2024 REPORT ON

OHIO MINERAL INDUSTRIES



compiled by Christopher E. Wright

OHIO GEOLOGICAL SURVEY
DEPARTMENT OF NATURAL RESOURCES





DISCLAIMER: The information contained herein has not been reviewed for technical accuracy and conformity with current ODNR Division of Geological Survey standards for published or open-file materials. The ODNR Division of Geological Survey does not guarantee this information to be free from errors, omissions, or inaccuracies and disclaims any responsibility or liability for interpretations or decisions based thereon.

Graphic design & layout: Jeremy E. Gladden
Editing: Keni Brown
Front cover: An outcrop of Columbus Limestone at the Olen Corporation, Plant #4 in Franklin County, Ohio.

Recommended citation: Wright, C.E., compiler, 2025, 2024 Report on Ohio mineral industries—An annual summary of the state's economic geology: Columbus, Ohio Department of Natural Resources, Division of Geological Survey, 22 p.

2024 Report on Ohio mineral industries: An annual summary of the state's economic geology

compiled by
Christopher E. Wright

STATE OF OHIO
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL SURVEY
D. Mark Jones, Chief

Columbus 2025

PREFACE

The *2024 Report on Ohio Mineral Industries* continues 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 provides a brief discussion of each geologic commodity and a list of commodity statistics for 2024, determined based on data reported to the ODNR Division of Geological Survey. Percent change comparisons of 2024 production and sales values for each commodity with those of the previous year are notated, with the 2023 data coming from the 2023 edition of this report (Wright, 2024).

The *Map of Active Mineral Industry Operations in Ohio* is included at the end of the report and acts 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.

Detailed commodity information for all mineral industries, including sales, production, value, and company information for each of the operators who reported activity in 2024 is available on the ODNR Division of Geological Survey website at **ohiodnr.gov/industrialminerals**.

Chris Wright
Geology Program Supervisor

CONTENTS

Preface v
2024 Ohio economic geology in brief 1
Coal 3
Industrial minerals 7
Limestone and dolomite 9
Sand and gravel 13
Sandstone and conglomerate 16
Clay and shale 18
Salt 21
References cited 22

FIGURES

1. Map showing total value of coal sold in Ohio in 2024, by county 1
2. Map showing total value of industrial minerals sold in Ohio in 2024, by county 1
3. Graphs showing production of coal, industrial minerals, and oil and gas in Ohio since 1960 2
4. Stratigraphic column of coals mined in Ohio during 2024 3
5. Map showing coal sales in Ohio in 2024, by county and quantity 4
6. Graph showing sales and value of coal in Ohio since 1910 5
7. Stratigraphic column of nonfuel industrial minerals typically mined in Ohio 11
8. Map showing sales of limestone and dolomite in Ohio in 2024, by county and quantity 12
9. Graph showing sales and value of limestone and dolomite in Ohio since 1960 12
10. Map showing sales of sand and gravel in Ohio in 2024, by county and quantity 13
11. Graph showing sales and value of sand and gravel in Ohio since 1960 15
12. Map showing sales of sandstone and conglomerate in Ohio in 2024, by county and quantity 16
13. Graph showing sales and value of sandstone and conglomerate in Ohio since 1960 17
14. Map showing clay sales in Ohio in 2024, by county and quantity 19
15. Map showing shale sales in Ohio in 2024, by county and quantity 19
16. Graph showing sales and value of clay in Ohio since 1960 19
17. Graph showing sales and value of shale in Ohio since 1960 19
18. Map showing counties producing salt in Ohio in 2024 and their rankings in sales 21
19. Graph showing sales and value of salt in Ohio since 1960 21

TABLES

1. Fuel and nonfuel mineral sales and production in Ohio in 2024 2
2. Ohio coal production and sales by county in 2024, in descending order of production 4
3. Ohio coal production in 2024, by production size group and change from 2023 4
4. Ohio coal production in 2024, by county and mining method 4
5. Ohio coal production in 2024, by county and seam 5
6. Disposition of Ohio coal in 2024, by county 5
7. Dollar value of coal at mine in 2024, by county and mining method 6
8. Wage and salary payments to Ohio coal mine employees in 2024, by county and occupational group 6
9. Value of Ohio industrial minerals in 2024 7
10. Employment at Ohio industrial mineral operations in 2024, by county 8
11. Ohio limestone and dolomite sales in 2024, by county and use 10
12. Production of lime from Ohio in 2024, by county and use 12
13. Ohio sand and gravel sales in 2024, by county and use 14
14. Ohio sales of crushed sandstone and conglomerate in 2024, by county and use 17
15. Ohio sales of dimension sandstone in 2024, by county and use 17
16. Ohio clay sales in 2024, by county and use 20
17. Ohio shale sales in 2024, by county and use 20

2024 OHIO ECONOMIC GEOLOGY IN BRIEF

In 2024, the total value[1] of coal was $84,155,964 and the total value[1] of all industrial minerals was $1,692,070,076 (figs. 1 and 2; table 1); their combined value is equivalent to $1,776,226,040 or approximately $150 per capita. The total value of nonfuel industrial minerals exceeded $1 billion for the eleventh straight year. The total production of coal was 1,886,699 tons; the total industrial mineral production was 109,676,232 tons. The combined coal and industrial minerals production in Ohio during 2024 was 111,562,931 tons or approximately 9.4 tons per capita (fig. 3A), which is down 1.4% from 2023 production. In 2024, Ohio produced 36,651,332 barrels of oil, which is up 22.2% from 2023 production; also in 2024, Ohio produced 2,154,297,620 thousand cubic feet of natural gas, which is down 2.2% from 2023 production (fig. 3B).

Reported and estimated total direct employment in the extractive industries of Ohio in 2024 totaled over 10,000 people. Industrial mineral production increased for shale, as well as sand and gravel, while production decreased for limestone and dolomite, salt, coal, sandstone and conglomerate, clay, and peat. In 2024, the production-leading commodity of limestone and dolomite was down 0.5% from 2023, with the second-leading commodity of sand and gravel up 0.1% from 2023; the third-leading commodity of salt was down 11.3% from 2023; the fourth-leading commodity of coal was down 9.7% from 2023.

