined tonnage of material(s) mined at each operation location.

The appendices are not included within the report and are instead available as downloadable files at **http://geosurvey.ohiodnr.gov/economic-geology/mineral-industry-summaries**. These appendices include data for all commodities categorized by company, commodity, and county. Digital versions of these appendices allow users to view and organize data in a way that is convenient to them, which has been a feature widely requested by report users.

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Geologist

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2018 OHIO ECONOMIC GEOLOGY IN BRIEF

The total tonnage of coal and industrial minerals produced in Ohio during 2018 was 113,037,754 tons or approximately 9.7 tons per capita. The total value[1] of coal was $379,576,872 in 2018; the value[1] of oil and gas was $8,374,209,575; and the value[1] of all nonfuel industrial minerals was $1,183,675,048 in 2018 (figs. 1, 2, 3; table 1). The combined value of fuel and nonfuel minerals produced in Ohio during 2018 was $9,937,461,495 or approximately $850 per capita.

Reported and estimated total direct employment in the extractive industries of Ohio in 2018 was more than 10,000 people. Industrial-mineral production decreased for all commodities except limestone and dolomite. The total value of nonfuel industrial minerals exceeded $1 billion for the fifth straight year. In 2018, production for the leading commodity of limestone and dolomite was up 4.7%, while the second leading commodity of sand and gravel was down 2.1%, and the third leading commodity of coal was down 6.4% from 2017 values. In 2018, clay, shale, salt, and sandstone and conglomerate commodities production were all down by double digit percentages.

[1] Includes reported and estimated values. Some operations reporting sales did not report a value for those sales. A countywide- or statewide-average price per ton was calculated for each industrial-mineral commodity based on sales for which the value was reported. A countywide, average price per ton was calculated for coal based on sales for which the value was reported and method of production. These calculated averages were used to estimate the value of the sales for which the actual values were not reported.

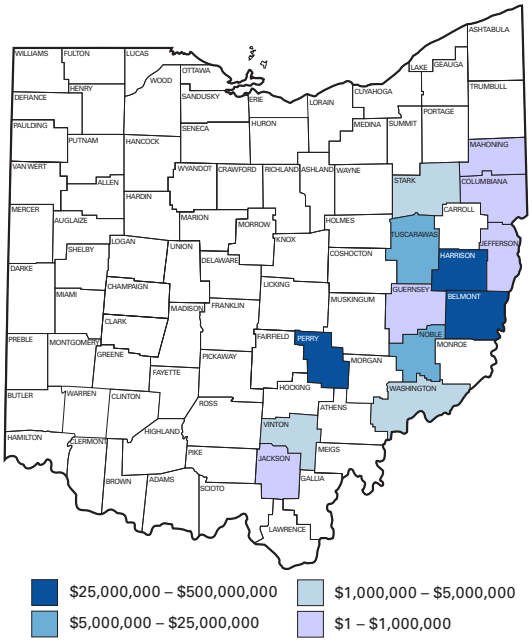

FIGURE 1. Total value of coal sold in Ohio in 2018, by county.

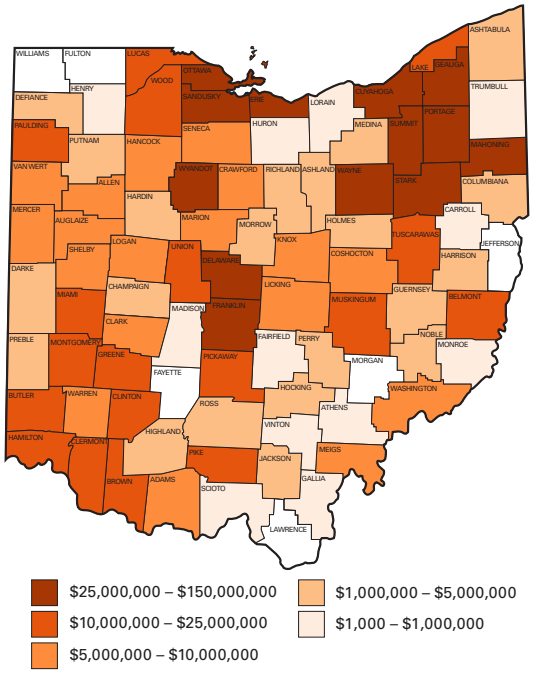

FIGURE 2. Total value of industrial minerals sold in Ohio in 2018, by county.

TABLE 1. *Fuel and nonfuel mineral sales and production in Ohio in 2018*

Commodity	Production[1]	Sales[2]	Value[3]	Change in value from 2017 (percent)
Limestone and dolomite	65,458,961 tons	64,821,047 tons	$654,299,122	+ 6.6
Coal	9,613,912 tons	9,882,346 tons	$379,576,872	– 0.8
Sand and gravel	31,700,708 tons	31,435,724 tons	$245,606,387	+ 1.4
Salt	3,835,221 tons	3,909,206 tons	$218,146,674	+ 11.7
Sandstone and conglomerate	1,243,043 tons	1,169,811 tons	$48,203,968	– 5.9
Shale	443,552 tons	524,129 tons	$11,506,384	– 17.2
Clay	742,357 tons	667,978 tons	$5,912,513	– 33.7
Gas	2,398,386,763 thousand cubic feet	not available	$7,003,289,348	+ 41.2
Oil	22,795,481 barrels	not available	$1,370,920,227	+44.4

[1] The production figures for industrial minerals are estimates, as many operators do not know actual production. For those operators that do not report production, production is assumed equal to sales or estimated from ODNR Division of Mineral Resources Management records.

[2] Includes material for captive use.

[3] The FOB value of industrial minerals sold was estimated for mines that failed to report this information and for those producing material for captive use. These estimates were calculated using a countywide- or statewide-average price per ton calculated using reported FOB values.

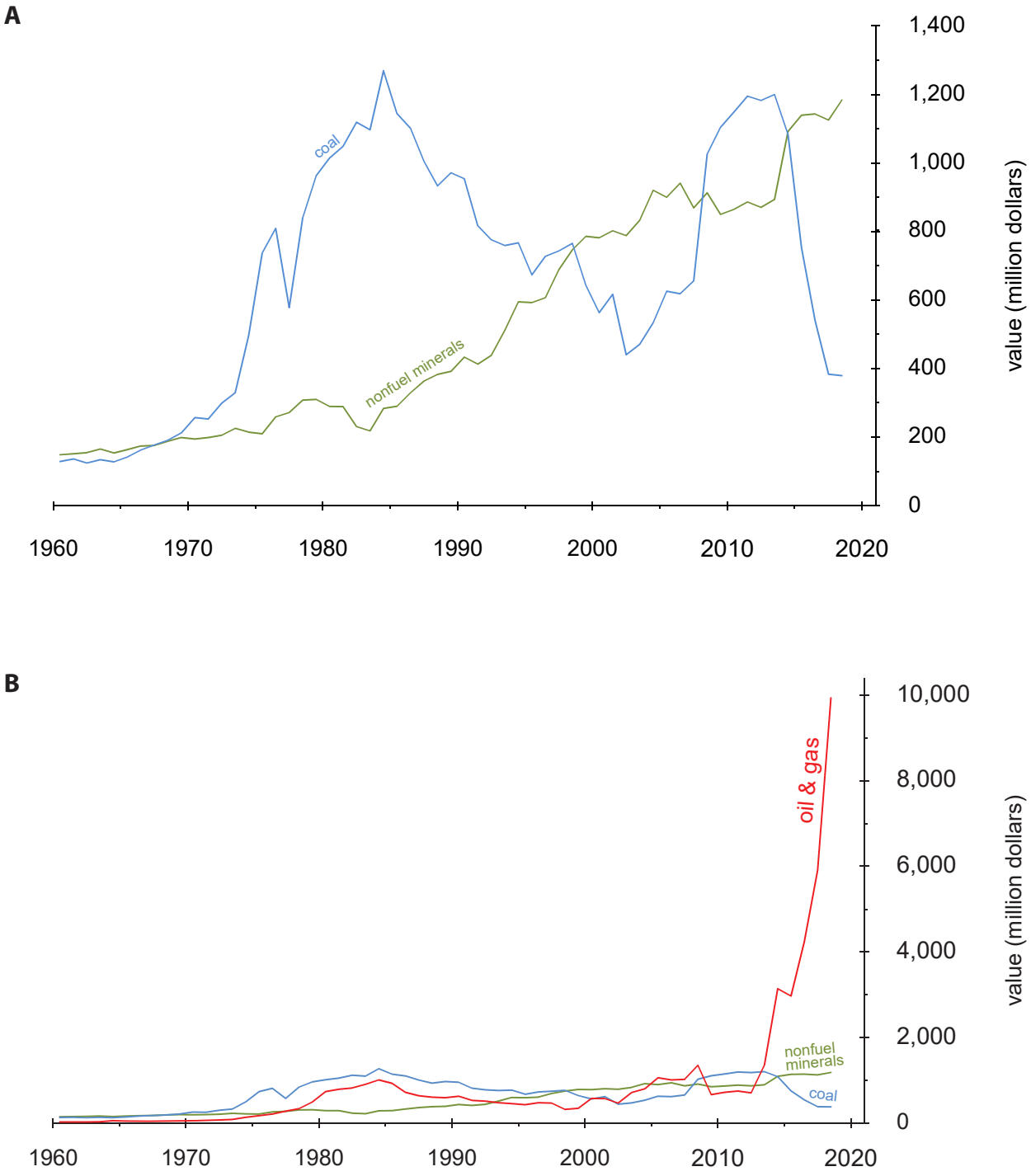

FIGURE 3. (A) Value of coal and nonfuel minerals in Ohio since 1960. (B) Value of coal, nonfuel minerals, and oil and gas in Ohio since 1960.

COAL

Directory of operators available at:
http://geosurvey.ohiodnr.gov/economic-geology/economic-geology-home

Coal was first recognized in Ohio by pioneers during the 1740s, and the first map of Ohio coal deposits was made in 1752 (Crowell, 1995). Coal production first occurred in Jefferson County during 1800 and amounted to 100 tons. Columbiana County was the next to report coal production starting in 1803 (Crowell, 1995). Since that time, nearly 4 billion tons of coal have been mined from coal seams in the state (Crowell, 1995); this represents a value of more than $200 billion in 2018 dollars.[2]

Throughout 2018, there were two surface mine and three underground mine expansion permits issued. There were three new permits issued with two new surface mines, and one new underground mine. Several coal operations ceased or curtailed production in 2018 because of less-expensive, competing natural gas and decreased demand.

[2]The following link will provide more information about the formation and uses of Ohio's coal resources:
http://geosurvey.ohiodnr.gov/rocks-and-minerals/online-rock-and-mineral-kit

Production

- Tons produced = 9,613,912 (–6.4% from 2017)
- U.S. ranking
  - 15th out of 23 producing states (USDOE, 2019)
- Leading counties (percentage of statewide production):
  - Belmont (55.0%)
  - Harrison (19.1%)
  - Perry (16.3%)
  - Noble (3.5%)
- Top producing seams (table 5):
  - Pittsburgh (No. 8)
  - Middle Kittanning (No. 6)
  - Meigs Creek (No. 9)

Sales

(see fig. 6 and tables 2, 6, 7)

- Tons sold = 9,882,346 (+1.2% from 2017)
- Value = $379,576,872

Employment

(see table 8)

- Production employees reported = 676
- Nonproduction employees reported = 378
- Average employee wages:
  - Surface-mine production = $52,855
  - Underground-mine production = $89,409
- Total wages earned = $101,156,928

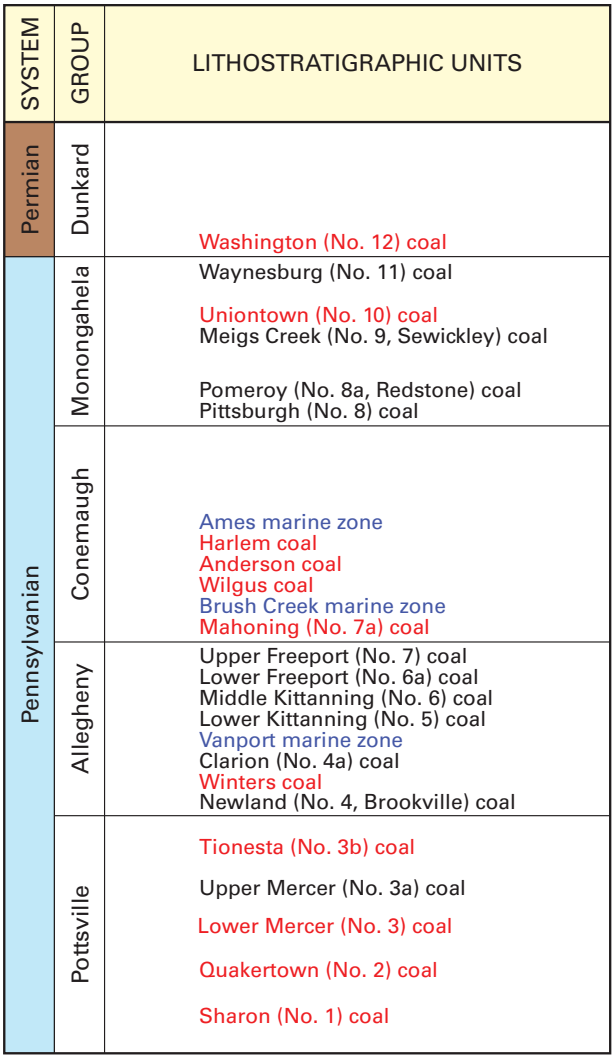

FIGURE 4. Stratigraphic column of coals mined in Ohio during 2018 (black), other significant coal beds (red), and associated key beds (blue) used for stratigraphic correlation. Modified from Brant and Delong (1960, table 9), Collins (1979, fig. 3), and Larsen (1991, fig. 2).

TABLE 2. ***2018 Ohio coal production and sales by county, in descending order of production***

County	Production (short tons)	Sales (short tons)
Belmont	5,284,696	6,018,426
Harrison	1,832,411	1,895,944
Perry	1,563,560	1,080,252
Noble	336,439	336,439
Tuscarawas	243,911	245,234
Vinton	205,866	157,241
Stark	69,653	71,434
Washington	59,617	59,617
Jefferson	8,685	8,685
Mahoning	5,627	5,627
Jackson	3,257	3,257
Columbiana	187	187
Guernsey	3	3
TOTAL	9,613,912	9,882,346

TABLE 3. ***2018 Ohio coal production, by production size group and change from 2017***

Production size group	2018		Change from 2017 (short tons)
	Number of mines reporting	Production (short tons)	
1,000,000 tons and over	2	6,178,671	502,031
500,000 to 999,999 tons	1	589,599	–1,375,020
250,000 to 499,999 tons	4	1,484,091	413,220
100,000 to 249,999 tons	5	714,886	–416,342
50,000 to 99,999 tons	7	499,221	233,156
25,000 to 49,999 tons	2	84,409	–21,552
Less than 25,000 tons	18	63,035	7,461
TOTAL	39	9,613,912	–657,046

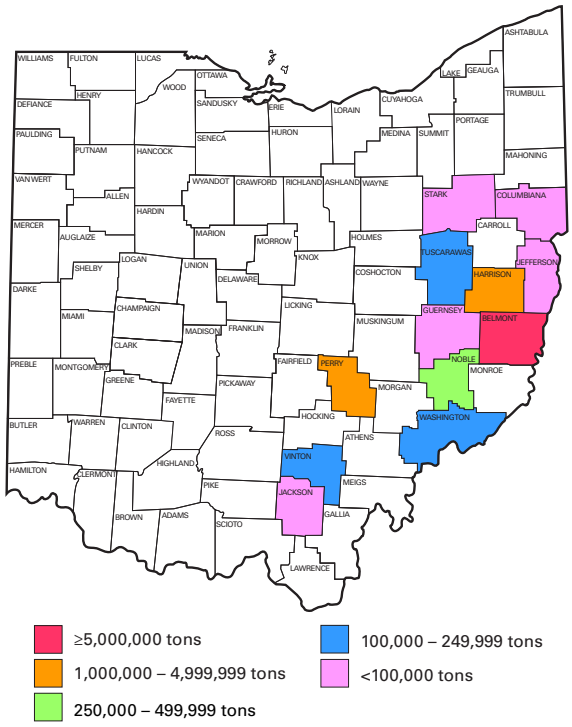

FIGURE 5. Coal production in Ohio in 2018, by county and quantity.