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

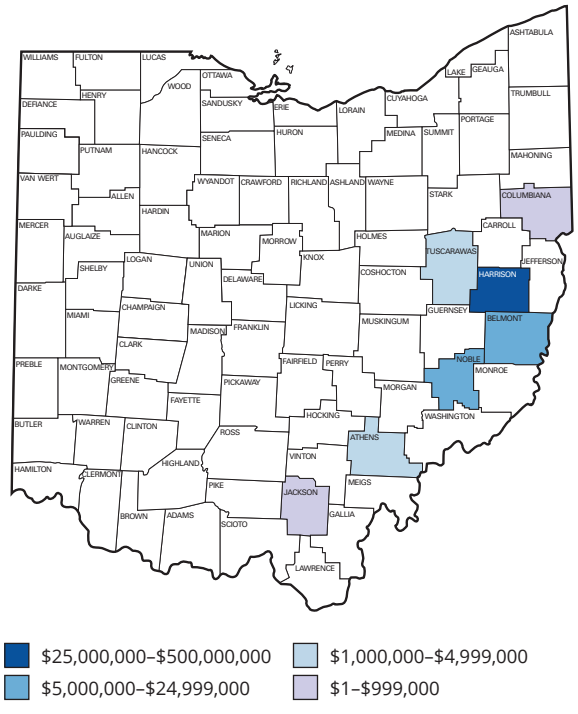


FIGURE 1. Total value of coal sold in Ohio in 2024, by county.

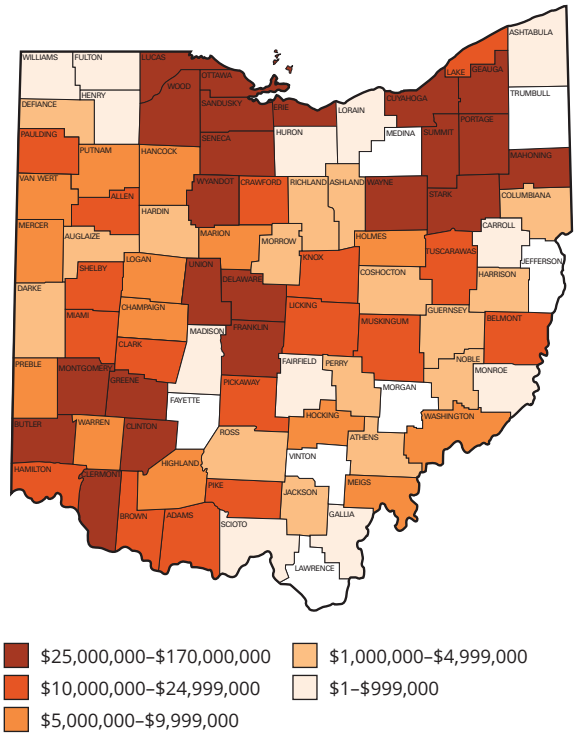


FIGURE 2. Total value of industrial minerals sold in Ohio in 2024, by county.

TABLE 1. ***Fuel and nonfuel mineral sales and production in Ohio in 2024***

Commodity	*Production*[1]	*Sales*[2]	*Value*[3]	*Change in value from 2023 (percent)* [4]
Limestone and dolomite	73,019,943 tons	70,316,064 tons	$1,050,019,848	+5.1
Coal	1,886,699 tons	1,879,283 tons	$84,155,964	–33.6
Sand and gravel	30,050,959 tons	29,457,162 tons	$329,498,238	+7.1
Salt	4,180,540 tons	4,239,773 tons	$243,602,049	+3.6
Sandstone and conglomerate	1,368,564 tons	1,465,075 tons	$55,856,834	–2.7
Shale	535,352 tons	549,192 tons	$5,620,178	–1.9
Clay	520,874 tons	528,141 tons	$7,472,929	–30.9
Peat	0 tons	0 tons	$0	–100.0
Gas	2,154,297,620 thousand cubic feet	not available	not available	not available
Oil	36,651,332 barrels	not available	not available	not available

[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 (free on board; value of mined product excluding insurance or transportation costs) 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 statewide-average price per ton based on reported FOB values.
[4]Percent change in value for peat is based on production in 2023, when peat was last mined in Ohio.