TABLE 4. ***2018 Ohio coal production, by county and mining method***

County	All methods (short tons)	Total number of mines	Underground				Surface				
			Number of mines reporting	Production (short tons)			Number of mines reporting	Production (short tons)			
				Total	Longwall	Continuous miner		Total	Strip	Auger	Highwall
Belmont	5,284,696	5	1	4,785,568	4,354,126	431,442	4	499,128	305,216	3,641	190,271
Columbiana	187	1					1	187	187		
Guernsey	3	1					1	3	3		
Harrison	1,832,411	7	2	672,292		672,292	5	1,160,119	1,124,602	35,517	
Jackson	3,257	2					2	3,257	3,257		
Jefferson	8,685	1	1	8,685		8,685					
Mahoning	5,627	2					2	5,627	5,627		
Noble	336,439	4					4	336,439	336,439		
Perry	1,563,560	3	1	1,393,103		1,393,103	2	170,457	163,800	6,657	
Stark	69,653	2					2	69,653	51,165	6,610	11,878
Tuscarawas	243,911	8	1	162,874		162,874	7	81,037	81,037		
Vinton	205,866	2					2	205,866	154,282		51,584
Washington	59,617	1					1	59,617	59,617		
TOTAL[1]	9,613,912	39	6	7,022,522	4,354,126	2,668,396	33	2,591,390	2,285,232	52,425	253,733

[1]Any tally inconsistencies are because of rounding of production tonnages.

TABLE 5. *2018 Ohio coal production, by county and seam*

County[1]	Production (short tons)											
	Total	Upper Mercer (No. 3a)	Newland (No. 4, Brookville)	Clarion (No. 4a)	Lower Kittanning (No. 5)	Middle Kittanning (No. 6)	Lower Freeport (No. 6a)	Upper Freeport (No. 7)	Pittsburgh (No. 8)	Pomeroy (No. 8a, Redstone)	Meigs Creek (No. 9, Sewickley)	Waynesburg (No. 11)
Belmont	5,284,696								5,189,493		54,778	40,425
Columbiana	187							187				
Guernsey	3										3	
Harrison	1,832,411						361,457	310,835	811,926	229,645	118,548	
Jackson	3,257		2,026		1,231							
Jefferson	8,685						8,685					
Mahoning	5,627				5,627							
Noble	336,439										336,439	
Perry	1,563,560				2,577	1,560,983						
Stark	69,653				4,709	62,217	2,727					
Tuscarawas	243,911	551	15,792		43,336	184,232						
Vinton	205,866			144,261	31,545	13,141	16,919					
Washington	59,617										59,617	
TOTAL[2]	9,613,912	551	17,818	144,261	89,025	1,820,573	389,788	311,022	6,001,419	229,645	569,385	40,425

[1]Production from mines operating in more than one county was evenly split between the counties involved unless a county-specific breakdown was provided by the operator.
[2]Any tally inconsistencies are because of rounding of production tonnages.

TABLE 6. *2018 Disposition of Ohio coal, by county*

County[1]	Number of mines	Disposition[1] (short tons)					Stored
		Total[2]	Rail	Water	Truck	Conveyor	
Belmont	5	6,018,426	4,399,228		1,619,198		92,165
Columbiana	1	187			187		
Guernsey	1	3			3		
Harrison	7	1,895,944	423,581		1,472,363		14,070
Jackson	2	3,257			3,257		
Jefferson	1	8,685			8,685		
Mahoning	2	5,627			5,627		
Noble	4	336,439			336,439		
Perry	3	1,080,252	900,121		180,131		
Stark	2	71,434			71,434		
Tuscarawas	8	245,234	32,535		212,699		
Vinton	2	157,241			157,241		40
Washington	1	59,617			59,617		
TOTAL[3]	39	9,882,346	5,755,465	0	4,126,881	0	106,275

[1]Tonnage of coal shipped from mines operating in more than one county was evenly split between the counties involved and type(s) of disposition reported unless county-specific information was provided by the operator.
[2]Does not reflect tonnage stored. Reflects tonnage sold and shipped from mine.
[3]Any tally inconsistencies are because of rounding.

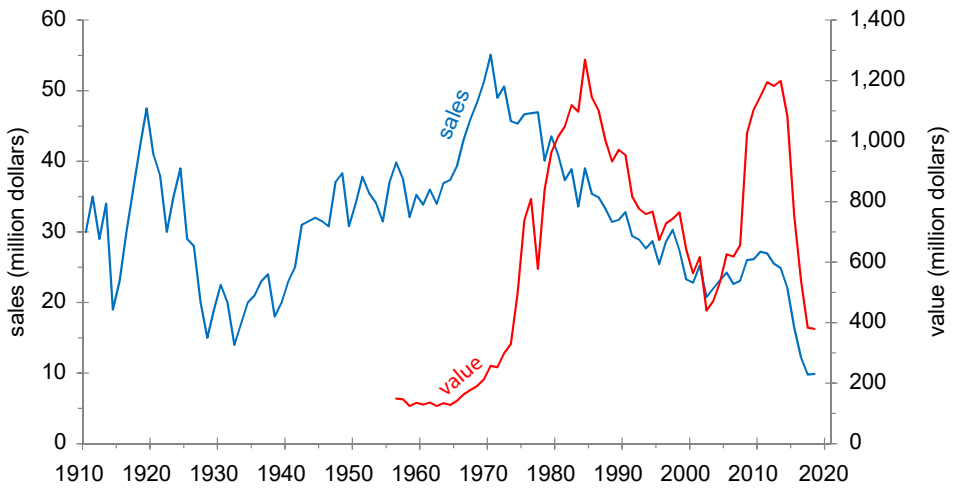

FIGURE 6. Sales and value of coal in Ohio since 1910.

TABLE 7. ***2018 Dollar value of coal at mine, by county and mining method***

County[1]	Total				Underground				Surface			
	No. of mines	Tonnage sold (short tons)	Value at mine[2] (dollars)	Per ton average (dollars)	No. of mines	Tonnage sold (short tons)	Value at mine[1] (dollars)	Per ton average (dollars)	No. of mines	Tonnage sold (short tons)	Value at mine[1] (dollars)	Per ton average (dollars)
Belmont	5	6,018,426	$210,354,738	$34.95	1	5,508,178	$193,324,741	$35.10	4	510,248	$17,029,997	$33.38
Columbiana	1	187	$5,797	$31.00					1	187	$5,797	$31.00
Guernsey	1	3	$84	$28.00					1	3	$84	$28.00
Harrison	7	1,895,944	$76,733,963	$40.47	2	686,362	$31,020,321	$45.20	5	1,209,582	$45,713,642	$37.79
Jackson	2	3,257	$62,477	$19.18					2	3,257	$62,477	$19.18
Jefferson	1	8,685	$484,430	$55.78	1	8,685	$484,430	$55.78				
Mahoning	2	5,627	$182,008	$32.35					2	5,627	$182,008	$32.35
Noble	4	336,439	$11,102,487	$33.00					4	336,439	$11,102,487	$33.00
Perry	3	1,080,252	$62,026,849	$57.42	1	900,121	$54,344,816	$60.38	2	180,131	$7,682,033	$42.65
Stark	2	71,434	$3,518,175	$49.25					2	71,434	$3,518,175	$49.25
Tuscarawas	8	245,234	$9,575,688	$39.05	1	162,874	$7,980,826	$49.00	7	82,360	$1,594,862	$19.36
Vinton	2	157,241	$3,562,815	$22.66					2	157,241	$3,562,815	$22.66
Washington	1	59,617	$1,967,361	$33.00					1	59,617	$1,967,361	$33.00
TOTAL	39	9,882,346	$379,576,872	$38.41	6	7,266,220	$287,155,134	$39.52	33	2,616,126	$92,421,738	$35.33

[1]Sales reported from mines operating in more than one county were evenly split between the counties involved unless county-specific information was provided by the operator.
[2]The FOB value of coal sold was estimated for those mines that failed to report this information. These estimates were calculated using a statewide-average price per ton by mining method, based on reported FOB values deemed to be reliable.

TABLE 8. ***2018 Wage and salary payments to Ohio coal mine employees, by county and occupational group***

County[1]	Wage and salary payments (nearest whole dollar)[2]			
	All occupations	Underground production employees	Surface production employees	Other
Belmont	$87,581,862	$28,732,719	$3,713,359	$55,135,784
Guernsey	$995,333		$557,424	$437,909
Harrison	$15,209,517	$7,388,467	$4,610,623	$3,210,427
Jefferson	$419,713			$419,713
Mahoning	$113,016		$113,016	
Noble	$2,825,181		$2,825,181	
Perry	$1,420,861		$758,809	$662,052
Stark	$683,993		$451,869	$232,124
Tuscarawas	$804,278		$355,171	$449,107
Vinton	$1,340,712		$638,774	$701,938
Washington	$352,437		$352,437	
TOTAL[3]	$111,746,903	$36,121,186	$14,376,663	$61,249,054

[1]For those operations reporting activity in more than one county, wage and salary payments were evenly split between the counties involved unless county-specific information was provided by the operator.
[2]For those operations reporting only a total wage and salary payment for all workers, an equal pay rate was assumed for all employees. In cases where quarterly employment was reported but wage and salary payments were not, wage and salary payments for that quarter were estimated from reported payments in the other quarters to arrive at the annual figure.
[3]Any tally inconsistencies are because of rounding.

INDUSTRIAL MINERALS

Directory of operators available at: **http://geosurvey.ohiodnr.gov/economic-geology/economic-geology-home**

Industrial minerals are nonmetallic, nonfuel rocks or minerals that have economic value and are essential to modern society. Industrial minerals have been mined or quarried in Ohio since the establishment of early settlements and include limestone, dolomite, sand, gravel, sandstone, conglomerate, clay, shale, salt, gypsum, and peat. Hundreds of construction projects and industrial products rely on the availability of industrial minerals.

The production of multiple commodities is important to the economic success of mine operations in many areas of Ohio. The production of sand and gravel along with clay is often located in glaciated portions of northern and western Ohio, where deposits of sand and gravel can occur with clay-rich glacial tills. The Pennsylvanian-age cyclic sedimentation in eastern Ohio includes coals, clays, shales, and limestones in close proximity, allowing for economic recovery of multiple commodities.[3]

Industrial minerals were reported as produced or sold at 345 operations, in 80 Ohio counties during 2018. The combined value of all industrial minerals sold in 2018 was $1,183,675,048 (table 9). This is the fifth consecutive year that the combined value of all nonfuel minerals has exceeded one billion dollars. The statewide combined employment for all nonfuel industrial mineral extraction was 4,211 employees (table 10).

[3]The following links will provide more information on the general bedrock and glacial geology of Ohio:
http://geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/BedrockGeology/BG-1_8.5x11.pdf
http://geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/Glacial/glacial.pdf

TABLE 9. ***2018 Value of Ohio industrial minerals***

Commodity	Sales (tons)	Change from 2017 (tons/percent)	Value[1]	Percent of total value
Limestone and dolomite	64,821,047	+2,617,510/+4.2	$654,299,122	55.3
Sand and gravel	31,435,724	–404,592/–1.3	$245,606,387	20.7
Salt	3,909,206	–526,291/–11.9	$218,146,674	18.4
Sandstone and conglomerate	1,169,811	–465,065/–28.4	$48,203,968	4.1
Shale	524,129	–108,011/–17.1	$11,506,384	1.0
Clay	667,978	–105,957/–13.7	$5,912,513	0.5
Total	102,527,895	+1,007,594/+1.0	$1,183,675,048	100.0

[1]The FOB value of industrial minerals sold was estimated for those mines that failed to report this information and for those producing material for captive use. These estimates were calculated using a countywide- or statewide-average price per ton based on reported FOB values.

TABLE 10. ***2018 Employment at Ohio industrial-mineral operations, by county***

County	Total Employees[2]	Production Employees	Nonproduction Employees
Adams	19	8	11
Allen	17	8	9
Ashland	17	11	6
Ashtabula	7	5	2
Athens	9	5	4
Auglaize	8	5	3
Belmont	92	37	55
Brown	30	16	14
Butler	145	51	94
Carroll	1	1	0
Champaign	10	5	5
Clark	8	5	3
Clermont	42	35	7
Columbiana	16	11	5
Coshocton	27	19	8
Crawford	14	14	0
Cuyahoga	224	164	60
Darke	10	7	3
Defiance	25	19	6
Delaware	26	26	0
Erie	112	90	22
Fairfield[1]	0	0	0
Franklin	151	95	56
Gallia	1	1	0
Geauga	76	58	18
Greene	56	40	16
Guernsey	64	44	20
Hamilton	101	50	51
Hancock	7	7	0
Hardin	17	7	10
Harrison	2	2	0
Henry[1]	0	0	0
Highland	28	23	5
Hocking	23	19	4
Holmes	34	19	15
Huron	1	1	0
Jackson	27	13	14
Knox	66	44	22
Lake	103	67	36
Licking	35	22	13

TABLE 10. ***2018 Employment at Ohio industrial-mineral operations, by county (cont.)***

County	Total Employees[2]	Production Employees	Nonproduction Employees
Logan	60	36	24
Lorain	4	3	1
Lucas	56	43	13
Madison	6	3	3
Mahoning	103	65	38
Marion	14	11	3
Meigs	22	16	6
Mercer	34	21	13
Miami	55	38	17
Monroe	8	8	0
Montgomery	49	35	14
Morrow	5	5	0
Muskingum	61	49	12
Noble	17	15	2
Ottawa	109	86	23
Paulding	42	38	4
Perry	10	7	3
Pickaway	589	15	574
Pike	30	29	1
Portage	138	94	44
Preble	28	17	11
Putnam	5	5	0
Richland	26	21	5
Ross	24	15	9
Sandusky	214	192	22
Scioto	1	1	0
Seneca	67	14	53
Shelby	18	14	4
Stark	112	85	27
Summit	91	1	90
Trumbull	8	6	2
Tuscarawas	115	60	55
Union	57	42	15
Van Wert	25	21	4
Warren	28	20	8
Washington	60	17	43
Wayne	53	41	12
Williams[1]	0	0	0
Wood	90	64	26
Wyandot	126	96	30
TOTAL 80 counties	4,211	2,403	1,808

[1] Counties where commodities were extracted, but no employment information was provided are represented with zeros in the employment fields.

[2] Any tally inconsistencies are because of computer rounding produced by partial-year employment.

LIMESTONE AND DOLOMITE

Directory of operators available at:
http://geosurvey.ohiodnr.gov/economic-geology/economic-geology-home

Limestone and dolomite are Ohio's most versatile industrial minerals. Both are used by the construction industry as aggregate, as an essential ingredient in the cement industry, to produce lime, as a flux in the steel and glass industries, as filler in a multitude of products, as an agricultural supplement, in water purification, and as a building stone. Ohio has long been a national leader in the production of lime and construction aggregates.

Devonian and Silurian-age carbonates located in the western half of Ohio are the primary geologic units producing crushed stone. Pennsylvanian and Mississippian-age limestones are important sources of aggregate in local markets of eastern Ohio (Stout, 1941; Lamborn, 1951).

Production

- Tons produced = 65,458,961 (+4.7% from 2017)
- U.S. ranking
  - 5th out of 50 producing states for crushed stone (USGS, 2019a)
  - 4th out of 28 producing states for lime (USGS, 2019b)
- Top Producing Geologic Units (fig. 7):
  - Columbus/Delaware Limestones (Devonian)
  - Lockport Dolomite (Silurian)
  - Greenfield/Tymochtee Dolomites (Silurian)
  - Brassfield Formation (Silurian)

Sales
(See figs. 8 , 9)

- Tons sold = 62,821,047 (+4.2% from 2017; table 11, 12)
- Value[4] = $654,299,122 (table 9)
- Leading counties (percentage of statewide sales):
  - Wyandot (11.7%)
  - Franklin (11.7%)
  - Ottawa (7.1%)
  - Erie (7.1%)

Employment
(See table 10)

- Production employees reported = 1,320
- Nonproduction employees reported = 577
- Average employee annual wage = $51,651
- Total wages earned = $75,965,352
- Average days worked per operation = 196

[4]Includes reported and estimated values. See footnote 1, p. 1.

SYSTEM	GROUP	LITHOSTRATIGRAPHIC UNITS
Pleistocene		Glacial clay Glacial sand and gravel
Permian	Dunkard	
Pennsylvanian	Monongahela	Fishpot limestone Redstone limestone
	Conemaugh	Bellaire sandstone Ames limestone Buffalo sandstone Brush Creek limestone
	Allegheny	Upper Freeport sandstone Lower Kittanning clay Vanport limestone Clarion shale Putnam Hill limestone
	Pottsville	Newland-Brookville clay Tionesta clay Middle Mercer clay Massillon sandstone Sharon conglomerate
Mississippian		Maxville Limestone Logan Formation Black Hand Sandstone Buena Vista Sandstone
Devonian		Berea Sandstone Bedford Shale Ohio Shale Chagrin Member Ten Mile Creek Dolomite Dundee Limestone Delaware Limestone Columbus Limestone
	Detroit River	
Silurian	Salina	Salina Dolomite "Salt beds"
		Tymochtee Dolomite Greenfield Dolomite Peebles Dolomite Cedarville Dolomite Lockport Dolomite Laurel Limestone Dayton Limestone Brassfield Formation
Ordovician	Cincinnati	
	Black River	Black River Limestone

FIGURE 7. Stratigraphic column of nonfuel industrial minerals mined in Ohio during 2018. Modified from Brant and Delong (1960, table 9), Ohio Division of Geological Survey (1990), and Slucher and others (2006).

TABLE 11. ***2018 Ohio limestone and dolomite sales, by county and use***

County	Tons sold														
	Total all types	Crushed and broken stone										Dimension stone	Stone for portland cement manufacture	Agricultural stone (aglime)	Raw stone for burning
		Total	Riprap	Flux stone	Stone for portland cement concrete	Stone for asphaltic concrete	Road construction/ resurfacing	Commercial building	Railroad ballast	Extenders/ fillers	Unspecified/ other				
Adams	886,188	886,188									886,188				
Allen	782,710	778,201	3,814		95,461	184,249	62,301	32,088	7,000		393,288			4,509	
Auglaize	688,504	688,499	4,588		79,974	51,000	65,040	116,357			371,540			5	
Belmont	1,464,506	1,464,506	85,958				768,049				610,499				
Brown	1,566,094	1,566,094									1,566,094				
Butler	63,941	63,941									63,941				
Clark	44	44					44								
Clermont	1,893,350	1,879,350	350		34,000	346,000		1,499,000						14,000	
Clinton	1,673,297	1,664,489	41,374		60,435	599,239	573,473	312,502	10,348		67,118			8,808	
Columbiana	116	116	116												
Coshocton	20,001	20,001					20,001								
Crawford	971,000	893,000	9,000		252,000	263,000					369,000			78,000	
Darke	338,004	338,004	1,209		12,352	33,712	84,283	206,448							
Delaware	2,956,000	2,941,000	77,000		430,000	345,000					2,089,000			15,000	
Erie	4,577,518	4,496,365	61,909		506,448	321,323	778,940				2,827,745	2,212		78,941	
Franklin	7,585,619	7,572,304	3,554		448,142	325,455	144,214	1,609,734			5,041,205			13,315	
Greene	1,336,413	1,336,413			744,621	4,264	42,949				544,579				
Guernsey	300,508	300,508					300,508								
Hamilton	12,504	12,504									12,504				
Hancock	925,000	925,000	14,000		28,000	121,000			12,000		750,000				
Hardin	193,131	193,131									193,131				
Harrison	388,556	388,556					388,556								
Highland	438,664	431,919	7,557			48,339	246,301	108,122			21,600			6,745	
Hocking	11,994	11,994			4,283	5,910	1,801								
Holmes	7,768	7,768					7,768								
Jackson	325,436	325,436	13,579								311,857				
Knox	10,169	10,169					1,558	8,611							
Licking	2,610	2,610					322	2,288							
Logan	823,413	823,413	39,833		273,139		28,452	227,615			254,374				
Lucas	1,993,836	1,993,836									1,993,836				
Mahoning	2,352,914	2,352,914	2,172				643,176				1,707,566				
Marion	439,000	439,000	5,000		59,000	70,000					305,000				
Mercer	702,294	702,294									702,294				
Miami	1,303,215	1,258,258	3,714	10,342	43,027		266,281	588,894			346,000			44,957	
Monroe	48,339	48,339					48,339								

TABLE 11. ***2018 Ohio limestone and dolomite sales, by county and use (cont'd.)***

County	Tons sold														
	Total all types	Crushed and broken stone										Dimension stone	Stone for portland cement manufacture	Agricultural stone (aglime)	Raw stone for burning
		Total	Riprap	Flux stone	Stone for portland cement concrete	Stone for asphaltic concrete	Road construction/ resurfacing	Commercial building	Railroad ballast	Extenders/ fillers	Unspecified/ other				
Montgomery	880,153	880,153			129,321		263,015				487,817				
Muskingum	1,110,697	1,110,697	134,733								975,964				
Noble	272,281	272,281	648				110,962				160,671				
Ottawa	4,624,097	4,400,144	125,405		435,323	167,417	2,131,493	75,000		17,000	1,448,506				223,953
Paulding	1,166,415	609,450									609,450		556,965		
Perry	203,208	203,208									203,208				
Pickaway	207,744	207,744	6,000		60,000	100,000	15,000	15,000	5,000		6,744				
Pike	1,054,314	1,035,314	96,000		300,000	300,000	200,000	100,000	5,000		34,314			19,000	
Portage	650	650					300				350				
Putnam	481,000	481,000	3,000		88,000	40,000					350,000				
Ross	260,125	260,125					150,000	80,000			30,125				
Sandusky	3,215,626	1,151,942	4,101		276,006	82,605	206,808	191,079			391,343			13,533	2,050,151
Seneca	1,197,519	383,956	5,006		84,182		24,279			723	269,766	5,897		18,891	788,775
Shelby	666,000	666,000									666,000				
Tuscarawas	248,997	248,997	21,171				214,810				13,016				
Union	2,145,406	2,145,406									2,145,406				
Van Wert	615,642	615,642			27,000						588,642				
Wayne	2,689	2,665					2,665							24	
Wood	1,789,512	1,781,265	37,384		53,965	438,903	546,945	351,677		1,699	350,692			8,247	
Wyandot	7,596,316	7,557,316	60,000	32,000	1,384,826	596,878	74,613	335,387	4,000	229,000	4,840,612			39,000	
TOTAL	64,821,047	60,830,119	868,175	42,342	5,909,505	4,444,294	8,413,246	5,859,802	43,348	248,422	35,000,985	8,109	556,965	362,975	3,062,879

TABLE 12. ***2018 Production of lime from Ohio, by county and use***

County	Total tons[1]	Building (tons)	Chemical and industrial (tons)	Refractory (tons)
Ottawa	101,797	64,760	37,037	
Sandusky	891,370		891,370	
Seneca	352,742		352,742	
TOTAL	1,345,909	64,760	1,281,149	0

[1]Burning produced a 43.9% weight loss.

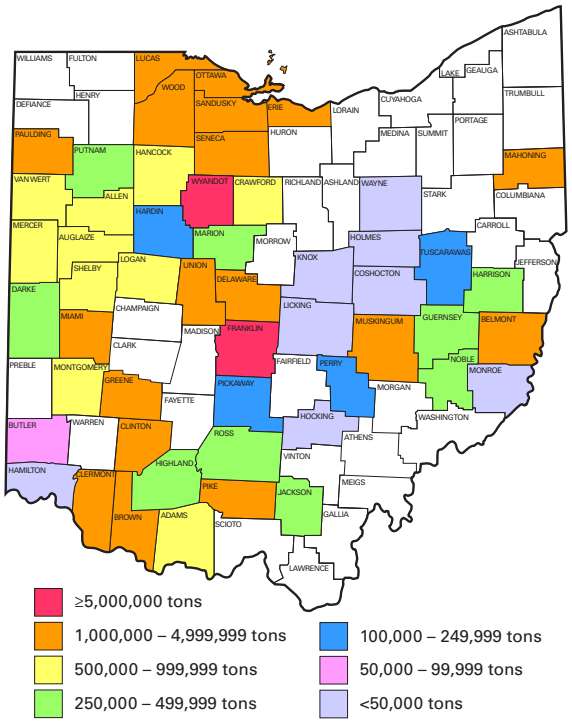

FIGURE 8. Sales of limestone and dolomite in Ohio in 2018, by county and quantity.

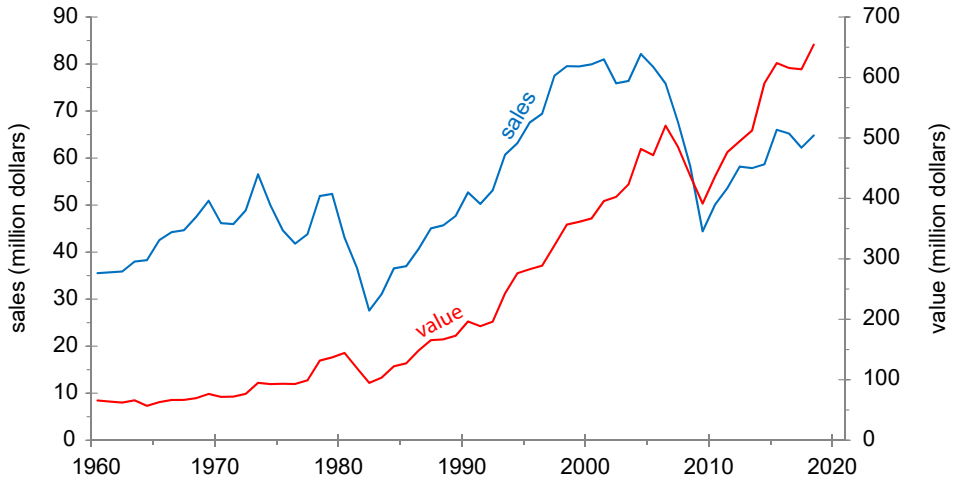

FIGURE 9. Sales and value of limestone and dolomite in Ohio.

SAND AND GRAVEL

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Sand and gravel are common raw materials that are major constituents of asphalt, concrete, mortar, landscaping, roofing shingles, soil additives, and many other products. Sand-and-gravel production increased rapidly in Ohio beginning in the 1950s with the development of improved mining and processing machinery and increased demand from road building (Ohio Division of Geological Survey, 1959). Many depleted sand-and-gravel operations have been redeveloped as parks, residential spaces, or commercial facilities because of their proximity to urban areas.

Sand-and-gravel deposits in Ohio primarily are associated with Wisconsinan-age glacial outwash and kame terraces in the valleys and tributaries of the Great Miami, Scioto, and Muskingum Rivers located in the southwestern, central, and eastern portions of the state, respectively. Important sand-and-gravel deposits also are found in glacial kames in northeastern Ohio, beach ridges associated with ancestral Lake Erie, and alluvium of modern floodplains of the Ohio River and its tributaries.

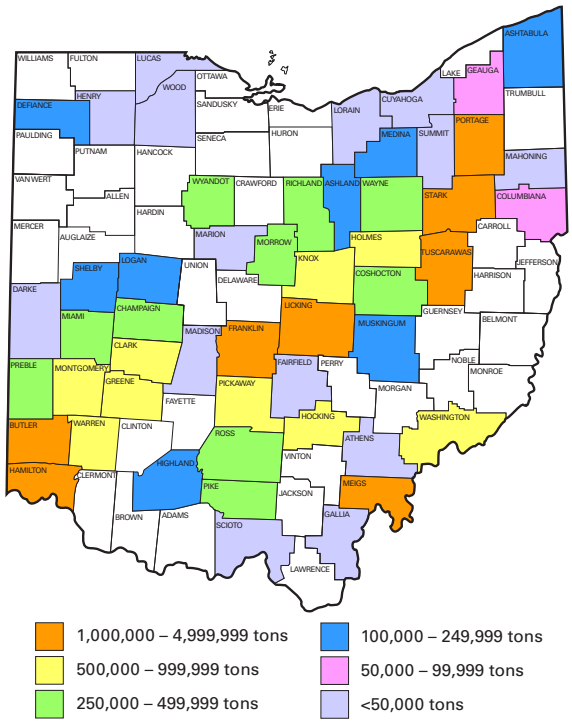

FIGURE 10. Sales of sand and gravel in Ohio in 2018, by county and quantity.

Production

- Tons produced = 31,700,708 (–2.1% from 2017)
- U.S. ranking
  - 8th out of 50 producing states (USGS, 2019c)

Sales

(See figs. 10, 11)

- Tons sold = 31,435,724 (–1.3% from 2017; table 13)
- Value[5]= $245,606,387 (table 9)
- Leading counties (percentage of statewide sales):
  - Stark (12.8%)
  - Butler (10.6%)
  - Portage (10.1%)
  - Hamilton (9.0%)
  - Franklin (5.2%)

Employment

(See table 10)

- Production employees reported = 1,036
- Nonproduction employees reported = 1,147
- Average employee annual wage = $53,872
- Total wages earned = $77,134,254
- Average days worked per operation = 158

[5] Includes reported and estimated values. See footnote 1, p. 1

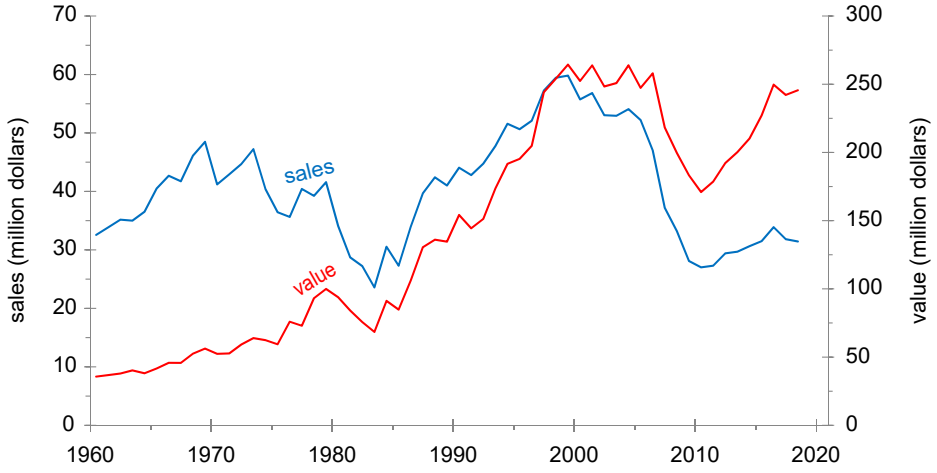

FIGURE 11. Sales and value of sand and gravel in Ohio.