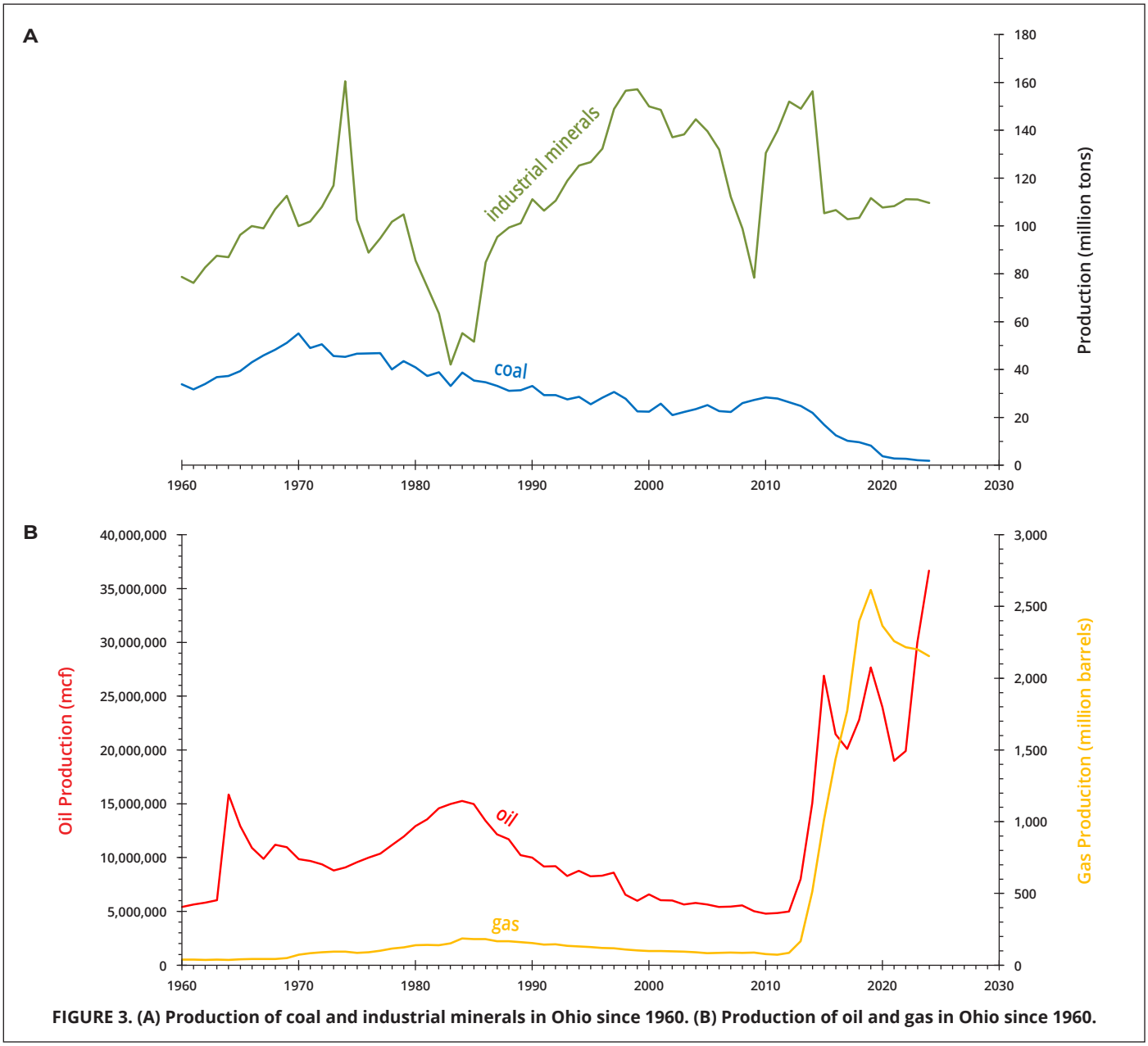


FIGURE 3. (A) Production of coal and industrial minerals in Ohio since 1960. (B) Production of oil and gas in Ohio since 1960.

COAL

Commodity summaries and directories of operators are available at: ohiodnr.gov/industrialminerals.

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). Ohio 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, over 4 billion tons of coal have been mined from coal seams in the state (fig. 4; Crowell, 1995); this represents a value of more than $200 billion in 2024 dollars.[2]

Throughout 2024, ODNR issued one surface-mine expansion permit and no underground-mine expansion permits. There were three new surface mine permits issued and no new underground mines permitted. Several coal operations ceased or curtailed production in 2024 because of less-expensive, competing natural gas and decreased demand.

[2]The following link provides more information about the formation and uses of Ohio's coal resources: **ohiodnr.gov/coalgeology**.

Production

- Tons produced = 1,886,699 (−9.7% from 2023)
- U.S. ranking:
  - 16th out of 21 producing states (**USDOE, 2024**)
- Top producing seams (table 5):
  - Upper Freeport (No. 7)
  - Meigs Creek (No. 9, Sewickley)
  - Pittsburgh (No. 8)

Sales

(figs. 5 and 6; tables 2, 6, and 7)

- Tons sold = 1,879,283 (−10.4% from 2023)
- Value = $84,155,964
- Leading counties (percentage of statewide sales):
  - Harrison (53.5%)
  - Noble (19.5%)
  - Belmont (18.3%)
  - Tuscarawas (5.6%)

Employment

(table 8)

- Production employees reported = 271
- Nonproduction employees reported = 76
- Average employee wages:
  - Surface-mine production = $53,694
  - Underground-mine production = $96,422
- Total wages earned = $25,960,616

SYSTEM	GROUP	LITHOSTRATIGRAPHIC UNITS
Permian	Dunkard	Washington (No. 12) coal
Pennsylvanian	Monongahela	Waynesburg (No. 11) coal Uniontown (No. 10) coal Meigs Creek (No. 9, Sewickley) coal Pomeroy (No. 8a, Redstone) coal Pittsburgh (No. 8) coal
	Conemaugh	Ames marine zone Harlem coal Anderson coal Wilgus coal Brush Creek marine zone Mahoning (No. 7a) coal
	Allegheny	Upper Freeport (No. 7) coal Lower Freeport (No. 6a) coal Middle Kittanning (No. 6) coal Strasburg (No. 5a) coal Lower Kittanning (No. 5) coal Vanport marine zone Clarion (No. 4a) coal Winters coal Newland (No. 4, Brookville) coal
	Pottsville	Tionesta (No. 3b) coal Upper Mercer (No. 3a) coal Lower Mercer (No. 3) coal Quakertown (No. 2) coal Sharon (No. 1) coal

FIGURE 4. Stratigraphic column of coals mined in Ohio during 2024 (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).

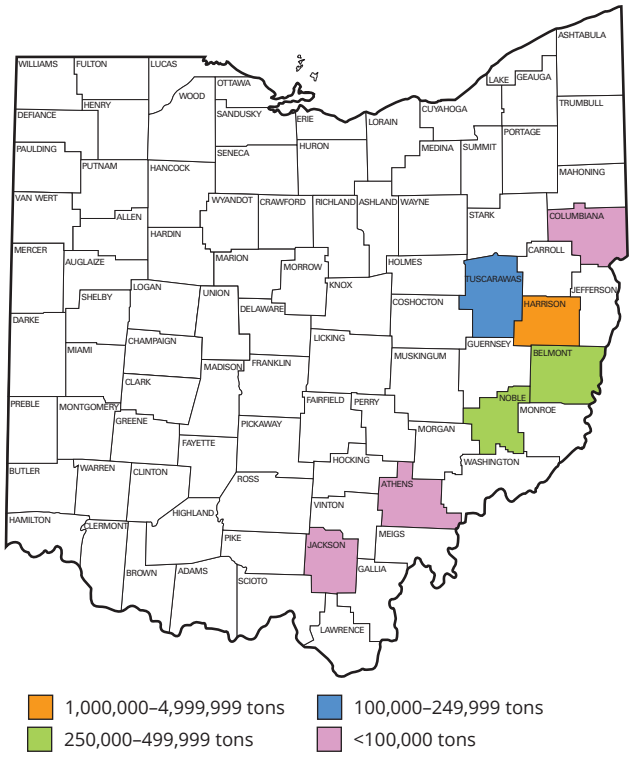


FIGURE 5. Coal sales in Ohio in 2024, by county and quantity.