TABLE 13. ***2018 Ohio sand and gravel sales, by county and use***

County	Tons sold															
	Total sand and gravel	Total sand	Total gravel	Building		Portland cement concrete		Asphaltic concrete		Road construction/ resurfacing		Filtration		Foundry sand	Industrial sand	Other/unspecified	
				Sand	Gravel	Sand	Gravel	Sand	Gravel	Sand	Gravel	Sand	Gravel			Sand	Gravel
Ashland	243,671	80,746	162,925	24,224	48,878					48,447	97,755					8,075	16,292
Ashtabula	133,335	71,247	62,088	56,698	62,075	8,856		5,680								13	13
Athens	16,076	10,513	5,563	10,513	5,563												
Butler	3,339,881	1,540,595	1,799,286	351,321	603,048	377,983	240,950				158,189					811,291	797,099
Champaign	274,134	107,792	166,342	10,494	50,873	49,971	22,984			403	20,274					46,924	72,211
Clark	862,230	468,842	483,766	8,401	45,805	97,400	92,631	71,656	71,104	43,540	26,380					247,845	247,846
Columbiana	77,005	40,457	36,548							1,859				1,409	3,115	34,074	36,548
Coshocton	419,121	285,957	133,164	11,804	18,532					558	47,937		350			273,595	66,345
Cuyahoga	28,487	14,244	14,243													14,244	14,243
Darke	30,000	25,000	5,000	25,000	5,000												
Defiance	193,572	173,396	20,176	13,168	15,993	160,228											4,183
Fairfield	3,238	2,317	921													2,317	921
Franklin	1,643,500	961,697	681,803	45,400	285,201	626,923	57,047	35,284	16,926		66,256					254,090	256,373
Gallia	2,010	2,010														2,010	
Geauga	81,406	40,702	40,704													40,702	40,704
Greene	839,502	368,782	581,564	11,200	9,700	21,780	24,200	52,960	23,100	59,170	4,000					223,672	520,564
Hamilton	2,841,685	1,623,297	1,218,388	641,056	664,122	331,045	192,787				64,955					651,196	296,524
Henry	4,135	4,135										500			1,200	2,435	
Highland	136,068	70,583	65,485		19,931	64,803			25,539			5,780	1,906				18,109
Hocking	530,041	363,020	167,021		10,200	18,968	18,544	29,729	31,764	24,341	17,509	11,062				278,920	89,004
Holmes	627,334	324,618	302,716	29,029	109,560	131,222	28,178	106,067	47,222	30,465	88,814	24,696	27,842			3,139	1,100
Knox	971,077	458,008	513,069		104,592	245,669	46,018	88,098	112,897		78,614		26,151			124,241	144,797
Licking	1,111,654	594,997	516,657	54,625	357,249	237,798	7,074	35,225	26,338		1,898					267,349	124,098
Logan	190,003	112,485	77,518	489	488	1,838	1,838					461	462			109,697	74,730
Lorain	3,378	1,689	1,689	1,689	1,689												
Lucas	3,000	1,500	1,500													1,500	1,500
Madison	10,792	1,966	8,826	1,966	8,826												
Mahoning	36,241	16,665	19,576	6,581	3,959					7,422			12,559		2,662		3,058
Marion	16,227	11,902	4,325	567		11,335	2,118						652				1,555
Medina	161,000	80,500	80,500													80,500	80,500
Meigs	1,255,929	934,735	321,194			586,078	125,421									348,657	195,773
Miami	403,756	237,872	165,884		50,000	38,514										199,358	115,884
Montgomery	751,905	348,850	403,055	36,297	119,511	48,250	54,500	21,000	6,750						20,000	223,303	222,294
Morrow	285,000	78,000	207,000	1,000		36,000		19,000								22,000	207,000
Muskingum	217,704	185,096	32,608	7,678	1,684			85,463	6,253	1,666	588					90,289	24,083

TABLE 13. ***2018 Ohio sand and gravel sales, by county and use (cont'd.)***

County	Tons sold															
	Total sand and gravel	Total sand	Total gravel	Building		Portland cement concrete		Asphaltic concrete		Road construction/ resurfacing		Filtration		Foundry sand	Industrial sand	Other/unspecified	
				Sand	Gravel	Sand	Gravel	Sand	Gravel	Sand	Gravel	Sand	Gravel			Sand	Gravel
Pickaway	917,613	476,226	441,387		309	339,000	105,000	80,000	50,000	10,580	10,161					46,646	275,917
Pike	342,197	282,230	59,967													282,230	59,967
Portage	3,178,025	2,207,295	970,730	226,090	234,319	770,163	113,621	391,293	257,528	135,221	126,461	1,440	57,865		13,700	669,388	180,936
Preble	347,329	158,940	188,389	49,461	76,700	20,429	69,350	8,461	1,476	65,081						15,508	40,863
Richland	392,500	265,227	127,273	44,051	56,745			65,604	38,476		427					155,572	31,625
Ross	283,794	160,963	122,831	4,473	27,376	14,822	80	33,990	32,485	1,848	6,338					105,830	56,552
Sandusky	259	130	129					130	129								
Scioto	24,400	11,312	13,088	100	2,093	237	20									10,975	10,975
Shelby	194,230	97,115	97,115													97,115	97,115
Stark	4,065,589	2,325,736	1,765,492	47,371	368,546	555,455	27,429	569,005	608,477	496,670	344,132					657,235	416,908
Summit	13,835	13,156	679	13,056	679											100	
Tuscarawas	1,524,171	997,090	527,081	279,784	202,292	131,106	48,253	343,167	110,426	123,277	164,692	28,000			62,638	29,118	1,418
Warren	657,862	284,989	372,873	237,957	297,345	4,334	14,810	12,584	26,659							30,114	34,059
Washington	768,696	524,225	244,471	29,350	7,962	258,086	15,925		47,782		14,059					236,789	158,743
Wayne	417,294	266,528	150,766	18,904	119,225	162,721	4,064	60,996	12,360	20,171	12,679	3,736	2,438				
Williams	305	153	152													153	152
Wood	8,715	4,357	4,358	4,357	4,358												
Wyandot	327,952	230,278	97,674	38,094	51,179	54,935	5,935	131,000				554	36,865			5,695	3,695
TOTAL[1]	31,435,724	17,950,165	13,485,559	2,342,248	4,051,607	5,405,949	1,318,777	2,246,392	1,553,691	1,070,719	1,352,118	76,229	167,090	1,409	103,315	6,703,904	5,042,276

[1]Any tally inconsistencies are because of rounding.

SANDSTONE AND CONGLOMERATE

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Extensive high-quality sandstone and conglomerate deposits are located in central and eastern Ohio, from near Lake Erie to the Ohio River. During the mid-1800s, these geologic resources were developed into large building-stone and glass production industries, and to support the steel and associated industries. Many prominent buildings in the state use local building stones, including the Ohio Statehouse, Cleveland's Old Stone Church, The Ohio State University's Orton Hall, Cincinnati's City Hall, and numerous other churches, monuments, and historic structures.

Ohio led the nation in sandstone production for many decades; this natural resource continues to support the state's industries today. Historically, the Pennsylvanian-age Massillon sandstone and the Devonian-age Berea Sandstone of northern Ohio, as well as the Mississippian-age Buena Vista Sandstone in southern Ohio, have been the primary geologic units quarried for building stone (Bownocker, 1915; see also fig. 7).

Production

- Tons produced = 1,243,043 (–28.0% from 2017)
- U.S. ranking
  - 5th out of 50 producing states for crushed stone (USGS, 2019a)
  - Detailed 2018 U.S. rankings for the 34 dimension-stone producing states were unavailable (USGS, 2019d); in 2017, Ohio ranked in the top 20
- Top Producing Geologic Units (fig. 7):
  - Sharon conglomerate (Pennsylvanian)
  - Berea Sandstone (Devonian)
  - Logan Formation (Mississippian)
  - Cuyahoga Formation (Mississippian)

Sales

(See figs. 12, 13)

- Tons sold = 1,169,811 (–28.5% from 2017; table 14, 15)
- Value[6] = $48,203,968 (table 9)
- Leading counties (percentage of statewide sales):
  - Geauga (64.6%)
  - Wayne (8.3%)
  - Lake (5.8%)
  - Pike (5.4%)
  - Knox (5.1%)

Employment

(See table 10)

- Production employees reported = 263
- Nonproduction employees reported = 115
- Average employee annual wage = $51,812
- Total wages earned = $16,935,892
- Average days worked per operation = 162

[6] Includes reported and estimated values. See footnote 1, p. 1.

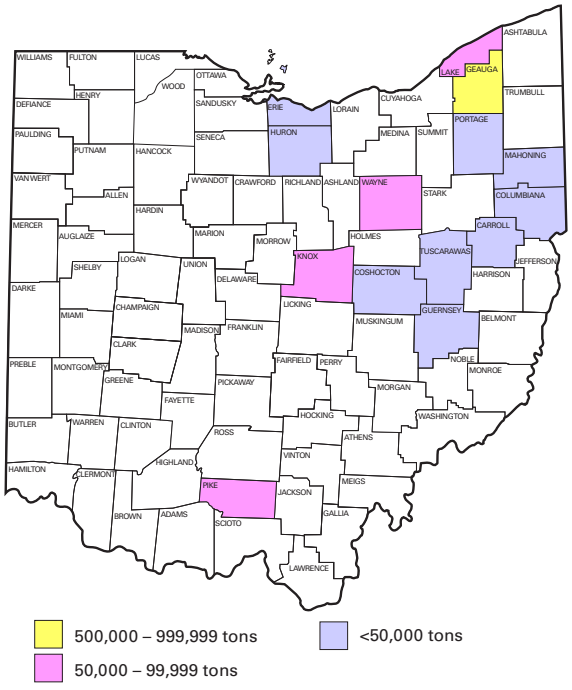

FIGURE 12. Sales of sandstone and conglomerate in Ohio in 2018, by county and quantity.

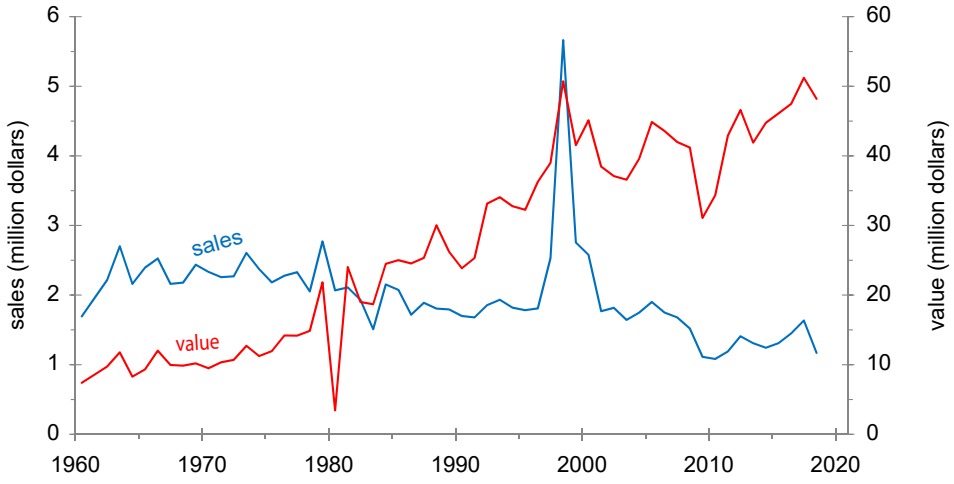

FIGURE 13. Sales and value of sandstone and conglomerate.

TABLE 14. *2018 Ohio sales of crushed sandstone and conglomerate, by county and use*

County	Tons sold														
	Total	Foundry sand	Glass sand	Metallurgical pebble	Refractory	Riprap	Aggregate	Silica flour	Polishing/ grinding sand	Fire and furnace sand	Engine sand	Frac sand	Construction	Industrial sand	Other/ unspecified
Carroll	2,656														2,656
Columbiana	21,255				8,465									4,053	8,737
Geauga	755,418	86,092	185,347	1,807	5,785		19,496					280	222,093	27,573	206,945
Guernsey	9,600					2,600									7,000
Knox	58,474	11,810	15,267								7,714	5,662	5,417	7,215	5,389
Lake	67,701						56,144						11,557		
Mahoning	42,573												42,573		
Pike	62,748												28,805		33,943
Portage	15,884														15,884
Tuscarawas	11,504					3,052							7,998		454
Wayne	95,144					9,339	82,447						3,358		
TOTAL	1,142,957	97,902	200,614	1,807	14,250	14,991	158,087				7,714	5,942	321,801	38,841	281,008

TABLE 15. *2018 Ohio sales of dimension sandstone, by county and use*

County	Tons sold									
	Total	Refractory	Rough construction	Rubble	Grindstones	Rough architectural	Finished	Curbing	Flagging	Other/ unspecified
Columbiana	177									177
Coshocton	5,960									5,960
Erie	8,078		3,626	94		1,731	2,617		10	
Guernsey	5,451		5,451							
Huron	2,701		2,701							
Knox	833		242				81			510
Lorain	1,406			1,275			131			
Scioto	582									582
Wayne	1,666									1,666
TOTAL	26,854		12,020	1,369		1,731	2,829		10	8,895

CLAY AND SHALE

Directory of operators available at: **http://geosurvey.ohiodnr.gov/economic-geology/economic-geology-home**

The ceramics industry in Ohio has a long and dynamic history. Potteries were established by the early 1800s to supply dinnerware, and by the early 1900s, Ohio was producing tremendous amounts of building bricks, sewer pipes, roof and floor tiles, paving bricks, art pottery, and refractory products. Edward Orton, Jr., established the first ceramics engineering program in the nation at Ohio State University in 1894. Ohio clay and shale still are being used to produce important ceramic products, though production tonnages are much less than 100 years ago. Ohio ceramic products are shipped throughout the eastern United States and Canada. Nearly all clay and shale produced in Ohio is used to produce value-added products (e.g., building bricks, industrial ceramics, pottery, expanded aggregate, quarry tile), thus the economic impact is much greater than the combined mined value.

Pennsylvanian-age shales and clays of eastern Ohio are the primary sources of raw materials for the ceramics industry; Mississippian and Devonian-age shales of northern and central Ohio and Pleistocene-age glacial clays of western Ohio are important secondary sources. General discussions of clay and shale geology in Ohio can be found in Lamborn and others (1938) and Stout and others (1923).

Production

- Tons produced (clay) = 742,357 (–18.7% from 2017)
- Tons produced (shale) = 443,552 (–34.3% from 2017)
- Detailed 2018 U.S. rankings for the 40 producing states were unavailable (USGS, 2019e); in 2016, Ohio was ranked 6th.