TABLE 2. ***Ohio coal production and sales by county in 2024, in descending order of production***

County	*Production (short tons)*	*Sales (short tons)*
Harrison	1,019,719	1,005,587
Noble	365,624	365,624
Belmont	337,504	343,357
Tuscarawas	104,325	104,842
Athens	58,839	59,105
Jackson	628	628
Columbiana	60	140
TOTAL	1,886,699	1,879,283

TABLE 3. ***Ohio coal production in 2024, by production size group and change from 2023***

Production size group	*2024*		*Change from 2023 (short tons)*
	Number of mines reporting	*Production (short tons)*	
1,000,000 tons and over	0	0	0
500,000 to 999,999 tons	1	559,753	36,215
250,000 to 499,999 tons	0	0	0
100,000 to 249,999 tons	5	881,292	–198,437
50,000 to 99,999 tons	3	227,887	–106,715
25,000 to 49,999 tons	4	141,024	51,858
Less than 25,000 tons	11	76,743	14,326
TOTAL	24	1,886,699	–202,753

TABLE 4. ***Ohio coal production in 2024, 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*
Athens	58,839	1					1	58,839	28,295	30,544	0
Belmont	337,504	3					3	337,504	266,370	30,282	40,852
Columbiana	60	1					1	60	60	0	0
Harrison	1,019,719	5	2	791,290	0	791,290	3	228,429	217,516	10,913	0
Jackson	628	1					1	628	628	0	0
Noble	365,624	5					5	365,624	365,624	0	0
Tuscarawas	104,325	8					8	104,325	101,179	0	3,146
TOTAL[1]	1,886,699	24	2	791,290	0	791,290	22	1,095,409	979,672	71,739	43,998

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

TABLE 5. ***Ohio coal production in 2024, by county and seam***

County[1]	Production (short tons)									
	Total	Newland (No. 4, Brookville)	Lower Kittanning (No. 5)	Strasburg (No. 5a)	Middle Kittanning (No. 6)	Lower Freeport (No. 6a)	Upper Freeport (No. 7)	Pittsburgh (No. 8)	Pomeroy (No. 8a, Redstone)	Meigs Creek (No. 9, Sewickley)
Athens	58,839				58,839					
Belmont	337,504							199,615		137,889
Columbiana	60				60					
Harrison	1,019,719					577	791,613	213,723	1,836	11,970
Jackson	628		628							
Noble	365,624									365,624
Tuscarawas	104,325	23,445	40,531	2,111	38,238					
TOTAL[2]	1,886,699	23,445	41,159	2,111	97,137	577	791,613	413,338	1,836	515,483

[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. ***Disposition of Ohio coal in 2024, by county***

County[1]	Number of mines	Disposition[1] (short tons)					Stored
		Total[2]	Rail	Water	Truck	Conveyor	
Athens	1	59,105			59,105		
Belmont	3	343,357			343,357		
Columbiana	1	140			140		
Harrison	5	1,005,587	214,022		791,565		9,242
Jackson	1	628			628		
Noble	5	365,624			365,624		
Tuscarawas	8	104,842			104,842		
TOTAL[3]	24	1,879,283	214,022	0	1,665,261	0	9,242

[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.

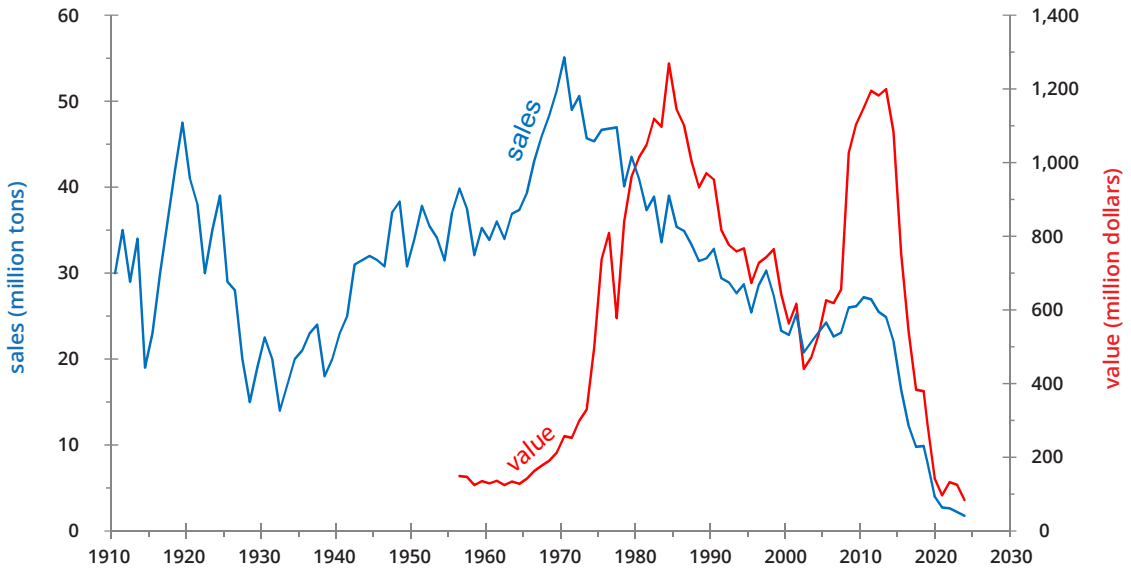


FIGURE 6. Sales and value of coal in Ohio since 1910.

TABLE 7. ***Dollar value of coal at mine in 2024, by county and mining method***

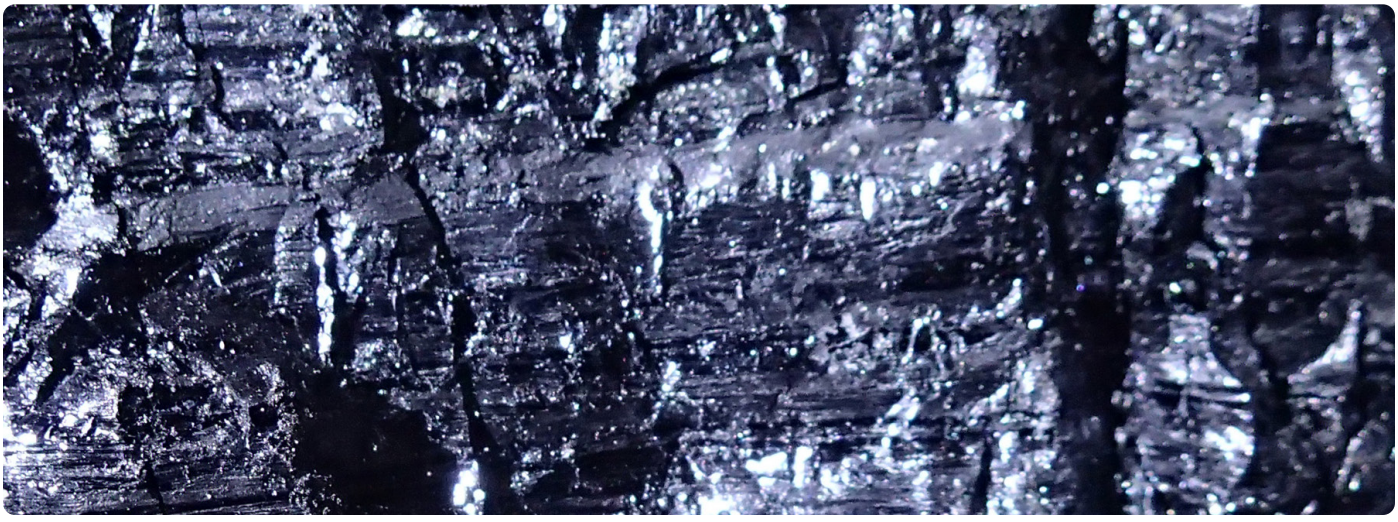
County[1]	Total				Underground				Surface			
	No. of mines	Tonnage sold (short tons)	Value at mine[2] (dollars)	Per ton average (dollars)	No. of mines	Tonnage sold (short tons)	Value at mine[2] (dollars)	Per ton average (dollars)	No. of mines	Tonnage sold (short tons)	Value at mine[2] (dollars)	Per ton average (dollars)
Athens	1	59,105	$2,232,364	$37.77					1	59,105	$2,232,364	$37.77
Belmont	3	343,357	$18,366,100	$53.49					3	343,357	$18,366,100	$53.49
Columbiana	1	140	$13,725	$98.04					1	140	$13,725	$98.04
Harrison	5	1,005,587	$46,744,829	$46.49	2	773,775	$32,266,417	$41.70	3	231,812	$14,478,412	$62.46
Jackson	1	628	$26,188	$41.70					1	628	$26,188	$41.70
Noble	5	365,624	$14,624,960	$40.00					5	365,624	$14,624,960	$40.00
Tuscarawas	8	104,842	$2,147,798	$20.49					8	104,842	$2,147,798	$20.49
TOTAL	24	1,879,283	$84,155,964	$44.78	2	773,775	$32,266,417	$41.70	22	1,105,508	$51,889,547	$46.94

[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 (free on board; value of mined product excluding insurance or transportation costs) 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. ***Wage and salary payments to Ohio coal mine employees in 2024, by county and occupational group***

County[1]	Wage and salary payments (nearest whole dollar)[2]			
	All occupations	Underground production employees	Surface production employees	Other
Athens	$692,453		$495,244	$197,209
Belmont	$4,706,918		$3,464,289	$1,242,629
Harrison	$13,922,660	$10,124,266	$1,078,182	$2,720,212
Noble	$3,443,166		$3,443,166	
Tuscarawas	$615,550		$432,400	$183,150
Vinton	$371,293			$371,293
TOTAL[3]	$23,752,040	$10,124,266	$8,913,281	$4,714,493

[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

Commodity summaries and directories of operators are available at: ohiodnr.gov/industrialminerals.

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 and household 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 within clay-rich glacial tills. The Pennsylvanian-age cyclic sedimentation in eastern Ohio includes coals, clays, shales, sandstones, and limestones in close proximity, allowing for economic recovery of multiple commodities.[3]

Industrial minerals were reported as produced or sold at 327 operations in 81 Ohio counties during 2024. The combined value of all industrial minerals sold in 2024 was $1,692,070,076 (table 9). This is the eleventh consecutive year that the combined value of all nonfuel minerals has exceeded $1 billion. The statewide combined employment for all nonfuel industrial mineral extraction was 3,851 employees (table 10).

In 2024, peat sales were not reported; when produced, it is typically by a company that also produces sand and gravel and/or clay. Peat production and sales have been sporadic in Ohio since 2000. In recent years peat production and sales have been very marginal to small, generally having a negligible effect on the total value of all industrial minerals mined in Ohio (table 9).

[3]The following links provide more information on the general bedrock and glacial geology of Ohio: **ohiodnr.gov/bedrockgeology** and **ohiodnr.gov/glacialgeology**.