Sales

(See figs. 14, 15, 16, 17)

- Clay:
  - Tons sold = 667,978 (–13.7% from 2017; table 16)
  - Value[7] = $5,912,513 (table 9)
- Leading counties for clay (percentage of statewide sales):
  - Tuscarawas (28.0%)
  - Paulding (19.7%)
  - Defiance (8.2%)
  - Mahoning (6.6%)
  - Washington (6.1%)
- Shale:
  - Tons sold = 524,129 (–17.1% from 2017; table 17)
  - Value[8] = $11,506,384 (table 9)
- Leading counties for shale (percentage of statewide sales):
  - Tuscarawas (35.6%)
  - Cuyahoga (32.2%)
  - Harrison (5.4%)
  - Marion (5.2%)
  - Coshocton (4.8%)

Employment

(See also table 10)

- Production employees reported = 252
- Nonproduction employees reported = 172
- Average employee annual wage = $42,478
- Total wages earned = $15,653,457
- Average days worked per operation = 135

[7] Includes reported and estimated values. See footnote 1, p. 1
[8] Includes reported and estimated values. See footnote 1, p. 1

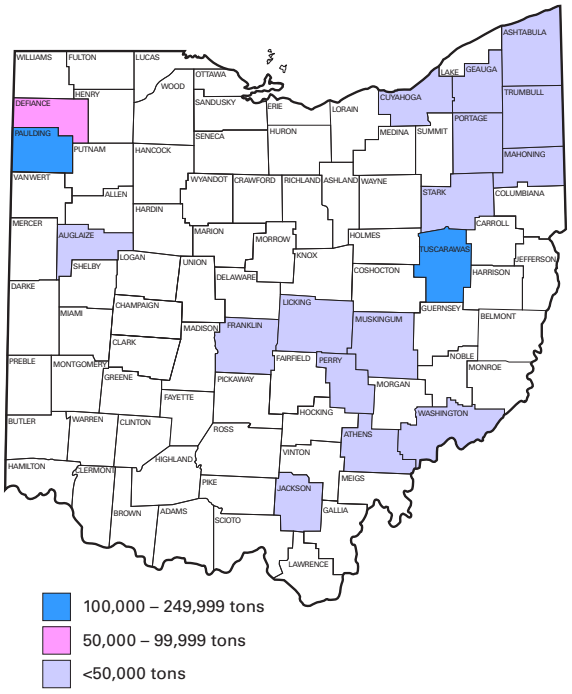

FIGURE 14. Clay sales in Ohio in 2018, by county and quantity.

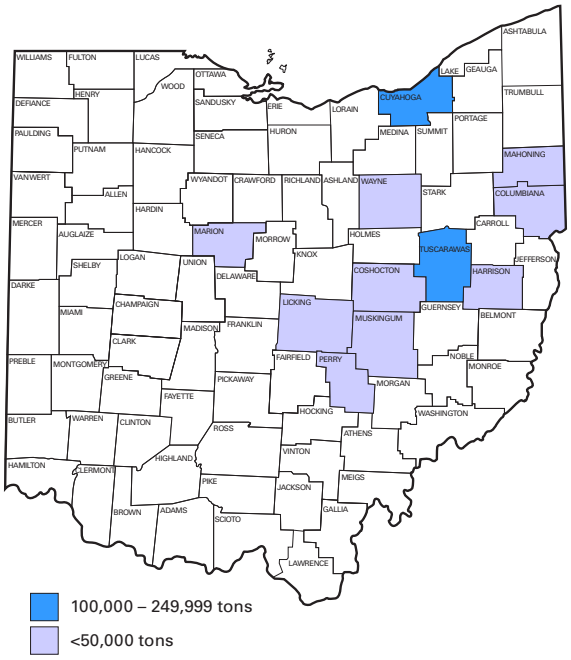

FIGURE 15. Shale sales in Ohio in 2018, by county and quantity.

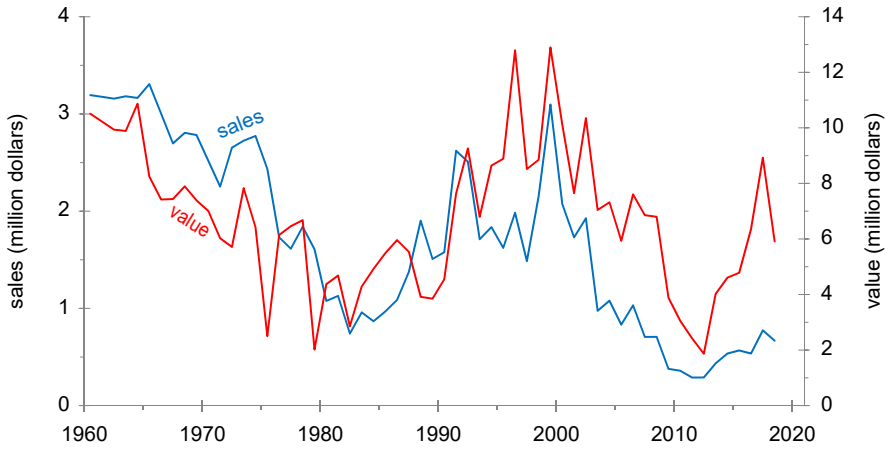

FIGURE 16. Sales and value of clay in Ohio.

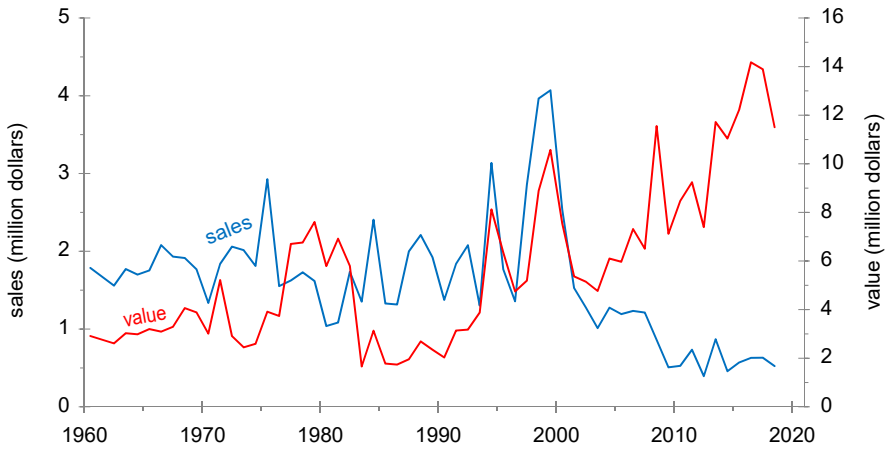

FIGURE 17. Sales and value of shale in Ohio.

TABLE 16. ***2018 Ohio clay sales, by county and use***

County	Tons sold								
	Total	Common clay products	Stoneware	Vitrified products	Cement manufacture	Refractories	Construction	Landfill use	Other/ unspecified
Ashtabula	3,452						3,452		
Athens	22,000							22,000	
Auglaize	1,798	1,798							
Cuyahoga	6,291	1,304							4,987
Defiance	55,000							55,000	
Franklin	10,920							10,920	
Geauga	8,860								8,860
Jackson	33,514					5,627			27,887
Licking	40,485						40,485		
Mahoning	43,789								43,789
Muskingum	26,825	11,825	1,000			7,000	7,000		
Paulding	131,624				131,624				
Perry	11,505	11,505							
Portage	7,078	68					7,000		10
Stark	2,920								2,920
Trumbull	33,923							33,923	
Tuscarawas	187,260	164,189			22,659				412
Washington	40,734						40,734		
TOTAL	667,978	190,689	1,000	0	154,283	12,627	98,671	121,843	88,865

TABLE 17. ***2018 Ohio shale sales, by county and use***

County	Tons sold							
	Total	Common clay products	Vitrified products	Cement manufacture	Lightweight aggregate	Construction	Landfill use	Other/ unspecified
Columbiana	9,795	9,795						
Coshocton	25,196						25,196	
Cuyahoga	168,597				168,597			
Harrison	28,202	28,202						
Knox	1,148							1,148
Licking	20,268	20,268						
Mahoning	17,517							17,517
Marion	27,242							27,242
Muskingum	10,000					10,000		
Perry	22,674	22,674						
Tuscarawas	186,363	186,363						
Wayne	7,127							7,127
TOTAL	524,129	267,302	0	0	168,597	10,000	25,196	53,034

SALT

Directory of operators available at: **http://geosurvey.ohiodnr.gov/economic-geology/economic-geology-home**

Salt was one of the first industrial minerals produced in Ohio and was a valuable commodity to early pioneers who obtained it from natural springs. The first State Legislature enacted laws concerning salt springs in 1803–1804, and wells were drilled in Jackson and Muskingum Counties, leading to the first commercial salt production in the state. The most important area for early salt production was in Meigs County, beginning in 1850. By 1903, Ohio was producing 14.7 percent of all salt in the United States (Bownocker, 1906).

The modern salt industry in Ohio began in 1956 with the construction of the underground salt mine at Fairport Harbor in Lake County. A second large underground operation was constructed in Cleveland, beginning in 1957. The primary use for Ohio salt in 2018 was ice control. Salt also was used as an additive in animal feed, for cattle blocks, and as a commercial and residential water-softening agent.

Salt production in 2018 decreased slightly from 2017, and sales decreased for the third straight year. Decreased sales are likely a result of the unusually warm winter with lower-than-average precipitation.

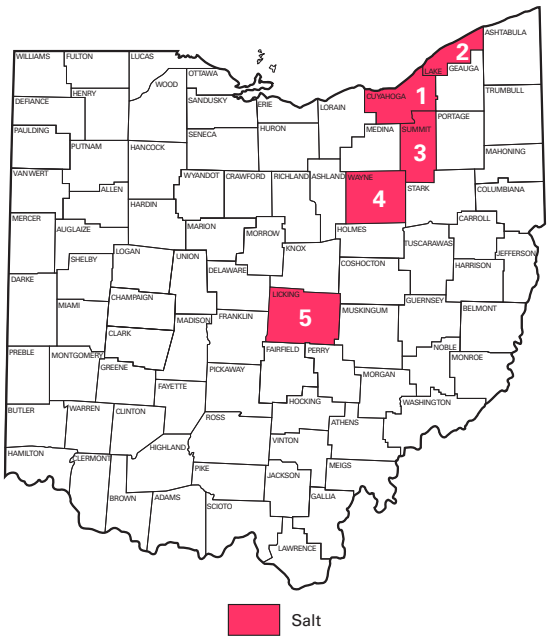

FIGURE 18. Counties producing salt in Ohio in 2018 and their rankings in sales.

Production

- Tons produced = 3,835,221 (–16.7% from 2017)
- U.S. ranking
  - 5th out of 16 producing states (USGS, 2019f)
- Top producing geologic units (fig. 7):
  - Salina Group (Silurian)

Sales

(See figs. 18, 19)

- Tons sold = 3,909,206 (–11.9% from 2017)
- Value[9] = $218,146,674 (table 9)

Employment

(See table 10)

- Production employees reported = 238
- Nonproduction employees reported = 184
- Average employee annual wage = $73,918
- Total wages earned = $31,045,473
- Average days worked per operation = 292

[9] Includes reported and estimated values. See footnote 1, p. 1.

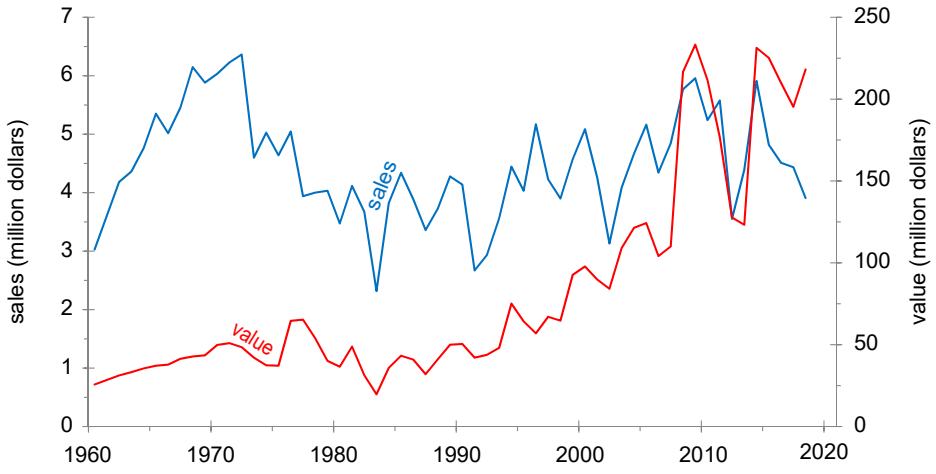

FIGURE 19. Sales and value of salt in Ohio.

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LIST OF DOWNLOADABLE APPENDICES

Mineral commodity summaries as well as the following appendices can be found on the Ohio Department of Natural Resources, Division of Geological Survey website at http://geosurvey.ohiodnr.gov/economic-geology/mineral-industry-summaries

2018 Coal companies reporting sales and/or production, by company and county
http://geosurvey.ohiodnr.gov/economic-geology/mineral-industry-summaries/post/2018-coal

2018 Limestone and dolomite companies reporting sales and/or production, by company and county
http://geosurvey.ohiodnr.gov/economic-geology/mineral-industry-summaries/post/2018-limestone-dolomite

2018 Sand and gravel companies reporting sales and/or production, by company and county
http://geosurvey.ohiodnr.gov/economic-geology/mineral-industry-summaries/post/2018-sand-gravel

2018 Sandstone and conglomerate companies reporting sales and/or production, by company and county
http://geosurvey.ohiodnr.gov/economic-geology/mineral-industry-summaries/post/2018-sandstone-conglomerate

2018 Clay and Shale companies reporting sales and/or production, by company and county
http://geosurvey.ohiodnr.gov/economic-geology/mineral-industry-summaries/post/2018-clay-shale

2018 Salt companies reporting sales and/or production, by company and county
http://geosurvey.ohiodnr.gov/economic-geology/mineral-industry-summaries/post/2018-salt

STATE OF OHIO
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL SURVEY
Michael P. Angle, Chief

Map IM-1 2018 Edition
11/2019

MAP OF ACTIVE MINERAL INDUSTRY OPERATIONS IN OHIO 2018

By
Christopher E. Wright

GIS Database Administration by Joseph G. Wells
GIS Cartography by Dean R. Martin

ABOUT THE MAP

This map is based on operators included in the supplementary appendices of the 2018 Report on Ohio Mineral Industries (Wright, 2019) and is intended for general reference. Locations of mineral extraction operations are approximate and are based on permitting information on file at the Ohio Department of Natural Resources (ODNR), Division of Mineral Resources Management. The letters and numbers adjacent to the symbols are the state mine numbers assigned to operations listed in the downloadable directories of the 2018 Report on Ohio Mineral industries. Operator and other information can be viewed by using the state mine number to refer to the table included on this map or to directories of operators reporting sales or production available online at **https://geosurvey.ohiodnr.gov/economic-geology/economic-geology-home.** An interactive mineral industries map also is available on the ODNR Division of Geological Survey website at OhioGeology.com.

2018 OHIO ECONOMIC GEOLOGY IN BRIEF

The total tonnage of coal and industrial minerals produced in Ohio during 2018 was 113,037,754 tons or approximately 9.7 tons per capita. The total value[1] of coal was $379,576,872 in 2018; the value of oil and gas was $8,374,209,575; and the value[1] of all nonfuel industrial minerals was $1,183,675,048 in 2018 (table 1; fig. 1). The combined value of fuel and nonfuel minerals produced in Ohio during 2018 was $9,937,461,495 or approximately $850 per capita.

Reported and estimated total direct employment in the extractive industries of Ohio in 2018 was more than 10,000 people. Industrial-mineral production decreased for all commodities except limestone and dolomite. The total value of nonfuel industrial minerals exceeded $1 billion for the fifth straight year. In 2018, production for the leading commodity of limestone and dolomite was up 4.7%, while the second leading commodity of sand and gravel was down 2.1%, and the third leading commodity of coal was down 6.4% from 2017 values. In 2018, clay, shale, salt, and sandstone and conglomerate commodities production were all down by double digit percentages.

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Wright, C.E., compiler, 2019, 2018 Report on Ohio mineral industries–An annual summary of the state's economic geology: Columbus, Ohio Department of Natural Resources, Division of Geological Survey, 23 p.