TABLE 9. ***Value of Ohio industrial minerals in 2024***

Commodity	*Sales (tons)*	*Change from 2023 (tons/percent)*	*Value*[1]	*Percent of total value*
Limestone and dolomite	70,316,064	–2,401,857/–3.3	$1,050,019,848	62.1
Sand and gravel	29,457,162	–243,798/–0.8	$329,498,238	19.5
Salt	4,239,773	–30,660/–0.7	$243,602,049	14.4
Sandstone and conglomerate	1,465,075	+162,898/+12.5	$55,856,834	3.3
Shale	549,192	+132,696/+31.9	$5,620,178	0.3
Clay	528,141	–556,346/–51.3	$7,472,929	0.4
Peat	0	–150/–100.0	$0	0.0
TOTAL	106,555,407	–2,937,217/–2.7	$1,692,070,076	100.0

[1]The FOB value (free on board; value of mined product excluding insurance or transportation costs) 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 statewide-average price per ton based on reported FOB values.



TABLE 10. ***Employment at Ohio industrial mineral operations in 2024, by county***

County	*Total Employees*[2]	*Production Employees*	*Nonproduction Employees*
Adams	18	11	7
Allen	35	21	14
Ashland	17	12	5
Ashtabula	54	4	50
Athens	18	10	8
Auglaize	11	8	3
Belmont	158	39	119
Brown	32	18	14
Butler	132	51	81
Carroll	1	1	0
Champaign	13	10	3
Clark	14	8	6
Clermont	62	56	6
Clinton[1]	0	0	0
Columbiana	8	6	2
Coshocton	29	22	7
Crawford	13	13	0
Cuyahoga	252	220	32
Darke	4	3	1
Defiance	10	7	3
Delaware	26	26	0
Erie	137	77	60
Fairfield	2	1	1
Franklin	151	87	64
Fulton	4	1	3
Gallia[1]	0	0	0
Geauga	80	65	15
Greene	46	39	7
Guernsey	2	2	0
Hamilton	118	65	53
Hancock	2	2	0
Hardin	22	12	10
Harrison	2	2	0
Henry[1]	0	0	0
Highland	23	17	6
Hocking	45	16	29
Holmes	43	25	18
Huron	1	1	0
Jackson	7	5	2
Knox	82	39	43
Lake	87	59	28
Licking	35	23	12
Logan	68	47	21
Lorain	4	3	1
Lucas	79	56	23
Madison	6	2	4
Mahoning	75	52	23
Marion	15	13	2
Meigs	24	18	6
Mercer	31	14	17
Miami	36	33	3
Monroe	4	3	1
Montgomery	54	46	8
Morrow	6	6	0
Muskingum	62	48	14
Noble	17	14	3
Ottawa	127	90	37
Paulding	53	34	19
Perry	13	8	5
Pickaway	22	11	11
Pike	7	6	1
Portage	171	125	46
Preble	29	22	7
Putnam	2	2	0
Richland	10	10	0
Ross	14	13	1
Sandusky	215	189	26
Scioto	14	11	3
Seneca	71	50	21
Shelby	15	11	4
Stark	82	67	15
Summit	100	1	99
Tuscarawas	182	54	128
Union	57	34	23
Van Wert	40	24	16
Warren	20	12	8
Washington	44	19	25
Wayne	75	41	34
Williams[1]	0	0	0
Wood	56	32	24
Wyandot	155	113	42
TOTAL 81 counties	3,851	2,418	1,433

[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

Limestone and dolomite are Ohio's most versatile industrial minerals. Each is used as aggregate in the construction industry, 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 = 73,019,943 (−0.5% from 2023)
- U.S. ranking:
  - 5th out of 50 producing states for crushed stone (**USGS, 2024a**)
  - In the top 4 of the 28 producing states for lime (**USGS, 2024b**)
- Top producing geologic units (fig. 7):
  - Columbus/Delaware Limestones (Devonian)
  - Lockport Dolomite (Silurian)
  - Greenfield/Peebles/Tymochtee Dolomites (Silurian)
  - Cedarville Dolomite (Silurian)

Sales

(figs. 8 and 9)

- Tons sold = 70,316,064 (−3.3% from 2023; tables 11 and 12)
- Value[4] = $1,050,019,848 (table 9)
- Leading counties (percentage of statewide sales):
  - Franklin (14.1%)
  - Wyandot (11.3%)
  - Delaware (7.3%)
  - Ottawa (6.6%)

Employment

(table 10)

- Production employees reported = 1,187
- Nonproduction employees reported = 597
- Average employee annual wage = $67,539
- Total wages earned = $99,874,679
- Average days worked per operation = 206

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



TABLE 11. ***Ohio limestone and dolomite sales in 2024, 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	1,029,248	1,029,248									1,029,248				
Allen	811,266	807,141	3,208		59,803	84,554	22,691	57,236			579,649			4,125	
Auglaize	216,000	216,000									216,000				
Belmont	965,142	965,142	80,748				364,587				519,807				
Brown	1,695,025	1,695,025									1,695,025				
Clark	81,000	81,000						81,000							
Clermont	2,252,414	2,252,414			150,226	384,775		1,717,413							
Clinton	2,404,579	2,383,353	50,454		240,410	601,504	721,230	768,592	1,163					21,226	
Coshocton	18,084											18,084			
Crawford	1,057,000	1,057,000									1,057,000				
Delaware	5,145,375	5,145,375									5,145,375				
Erie	3,752,682	3,750,720	5,924				259,570				3,485,226	131		1,831	
Franklin	9,908,386	9,847,339	24,108		551,294	526,424	272,512	2,663,746			5,809,255			61,047	
Greene	2,086,366	2,086,366			800,067		158,094	633,953			494,252				
Guernsey	94,506	94,506									94,506				
Hancock	476,000	476,000									476,000				
Hardin	180,325	180,325									180,325				
Harrison	137,302	137,302					137,302								
Highland	438,334	419,972	3,931			60,000	30,000	326,041						18,362	
Holmes	1,626											1,626			
Knox	25,123	25,123				1,019		24,104							
Licking	6,923	6,923						6,923							
Logan	667,468	667,468	38,440		263,593		27,458	219,661			118,316				
Lucas	2,205,241	2,205,241									2,205,241				
Madison	1,508	1,508	1,508												
Mahoning	1,915,507	1,915,507									1,915,507				
Marion	564,000	564,000									564,000				
Mercer	627,354	627,354									627,354				
Miami	1,297,061	1,192,616	2,860	7,461	109,434	13,850	265,478	324,583		150,583	318,367			104,445	
Montgomery	980,832	980,832			163,202			58,704			758,926				
Muskingum	990,388	990,388	2,494								987,894				
Noble	255,798	255,798	12,620				231,653				11,525				
Ottawa	4,609,761	4,435,650	5,998		771,789	99,688	1,912,971				1,645,204				174,111
Paulding	1,179,170	747,385									747,385		431,785		
Perry	198,527	198,527	13,527					185,000							
Pickaway	466,092	466,092	6,000		80,000	100,000	100,000	100,000	10,000		70,092				
Pike	1,312,820	1,312,820	35,000		250,000	500,000	250,000	200,000	10,000		67,820				
Preble	231,000	231,000									231,000				
Putnam	436,400	436,400									436,400				
Ross	191,977	191,977					80,000	80,000			31,977				