[1]Includes reported and estimated values. Some operations reporting sales did not report a value for those sales. A countywide- or statewide-average price per ton was calculated for each industrial-mineral commodity based on sales for which the value was reported. A countywide-average price per ton was calculated for coal based on sales for which the value was reported and method of production. These calculated averages were used to estimate the value of the sales for which the actual values were not reported.

TABLE 1. *Fuel and nonfuel mineral sales and production in Ohio in 2018*

Commodity	Production[1]	Sales[2]	Value[3]	Change in value from 2017 (percent)
Limestone and dolomite	65,458,961 tons	64,821,047 tons	$654,299,122	+ 6.6
Coal	9,613,912 tons	9,882,346 tons	$379,576,872	− 0.8
Sand and gravel	31,700,708 tons	31,435,724 tons	$245,606,387	+ 1.4
Salt	3,835,221 tons	3,909,206 tons	$218,146,674	+ 11.7
Sandstone and conglomerate	1,243,043 tons	1,169,811 tons	$48,203,968	− 5.9
Shale	443,552 tons	524,129 tons	$11,506,384	− 17.2
Clay	742,357 tons	667,978 tons	$5,912,513	− 33.7
Gas	2,398,386,763 thousand cubic feet	not available	$7,003,289,348	+ 41.2
Oil	22,795,481 barrels	not available	$1,370,920,227	+44.4

[1] The production figures for industrial minerals are estimates, as many operators do not know actual production. For those operators that do not report production, production is assumed equal to sales or estimated from ODNR Division of Mineral Resources Management records.
[2] Includes material for captive use.
[3] The FOB value of industrial minerals sold was estimated for mines that failed to report this information and for those producing material for captive use. These estimates were calculated using a countywide- or statewide-average price per ton calculated using reported FOB values.

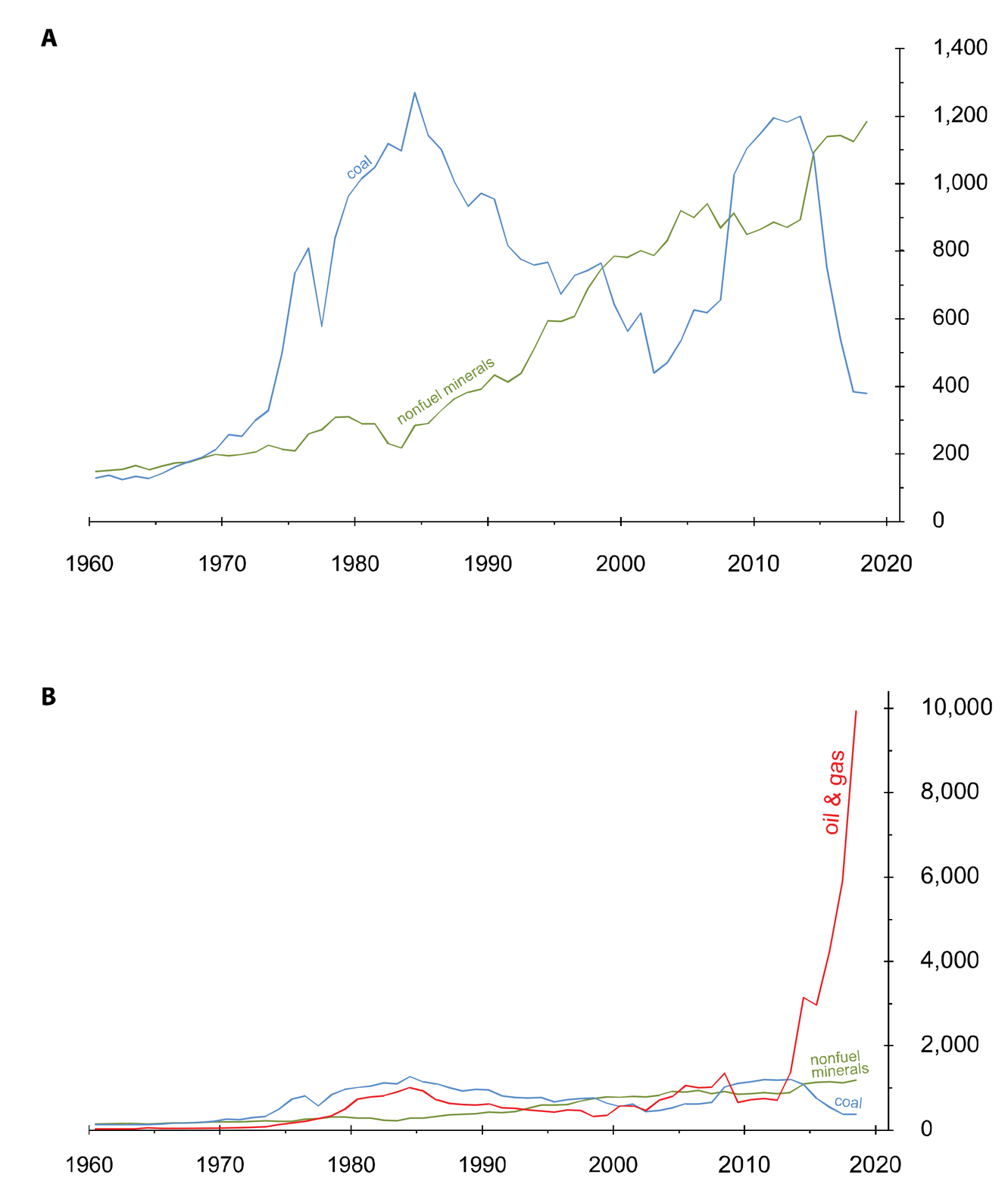
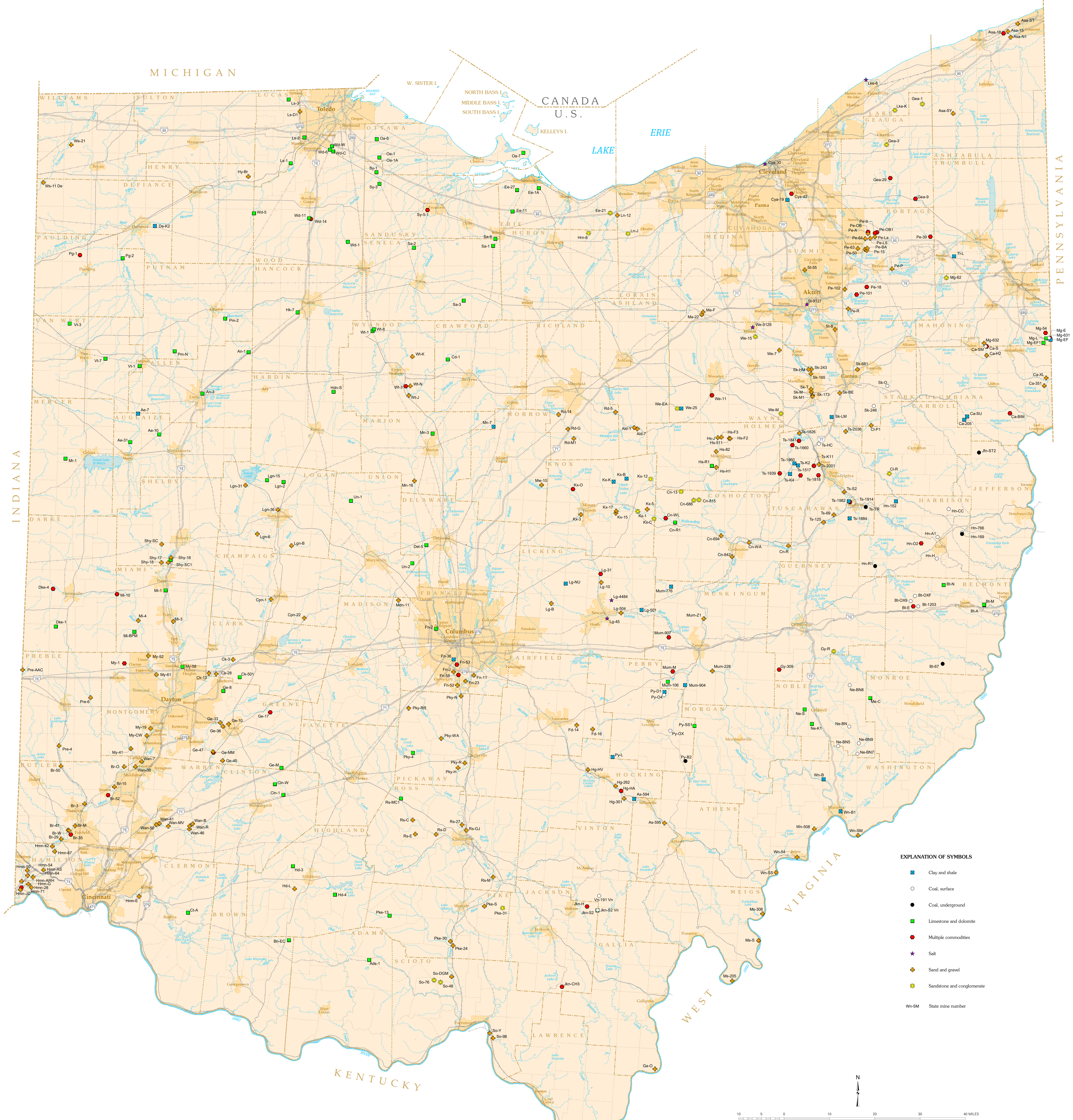


FIGURE 1. (A) Value of coal and nonfuel minerals in Ohio since 1960. (B) Value of coal, nonfuel minerals, and oil and gas in Ohio since 1960.



REPORTING COAL AND INDUSTRIAL MINERAL OPERATORS, BY COUNTY

STATE MINE NUMBER	COMPANY NAME	MINE NAME	TOTAL PRODUCTION (TONS)	TOTAL SALES (TONS)
Adams County				
Ads-1	Hanson Aggregates Davon LLC	Plum Run Quarry	974,639	886,188
Allen County				
An-1	Bluffton Stone Co.	Bluffton Stone Co.	323,237	315,710
An-3	National Lime & Stone Co.	Lima Plant	467,000	467,000
Ashland County				
Ald-7	Young's Sand & Gravel Co.	Sprang & Youngs	1,429	4,312
Ald-Y	Young's Sand & Gravel Co.	Spreng	239,359	239,359
Ashtabula County				
Asa-15	R. W. Sidley, Inc.	Sidley-Kingsville Plant	10,163	12,565
Asa-18	Joe Simak & Sons Trucking, Inc.	North Ridge Pit	57,666	57,666
Asa-N1	Nelson Sand & Gravel, Inc.	Nelson Sand & Gravel, Inc.	41,200	41,200
Asa-ST	Joe Simak & Sons Trucking, Inc.	Amboy Pit	22,830	25,330
Asa-SY	Sypniewski, Joseph N.	Sypniewski	26	26
Athens County				
As-594	Athens Hocking Reclamation Center	Athens-Hocking Clay Mine	22,000	22,000
As-595	Cochran Transportation Services, Inc.	Circle Hill	55,563	16,076
Auglaize County				
Ae-10	National Lime & Stone Co.	Buckland Plant	245,000	245,000
Ae-31	Con-Ag, Inc.	Con-Ag, Inc.	440,911	443,504
Ae-7	Sandkuhl Clay Works, Inc.	Sandkuhl Clay Works, Inc.	1,798	1,798
Belmont County				
Bt-1203	Oxford Mining Co., LLC	Shugert North	100,477	94,934
Bt-67	American Energy Corp.	Century Mine	4,785,568	5,508,178
Bt-A	Sidwell Materials, Inc.	Blaine Aggregates	476,157	410,600
Bt-E	Egypt Valley Stone, LLC	Shugert	736,477	736,477
Bt-M	Maysville Materials, LLC	Maysville Materials, LLC	38,316	0
Bt-N	Sidwell Materials, Inc.	Uniontown Stone	451,091	357,449
Bt-OX9	Oxford Mining Co., LLC	Buttermilk	619	1,830
Bt-OXF	Oxford Mining Co., LLC	Egypt Valley Wildlife	358,012	373,464
Brown County				
Bn-EC	Hanson Aggregates Davon LLC	Eagle Crushed Stone	1,592,078	1,566,094
Butler County				
Br-15	Watson Gravel, Inc.	Mecco, Inc.	576,357	576,357
Br-29	Martin Marietta Aggregates	Ross Sand & Gravel	8,640	8,640
Br-3	The Gravel Company	New Miami Pit	426	426
Br-35	Martin Marietta Aggregates	Fairfield Sand & Gravel	857,545	1,046,226
Br-47	Watson Gravel, Inc.	Watson Pit	1,081,051	1,081,051
Br-50	Dingledine Basic Materials, Inc.	Dingledine Basic Materials, Inc.	37,738	37,738
Br-52	Martin Marietta Aggregates	Trenton	519,241	377,221
Br-M	Miami Valley Topsoil, LLC	Miami Valley Topsoil, LLC	31,825	31,825
Br-O	Watson Gravel, Inc.	Ongais Plant #1	207,993	207,993
Br-W	Welch Sand & Gravel, Inc.	Hamilton City Plant	36,345	36,345
Carroll County				
Cl-R	Romig Excavating	Romig Excavating	2,656	2,656
Champaign County				
Cpn-1	Morrow Gravel Co.	Urbana	154,999	154,999
Cpn-22	Mechanicsburg Sand & Gravel, Inc.	Mechanicsburg Sand & Gravel, Inc.	119,135	119,135
Clark County				
Ck-13	Martin Marietta Aggregates	Fairborn Gravel	0	691
Ck-28	Barrett Paving Materials, Inc.	Haddix Sand & Gravel #399	463,000	495,000
Ck-3	Enon Sand & Gravel, LLC	Enon Sand & Gravel, LLC	456,917	456,917
Ck-501	Enon Sand & Gravel, LLC	Enon Sand and Gravel	44	44
Clermont County				
Ct-A	Arch Materials, LLC	Batavia Mine	1,975,000	1,893,350
Clinton County				
Cln-1	The Melvin Stone Co., LLC	The Melvin Stone Co., LLC	1,668,575	1,668,575
Cln-W	Shamrock Materials, Inc.	Clinton Limestone	4,722	4,722
Columbiana County				
Ca-205	Summitville Tiles, Inc.	Summitville Tiles, Inc.	1,860	1,860
Ca-351	Buck Run Aggregates, LLC	Krcich	34,007	34,007
Ca-BIM	Rosebud Mining Company	Peters Run	9,990	9,990
Ca-H2	Harvest Sand & Gravel, Inc.	Eberly	11,642	11,642
Ca-S	Solomon's Mines, Inc.	Solomon's Mines, Inc.	18,054	18,054
Ca-SM	Solomon's Mines, Inc.	Solomon's Mines, Inc.	187	187
Ca-SU	Summitville Tiles, Inc.	Summitcrest, Inc.	7,935	7,935
Ca-XL	X. L. Sand & Gravel Co., Inc.	X. L. Sand & Gravel Co., Inc.	24,860	24,860
Coshocton County				
Cn-13	Briar Hill Stone Co.	Quarry #26	333	333
Cn-686	Briar Hill Stone Co.	Quarry #32	590	590
Cn-694	Shelly Materials, Inc.	Shelly Materials, Inc., Plant #1305	89,261	325,474
Cn-815	Briar Hill Stone Co.	Quarry #55	5,037	5,037
Cn-842	Coshocton Trucking Inc.	Woodie Land - Duck Hole	1,735	510
Cn-R	Razor Lake Materials Inc.	Razor Lake S. & G., LLC	49,875	41,875
Cn-R1	Rohr Excavating, Ltd.	Miller	20,001	20,001
Cn-WA	William Albert, Inc.	William Albert, Inc., Pit 2	12,565	11,864
Cn-WL	Walhonding Sand & Gravel	Walhonding Valley Sand & Gravel	54,594	64,594
Crawford County				
Cd-1	National Lime & Stone Co.	Bucyrus Plant	971,000	971,000
Cuyahoga County				
Cya-19	DiGeronimo Aggregates, LLC	DiGeronimo Aggregates, LLC	125,262	168,597
Cya-30	Cargill, Incorporated	Cargill Deicing Technology	1,810,235	1,525,310
Cya-42	Boyas Excavating, Inc.	Boyas Excavating, Inc.	34,778	34,778
Darke County				
Dke-1	Shamrock Materials, Inc.	Walls Material	337,132	337,132
Dke-4	Foureman's Sand & Gravel, Inc.	Foureman's Sand & Gravel, Inc.	30,872	30,872
Defiance County				
De-K2	Kev Properties, LLC	Kev Properties	55,000	55,000
Ws-11 De	Weber Sand & Gravel, Inc.	Weber Sand & Gravel, Inc.	193,572	193,572
Delaware County				
Del-5	National Lime & Stone Co.	Delaware Plant	2,956,000	2,956,000
Erie County				
Ee-11	Hanson Aggregates Midwest, Inc.	Sandusky Crushed Stone	2,855,326	2,756,808
EE-1A	Hanson Aggregates Midwest, Inc.	Wagner Quarry	1,370,732	1,442,211
Ee-21	IRG Operating, LLC, dba Cleveland Quarries	IRG Operating, LLC	22,937	8,078
Ee-27	Erie Blacktop, Inc.	Erie Blacktop Quarry	378,499	378,499
Fairfield County				
Fd-14	Paul D. Beery Trucking Co.	Paul D. Beery Trucking Co.	2,265	1,635
Fd-16	Digg Enterprises, LLC	Downard Pit	1,603	1,603
Franklin County				
Fn-11	Mason's Sand & Gravel Co.	Mason's Sand & Gravel Co.	24,222	24,222
Fn-2	Shelly Materials, Inc.	Marble Cliff Plant #0332	939,422	879,995
Fn-23	Shelly Materials, Inc.	Shelly Materials, Inc. - Lockbourne #1344	91,464	78,056
Fn-36	Agg Rok Materials	Agg Rok	10,920	10,920
Fn-52	National Lime & Stone Co.	Columbus	387	387
Fn-53	Shelly Materials, Inc.	Columbus Limestone #331	4,680,148	4,386,535
Fn-58	Olen Corp.	Columbus - Plant #3 (S&G)	4,305,275	3,854,924
Fn-J	National Lime & Stone Co.	Jackson	5,000	5,000
Gallia County				
Ga-O	Ours Sand & Gravel	Ours Sand & Gravel	2,010	2,010
Geauga County				
Gea-1	R. W. Sidley, Inc.	Thompson Pit	127,270	114,050
Gea-29	The Arms Trucking Company	Arms Sand & Gravel	85,715	85,715
Gea-3	Best Sand Corp.	Best Sand Corp.	619,920	641,368
Gea-9	Soltis Sand & Gravel	Soltis Sand & Gravel	4,551	4,551
Greene County				
Ge-10	Xenia Sand & Gravel, Inc.	Xenia Sand & Gravel, Inc.	460	460
Ge-17	Martin Marietta Aggregates	Cedarville	531,493	552,284
Ge-33	Martin Marietta Aggregates	Xenia S & G	314,005	250,025
Ge-36	Phillips Companies, LLC	Phillips Companies, LLC	216,950	206,110
Ge-40	R. J. Martin Service & Excavating	Horseshoe Bend Sand & Gravel, Inc.	101	101
Ge-47	M. J. Coates Construction Co., Inc.	M. J. Coates Construction Co., Inc.	125,043	125,043
Ge-8	Fairborn Cement Co., LLC	Miller, Schieder, Batdorf, Stewart	787,570	787,570
Ge-M	The Melvin Stone Co., LLC	Bowersville	4,264	4,264
Ge-MM	Martin Marietta Aggregates	Cook Rd.	380,615	360,902
Guernsey County				
Gy-309	Cumberland Limestone, LLC	Cumberland Limestone, LLC	122,537	305,962
Gy-R	Rocky Enterprise	Rocky Enterprise - Robins Ridge	9,600	9,600
Hamilton County				
Hmn-28	The Gravel Company	Cleves	380	380
Hmn-42	Welch Sand & Gravel, Inc.	Fernald Pit	616,783	616,783
Hmn-50	Hanson Aggregates Davon LLC	Dry Fork Sand & Gravel	487,879	476,735
Hmn-54	Ashcraft Sand & Gravel, Inc.	Ashcraft Sand & Gravel, Inc.	109,667	109,667
Hmn-64	Watson Gravel, Inc.	Minges-Getz	413,691	413,691
Hmn-67	R. L., Ltd.	R. L., Ltd.	600	600
Hmn-71	Martin Marietta Aggregates	E-town Sand & Gravel	232,200	343,418
Hmn-ARH	Watson Gravel, Inc.	Harrison #2	753,824	753,824
Hmn-AS	Allgeier & Son, Inc.	Allgeier & Son, Inc., Pit 2	60,000	60,000
Hmn-E	Evans Gravel, Inc.	Evans Gravel, Inc.	108,816	77,911
Hmn-G	Top Dog Service Company	Whitewater Reclamation Company	680	680
Hmn-JC	Carter, Joe E.	Lost Bridge	500	500
Hancock County				
Hk-7	National Lime & Stone Co.	Findlay Plant	925,000	925,000
Hardin County				
Hdn-S	Shelly Materials, Inc.	Forest Quarry	139,519	193,131
Harrison County				
Hn-152	Bowerston Shale Co.	Bowerston (Calwell)	28,202	28,202
Hn-169	Hopedale Mining, LLC	Hopedale Mining, LLC	409,560	423,630
Hn-766	Oxford Mining Co., LLC	Harrah	11,692	27,439
Hn-A1	Oxford Mining Co., LLC	Sandy Ridge	453,787	464,840
Hn-CC	Sidwell Materials, Inc.	Apex Quarry	2,398	2,398
Hn-H	Oxford Mining Co., LLC	Sexton 2 (Harrison)	589,599	608,101
Hn-O2	Oxford Mining Co., LLC	Standingstone Mine (Daron)	491,199	495,360
Hn-R1	Rosebud Mining Company	Vail Mine	262,732	262,732
Henry County				
Hy-Br	Burdette H Rathge and Sons LTD	Burdette H Rathge & Sons	3,135	4,135
Highland County				
Hd-3	Ohio Asphaltic Limestone Corp.	Ohio Asphaltic Limestone Corp.	417,064	417,064
Hd-4	Marshall Quarry, Inc.	Marshall Quarry, Inc.	9,500	21,600
Hd-L	Ervin Hill Enterprises, Inc.	Ervin Hill Enterprises, Inc.	136,068	136,068
Hocking County				
Hg-262	Hocking Valley Concrete, Inc.	Hocking Valley Concrete, Inc.	124,000	109,396
Hg-301	Muskingum River Gravel Co.	S & S Aggregate #8	29,729	29,729
Hg-HA	KCI Sand & Gravel	KCI Sand & Gravel	474,114	105,001
Hg-HV	MAR-ZANE Materials, Inc.	Enterprise Pit	264,396	297,909
Holmes County				
Hs-511	Feikert Sand & Gravel, Inc.	Feikert Sand & Gravel, Inc.	215,663	215,663
Hs-82	Holmes Redimix, Inc.	Holmes Redimix, Inc.	4,239	4,239
Hs-F2	Feikert Sand & Gravel, Inc.	Feikert Sand & Gravel	200	200
Hs-F3	Feikert Sand & Gravel, Inc.	Feikert Sand & Gravel	16,001	16,001
Hs-H1	Holmes Supply Corp.	Schlabach	302,501	302,501
Hs-J	Holmes Supply Corp.	Holmes Supply Corp.	88,730	88,730
Hs-R1	Rohr Excavating, Ltd.	Rohr	7,768	7,768
Huron County				
Hrn-8	Mesenburg Bros., Inc.	Mesenburg Bros., Inc.	2,701	2,701
Jackson County				
Jkn-CH3	Cedar Heights Clay Co.	Phillips	32,394	29,118
Jkn-H	HarbisonWalker International Inc.	Canter	29,032	21,232
Jkn-S2	Sands Hill Mining, LLC	Clinton Stone, LLC	282,740	311,857
Jefferson County				
Jfn-ST2	Sterling Mining Co.	SMC-Shean Hill	8,685	8,685
Knox County				
Kx-1	Pioneer Sands LLC	Millwood Plant	70,671	58,474
Kx-12	Briar Hill Stone Co.	Quarry #6	510	510
Kx-15	Small's Sand & Gravel, Inc.	Small's Sand & Gravel, Inc.	267,218	267,218
Kx-17	Small's Sand & Gravel, Inc.	Small's Sand & Gravel, Inc.	324	324
Kx-3	United Aggregates, Inc.	United Aggregates, Inc.	268,227	157,061
Kx-5	United Aggregates, Inc.	United Aggregates, Inc.	18,910	16,541
Kx-B	Buckland, Edsel L.	Buckland	200	200
Kx-C	IRG Newcastle, LLC	Fletcher	654	323
Kx-K	Knox County Board of Commissioners	Apple Valley	948	948
Kx-O	Olen Corp.	Fredericktown - Plant #2	477,190	540,102
Lake County				
Lke-6	Morton International, Inc.	Fairport Mine	1,262,630	1,312,838
Lke-K	Keeney Sand & Stone, Inc.	Keeney Sand & Stone, Inc.	67,701	67,701
Licking County				
Lg-10	Shelly Materials, Inc.	St. Louisville	269,830	344,182
Lg-31	Olen Corp.	St. Louisville - Plant #5	451,136	549,867
Lg-4484	Royalty Enterprises, Inc.	King #1	290	290
Lg-45	R. H. Penick Co., Ltd.	R. H. Penick Co.	360	360
Lg-501	Bowerston Shale Co.	Hanover Pit	20,268	20,268
Lg-504	Newark Materials, LLC	Newark Materials	36,930	36,930
Lg-B	Brookside Materials, LLC	Brookside Materials, LLC	225,000	183,285
Lg-NU	Nuway Services	Hopewell	40,485	40,485
Logan County				
Lgn-15	Duff Quarry, Inc.	Duff Quarry, Inc.	569,039	569,039
Lgn-2	Shelly Materials, Inc.	Belle Center	185,922	254,374
Lgn-31	Duff Quarry, Inc.	Duff Sand Co.	4,653	4,653
Lgn-36	Duff Quarry, Inc.	Duff Quarry, Inc.	923	923
Lgn-6	Neer's Sand & Gravel	Neer's Sand & Gravel	175,148	175,148
Lgn-B	Boyd Excavating	Boyd Excavating	9,279	9,279
Lorain County				
Ln-12	Schieve, Guy	Schieve Pit	3,378	3,378
Ln-J	Johnson Stone Products, Inc.	Johnson Stone Products	1,406	1,406
Lucas County				
Ls-1	Hanson Aggregates Midwest, Inc.	Waterville	406,277	365,228
Ls-2	Stoneco, Inc.	Maumee Quarry	720,988	808,184
Ls-3	Hanson Aggregates Midwest, Inc.	Sylvania	825,635	820,424
Ls-D1	Dennis Topsoil & Landscaping, Inc.	Dennis Topsoil & Landscaping, Inc.	3,000	3,000
Madison County				
Mdn-11	Tuffco Sand & Gravel, Inc.	Tuffco Sand & Gravel, Inc.	10,792	10,792
Mahoning County				
Mg-54	East Fairfield Coal Co.	Honey Creek Stone Co.	449,707	471,713
Mg-62	City Stone, LLC	City Stone, LLC	42,573	42,573
Mg-631	East Fairfield Coal Co.	Withers-Petersburg	15,876	79,646
Mg-632	Solomon's Mines, Inc.	Solomon's Mines, Inc.	36,241	36,241
Mg-E	East Fairfield Coal Co.	Withers-Petersburg	2,240	2,240
Mg-EF	East Fairfield Coal Co.	Withers Petersburg - Surface	37,637	37,637
Mg-EF1	Subtropolis Mining	Kemp Mine	1,141,098	1,183,263
Mg-L	Shelly Materials, Inc.	Petersburg	464,550	645,348
Marion County				
Mn-16	Fleming Construction Co., Inc.	Pit #1	16,227	16,227
Mn-3	National Lime & Stone Co.	Marion Plant	439,000	439,000
Mn-7	Glen-Gery Corp.	Iberia Quarry	0	27,242
Medina County				
Ma-22	Friendsville Sand, LP	Friendsville	112,000	112,000