TABLE 11. ***Ohio limestone and dolomite sales in 2024, by county and use (cont.)***

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				
Sandusky	2,743,099	983,593	8,247		198,390	276,286	111,251	375,034			14,385			19,008	1,740,498
Seneca	2,349,120	1,731,605	4,827	4,855							1,721,923	164		53,709	563,642
Shelby	575,000	575,000									575,000				
Stark	4,067	4,067					4,067								
Tuscarawas	237,228	237,228	8,822				208,806				19,600				
Union	2,751,150	2,751,150									2,751,150				
Van Wert	560,307	560,307									560,307				
Wayne	2,928	2,363						2,363						565	
Wood	2,214,209	2,201,451	17,121		107,129	507,912	493,321	926,166		55	149,747			12,758	
Wyandot	7,965,346	7,960,999			131,333	198,642	480	462,110			7,168,434			4,347	
TOTAL	70,316,064	67,084,600	325,837	12,316	3,876,670	3,354,654	5,651,471	9,212,629	21,163	150,638	44,479,222	20,005	431,785	301,423	2,478,251

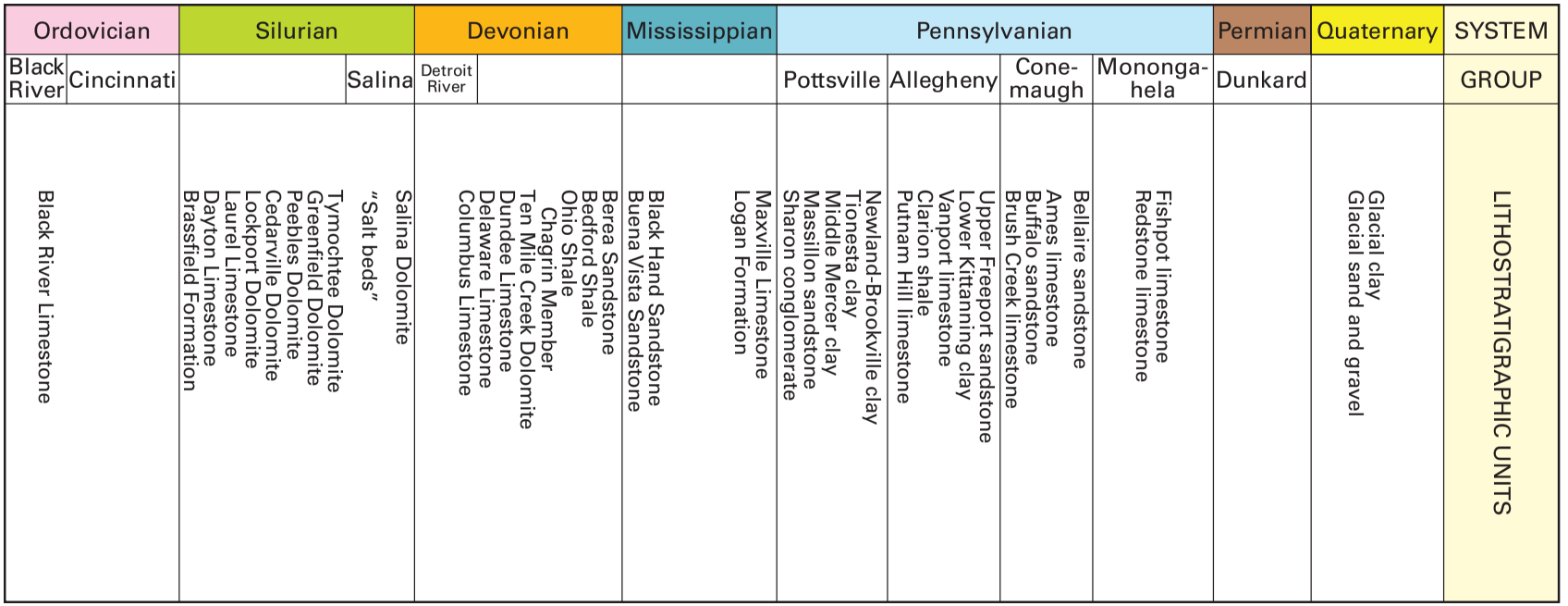


FIGURE 7. Generalized stratigraphic column of nonfuel industrial minerals typically mined in Ohio. Modified from Brant and Delong (1960; table 9), ODNR Division of Geological Survey (1990), and Slucher and others (2006).

TABLE 12. ***Production of lime from Ohio in 2024, by county and use***

County	*Total tons*[1]	*Building (tons)*	*Chemical and industrial (tons)*	*Refractory (tons)*
Ottawa	79,142	57,883	21,259	
Sandusky	756,738		756,738	
Seneca	281,821		281,821	
TOTAL	1,117,701	57,883	1,059,818	0

[1]Burning produced a 45.1% weight loss.