Ma-F	Friendsville Sand, LP	Friendsville Sand	49,000	49,000
Meigs County				
Ms-205	Martin Marietta Aggregates	Apple Grove Plant	330,256	323,176
Ms-308	Jaymar, Inc.	Plant #4	711,499	711,499
Ms-S	Shelly Materials, Inc.	Portland Plant	319,006	221,254
Mercer County				
Mr-1	Stoneco, Inc.	Celina Quarry	671,167	702,294
Miami County				
Mi-1	Piqua Materials, Inc.	Piqua Minerals Division	574,294	574,294
Mi-10	C. F. Poeppelman, Inc.	C. F. Poeppelman, Inc.	429,146	390,409
Mi-3	Martin Marietta Aggregates	Troy Sand & Gravel	263,454	307,968
Mi-4	Milton Materials, LLC	Milton Materials Fenner Pit	93,300	88,300
Mi-BPM	Barrett Paving Materials, Inc.	Ludlow Quarry #394	331,000	346,000
Monroe County				
Me-C	Christman Quarries	Christman Quarry	48,339	48,339
Montgomery County				
My-1	Martin Marietta Aggregates	Phillipsburg	584,979	515,062
My-19	Barrett Paving Materials, Inc.	West Carrollton Aggregate Plant	418,000	413,000
My-41	Eagle Materials, LLC	Plant #5	78,085	114,558
My-52	Phillips Companies, LLC	Phillips Sand and Gravel	216,400	191,750
My-58	Fairborn Cement Co., LLC	G-Tract	365,336	392,336
My-61	Tipp Stone Co., Inc.	Tipp Stone Co., Inc.	5,052	5,052
My-CW	Carter & Carter, Inc.	Carter & Carter, Inc.	300	300
Morrow County				
Mw-10	National Lime & Stone Co.	Chesterville Plant	285,000	285,000
Muskingum County				
Mum-106	Shelly Materials, Inc.	East Fultonham	902,945	975,964
Mum-228	Muskingum River Gravel Co.	S & S Aggregate #1	208,255	208,342
Mum-776	Bowerston Shale Co.	Frazeysburg	6,624	6,624
Mum-904	Valley Clay Mining Co.	Spring Pit	30,000	30,000
Mum-907	Thompson Mining Co.	Pleasant Valley Limestone	134,934	134,934
Mum-M	Maysville Materials, LLC	Maysville Materials, LLC	139,434	0
Mum-Z1	Zanesville Materials, LLC	Zanesville Materials	9,362	9,362
Noble County				
Ne-BN	B & N Coal, Inc.	Estadt Mine	44,389	44,389
Ne-BN5	B & N Coal, Inc.	Westfork Mine	96,573	96,573
Ne-BN8	B & N Coal, Inc.	Whigville V	144,955	144,955
Ne-BN9	B & N Coal, Inc.	Harrietsville	50,522	50,522
Ne-K1	King Quarries, Inc.	King Quarries, Inc.	149,433	149,433
Ne-S	Sharon Stone Co.	Sharon Stone Co.	122,848	122,848
Ottawa County				
Oa-1	Graymont Dolime (OH), Inc.	Graymont Dolime (OH), Inc.	237,267	581,366
Oa-1A	Genoa Limestone, LLC	Genoa Limestone	425,000	400,000
Oa-6	Stoneco, Inc.	White Rock Quarry	1,401,928	1,268,506
Oa-7	Lafarge Marblehead	Lafarge Marblehead	3,083,416	2,374,225
Paulding County				
Pg-1	Lafarge Corp.	Paulding Quarry	688,589	688,589
Pg-2	Stoneco, Inc.	Auglaize Quarry	546,466	609,450
Perry County				
Py-B2	Buckingham Coal Company, LLC	Buckingham Mine No. 6	1,393,103	900,121
Py-D1	TOM, LLC	Saltillo	20,913	20,913
Py-L	The Logan Clay Products Co.	Webb Summit	13,266	13,266
Py-O4	Oxford Mining Co., LLC	Avondale	89,963	99,049
Py-Ox	Oxford Mining Co., LLC	Cannon	80,494	81,082
Py-SS1	Sergeant Stone, Inc.	Sergeant Stone	208,277	203,208
Pickaway County				
Pky-4	The Melvin Stone Co., LLC	Williamsport	207,744	207,744
Pky-H	Hoffman, William A., Jr.	Hoffman Pit	204	204
Pky-N	National Lime & Stone Co.	National Lime & Stone	615,000	615,000
Pky-R	The Melvin Stone Co., LLC	Circleville	272,200	272,200
Pky-RR	Roush, Roy M.	R Farm S & G	1,050	1,050
Pky-WA	Westfall Aggregate & Materials, Inc.	Hill Road Pit	29,159	29,159
Pike County				
Pke-13	Latham Limestone, LLC	Latham Limestone	1,054,314	1,054,314
Pke-24	Hanson Aggregates Davon LLC	Piketon Sand & Gravel	158,248	159,269
Pke-30	South Central Sand & Gravel	South Central Sand & Gravel	67,950	67,950
Pke-31	Best Sand Corp.	Best-Southern Division	116,821	62,748
Pke-S	Southern Ohio Sand, LLC	Southern Ohio Sand, LLC	114,978	114,978
Portage County				
Pe-101	D & K Materials, Inc.	D & K Materials, Inc.	164,029	164,029
Pe-102	Core Aggregates LLC	Gans, Ltd., dba Brimfield Sand & Soils	40,000	23,000
Pe-15	S & S Aggregate, Inc.	S & S Aggregate #16	352,528	347,356
Pe-18	Sober Sand & Gravel Co.	Sober Sand & Gravel Co.	151,700	151,700
Pe-39	Miller's Sand & Gravel, Inc.	Miller Sand & Gravel, Inc.	1,780	1,780
Pe-50	Beck Sand & Gravel, Inc.	Beck Sand & Gravel, Inc.	292,303	292,303
Pe-63	Shelly Materials, Inc.	Jefferson Materials	462,326	436,700
Pe-64	Aurora Aggregate Supplies	Aurora Aggregate Supplies	46,200	46,200
Pe-9	Oscar Brugmann Sand & Gravel, Inc.	Oscar Brugmann Sand & Gravel, Inc.	431,127	431,127
Pe-A	Lakeside Sand & Gravel Co.	Solak	17,820	17,820
Pe-BA	Ballentine Sand & Gravel, LLC	Ballentine Lake	153,153	153,153
Pe-La	Shelly Materials, Inc.	Shalersville North	228,106	267,037
Pe-LS	Lakeside Sand & Gravel Co.	Lakeside Sand & Gravel Co. Plant 1	733,137	733,137
Pe-OB	Oscar Brugmann Sand & Gravel, Inc.	Oscar Brugmann Sand & Gravel, Inc.	80,837	80,837
Pe-OB1	Oscar Brugmann Sand & Gravel, Inc.	Oscar Brugmann Sand & Gravel, Inc.	26,946	26,946
Pe-P	Patrick Excavating, Inc.	Patrick	816	816
Pe-R	Rockwell Sand & Gravel, Inc.	Suffield Aggregate, LLC	27,696	27,696
Preble County				
Pre-4	Wysong Gravel Co.	Wysong Gravel Co.	99,511	99,756
Pre-6	Wysong Gravel Co.	Wysong Gravel Co. - West Alexandria Plant	55,645	56,101
Pre-AAC	U.S. Aggregates, Inc.	U.S. Aggregates - Richmond Plant	180,563	191,472
Putnam County				
Pm-2	National Lime & Stone Co.	Riley Creek	188,000	188,000
Pm-N	National Lime & Stone Co.	Rimer Plant	293,000	293,000
Richland County				
Rd-14	John L. Garber Materials, Inc.	John L. Garber Materials, Inc.	0	95,356
Rd-5	S & S Aggregate, Inc.	S & S Aggregate #14	264,318	291,704
Rd-G	John L. Garber Materials, Inc.	John L. Garber Materials, Inc.	95,356	0
Rd-M1	Mid Ohio Resources	Bellville West	0	5,440
Ross County				
Rs-27	Shelly Materials, Inc.	Shelly Materials, Inc. - Chillicothe	45,669	74,290
Rs-C	Calvin's Hauling, Inc.	Calvin's Hauling, Inc.	3,335	3,335
Rs-D	D.G.M., Inc.	Tow Path Warwick	40,732	40,732
Rs-E	Edgington, David E.	Edgington Pit	4,352	4,352
Rs-GJ	G & J Asphalt & Material Inc.	G & J Asphalt & Materials	50,463	50,463
Rs-M	Muskingum River Gravel Co.	S & S Aggregate Plant #7	104,420	110,622
Rs-MC1	The Melvin Stone Co., LLC	Plano Road	260,125	260,125
Sandusky County				
Sy-1	Martin Marietta Magnesia Specialties, LLC	Woodville Quarry	2,066,760	2,138,956
Sy-3	Carmeuse Lime, Inc.	Woodville - Plant #10	886,918	936,774
Sy-5-1	Precision Aggregates II, LLC	Precision Aggregates III, LLC	164,755	140,155
Scioto County				
So-48	Waller Bros. Stone Co.	Inskeep Quarry 1 & 2	160	160
So-76	Waller Bros. Stone Co.	Crabtree Quarry	422	422
So-98	BCE Materials, Inc.	Cab Pit	21,410	21,410
So-DGM	D.G.M., Inc.	Tow Path Lucasville	2,450	2,450
So-Y	Youngs Sand and Gravel	Young	640	540
Seneca County				
Sa-1	Hanson Aggregates Midwest, Inc.	Flat Rock	23,700	23,700
Sa-2	Carmeuse Lime, Inc.	Maple Grove	788,775	788,775
Sa-3	Hanson Aggregates Midwest, Inc.	Bloomville	212,210	239,338
Sa-8	Heitsche North Shore Stone Quarries, LLC	North Shore Stone Quarries	145,706	145,706
Shelby County				
Shy-16	Barrett Paving Materials, Inc.	Rock Run	170,000	0
Shy-17	Barrett Paving Materials, Inc.	Miami River Quarry #400	657,000	666,000
Shy-18	Barrett Paving Materials, Inc.	Jones Deposit	230	230
Shy-SC	Barrett Paving Materials, Inc.	Hardin Sand & Gravel #396	880	194,000
Shy-SC1	Barrett Paving Materials, Inc.	Schmidt Deposit	81,000	0
Stark County				
Cl-P1	Phoenix Asphalt Company, Inc.	Smith Sand & Gravel #1	94,598	94,598
Sk-165	Oster Sand & Gravel, Inc.	Massillon Plant	620,300	620,300
Sk-173	Shelly Materials, Inc.	Massillon Aggregates	684,031	618,045
Sk-243	American Sand & Gravel, Inc.	Plant #4	673,302	673,302
Sk-246	American Landfill, Inc.	American Landfill, Inc.	4,709	4,709
Sk-681	Central-Allied Enterprises, Inc.	Canton Aggregate Div.	1,030,562	1,030,562
Sk-BE	The Beaver Excavating Company	Stone Products	5,046	5,046
Sk-HM	HMS Construction and Rental Co.	HMS Construction and Rental Co.	112,065	112,065
Sk-LM	L & M Mineral Co.	Barr Farm	2,920	2,920
Sk-M	Massillon Materials, Inc.	Massillon Materials, Inc.	273,505	273,505
Sk-M1	Massillon Materials, Inc.	MMI Warmington Plant	129,959	129,959
Sk-O	Oxford Mining Co., LLC	Pero	64,944	66,725
Sk-T	Tiger Sand & Gravel, LLC	Tiger Sand & Gravel, LLC	517,080	533,846
Summit County				
St-55	Perrin Family, LLC	Perrin	100	100
St-9127	Cargill Salt	Cargill Salt	322,802	646,132
St-B	Bontrager Excavating Co.	Gilbert	13,735	13,735
Trumbull County				
Tl-L	Lafarge North America, Inc.	Lordstown Construction Recovery	33,923	33,923
Tuscarawas County				
Ts-125	Stocker Sand & Gravel Co.	Stocker Sand & Gravel Co.- Island	315,550	444,550
Ts-1517	The Belden Brick Company, LLC	Moomaw Pit	28,832	28,832
Ts-1660	Regeneration Materials	Dundee Mine	2,804	3,290
Ts-1818	Kimble Clay & Limestone Co.	Kimble Clay & Limestone Co.	338,140	338,140
Ts-1826	Soehnlen Bros. Sand & Gravel, Inc.	Soehnlen Bros. Sand & Gravel, Inc.	339,238	339,238
Ts-1841	The Belden Brick Company, LLC	Wallick Pit	114,046	42,943
Ts-1884	L & M Mineral Co.	Heil	22,409	22,409
Ts-1914	L & M Mineral Co.	Luikart	15,435	15,435
Ts-1939	The Belden Brick Company, LLC	Shanesville Pit	149,085	150,374
Ts-1960	The Belden Brick Company, LLC	Beagle Pit	33,473	33,473
Ts-1982	L & M Mineral Co.	Spring	135	135
Ts-2001	Newton Asphalt Paving, Inc.	516	111,456	111,456
Ts-2036	Oster Sand & Gravel, Inc.	Oster Sand & Gravel, Inc. - Bolivar	0	36,497
Ts-69	Stocker Sand & Gravel Co.	Stocker Sand & Gravel Co. - Gnaden	378,402	378,402
Ts-HC	Oxford Mining Co., LLC	Strasburg Slurry	3,982	4,016
Ts-K11	Kimble Clay & Limestone Co.	Ervin	28,277	28,277
Ts-K2	Kimble Clay & Limestone Co.	Spooky Hollow – Penn-Ohio Coal Co.	32,494	32,494
Ts-K4	Kimble Clay & Limestone Co.	Spooky Hollow	19,502	19,502
Ts-S2	Sidco Development, Inc.	Midvale Sand & Gravel	211,192	211,192
Ts-TR	Rosebud Mining Company	Tusky Mine	162,874	162,874
Union County				
Un-1	Shelly Materials, Inc.	York Center Quarry	647,683	589,206
Un-2	Shelly Materials, Inc.	Ostrander Quarry	1,504,383	1,556,200
Van Wert County				
Vt-1	National Lime & Stone Co.	Delphos Quarry	62,000	62,000
Vt-3	Stoneco, Inc.	Scott Quarry	371,413	340,234
Vt-7	Ridge Township Quarry	Ridge Township Quarry	213,408	213,408
Vinton County				
Jkn-S2 Vn	Sands Hill Mining, LLC	Sands Hill Rockcamp II	203,937	149,971
Vn-191 Vn	Waterloo Coal Co., Inc.	Dundas-Oreton	1,929	7,270
Warren County				
Wan-38	Martin Marietta Aggregates	Franklin Gravel	20,679	20,679
Wan-41	Carl E. Oeder and Sons Sand & Gravel	Carl E. Oeder and Sons Sand & Gravel	372,009	372,009
Wan-46	Little Miami Sand & Gravel	Little Miami Sand & Gravel Plant #2	20	20
Wan-50	L & I Natural Resources, Inc.	L & I Pit & Mill	72,851	72,851
Wan-7	Eagle Materials, LLC	Plant #7	90,442	90,442
Wan-B	Little Miami Sand & Gravel	Little Miami Sand & Gravel Plant #1	450	450
Wan-MV	Miami View Mining Co., Ltd.	Miami View	99,011	99,011
Wan-R	Daniel L. Browning Riverside Sand & Gravel	Riverside Sand and Gravel	2,400	2,400
Washington County				
Ne-BN7	B & N Coal, Inc.	Mantel Mine	59,617	59,617
Wn-508	Briggs Sand & Gravel, Inc.	Briggs Sand & Gravel, Inc.	29,825	29,825
Wn-54	Atlas Towing Co.	Belpre Bank Run	5,299	5,299
Wn-B	Burkhart Trucking, Inc.	Triple B #2	522	522
Wn-B1	Burkhart Trucking, Inc.	Triple B #1	40,212	40,212
Wn-SM	Shelly Materials, Inc.	Reno	386,719	390,233
Wn-SS	Sharon Stone Co.	Belpre Sand & Gravel	343,339	343,339
Wayne County				
We-11	Olen Corp.	Wooster - Plant #8	341,054	304,636
We-15	Zollinger Sand & Gravel Co.	Zollinger Sand & Gravel Co.	5,158	5,158
We-25	Route 3 Stone Products	Crushers Stone Products, LLC	7,125	7,125
We-7	Rupp Construction, Inc.	Rupp Construction, Inc.	115,349	115,349
We-9129	Morton International, Inc.	Morton Salt Well Field 9129	438,904	424,276
We-EA	Wood Land & Cattle Co., Ltd.	#1	89,986	89,986
We-M	Mt. Eaton Reclamation, Inc.	Mt. Eaton Reclamation, Inc.	1,666	1,666
Williams County				
Ws-21	Thiel Construction Co., Inc.	Thiel Construction Co.	305	305
Wood County				
Wd-1	Gerken Materials, Inc.	Gerken Materials, Inc.	163,226	259,258
Wd-11	Stoneco, Inc.	Portage Quarry	48,965	121,932
Wd-14	Precision Aggregates II, LLC	Precision Aggregates II, LLC	180,407	156,158
Wd-5	Custar Stone Co., Inc.	Custar Stone Co., Inc.	439,603	404,786
Wd-6	Stoneco, Inc.	Lime City Quarry	560	1,120
Wd-C	Cardinal Aggregates, Inc.	Cardinal Aggregates	633,921	627,333
Wd-W	Wylie and Sons Landscaping LLC	Wylie & Sons	227,640	227,640
Wyandot County				
Wt-1	National Lime & Stone Co.	Carey Plant	4,501,000	4,501,000
Wt-3	Olen Corp.	Upper Sandusky - Plant #6	555,943	570,691
Wt-8	Stoneco, Inc.	Carey Quarry	2,571,614	2,536,495
Wt-J	JALIP, Ltd.	JALIP, Ltd.	7,390	7,390
Wt-K	Kirby's Sand & Gravel, Inc.	Kirby's Sand & Gravel, Inc.	115,692	115,692
Wt-N	National Lime & Stone Co.	Upper Sandusky Plant	193,000	193,000

Recommended bibliographic citation

Wright, C.E., 2019, Map of active mineral industry operations in Ohio, 2018: Columbus, Ohio Department of Natural Resources, Division of Geological Survey Map IM-1 2018 Edition, scale 1:500,000.