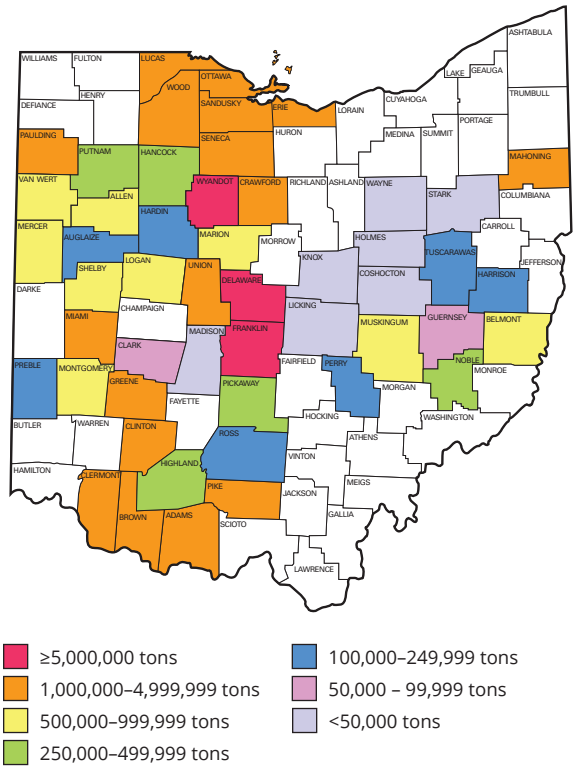


FIGURE 8. Sales of limestone and dolomite in Ohio in 2024, by county and quantity.

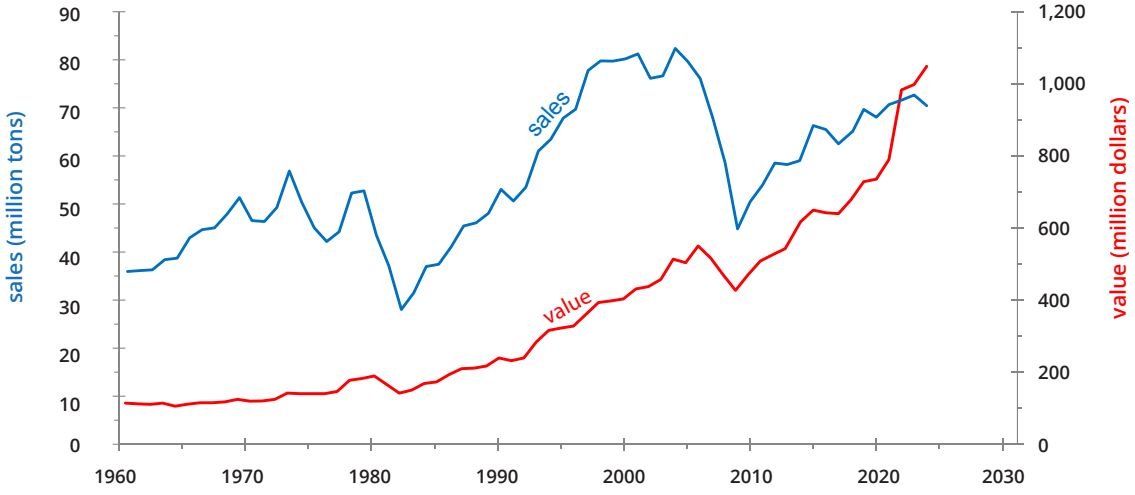


FIGURE 9. Sales and value of limestone and dolomite in Ohio since 1960.

SAND AND GRAVEL

Sand and gravel are common raw materials that are major components 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 (ODNR 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.

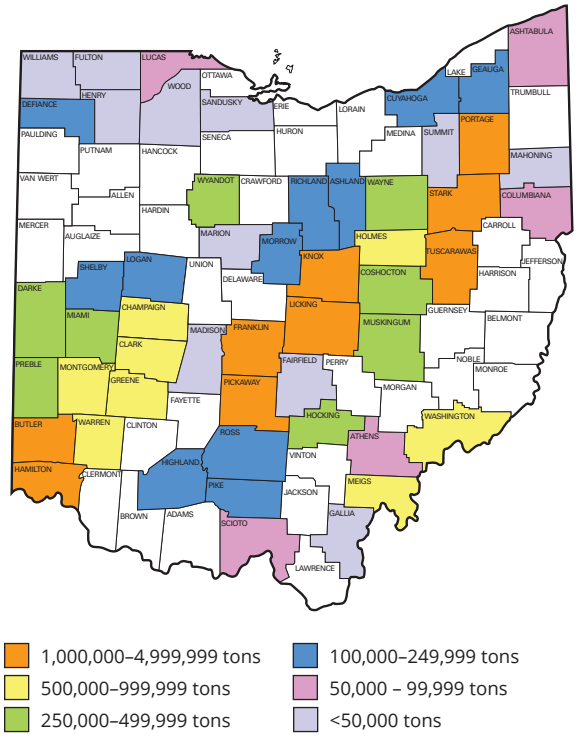


FIGURE 10. Sales of sand and gravel in Ohio in 2024, by county and quantity.

Production

- Tons produced = 30,050,959 (+0.1% from 2023)
- U.S. ranking:
  - The 2024 U.S. state rankings for the 50 sand and gravel producing states were unavailable (**USGS, 2024c**)

Sales

(figs. 10 and 11)

- Tons sold = 29,457,162 (−0.8% from 2023; table 13)
- Value[5] = $329,498,238 (table 9)
- Leading counties (percentage of statewide sales):
  - Stark (12.8%)
  - Portage (10.1%)
  - Hamilton (8.6%)
  - Butler (7.9%)
  - Licking (4.7%)

Employment

(table 10)

- Production employees reported = 892
- Nonproduction employees reported = 612
- Average employee annual wage = $61,411
- Total wages earned = $85,852,135
- Average days worked per operation = 168

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

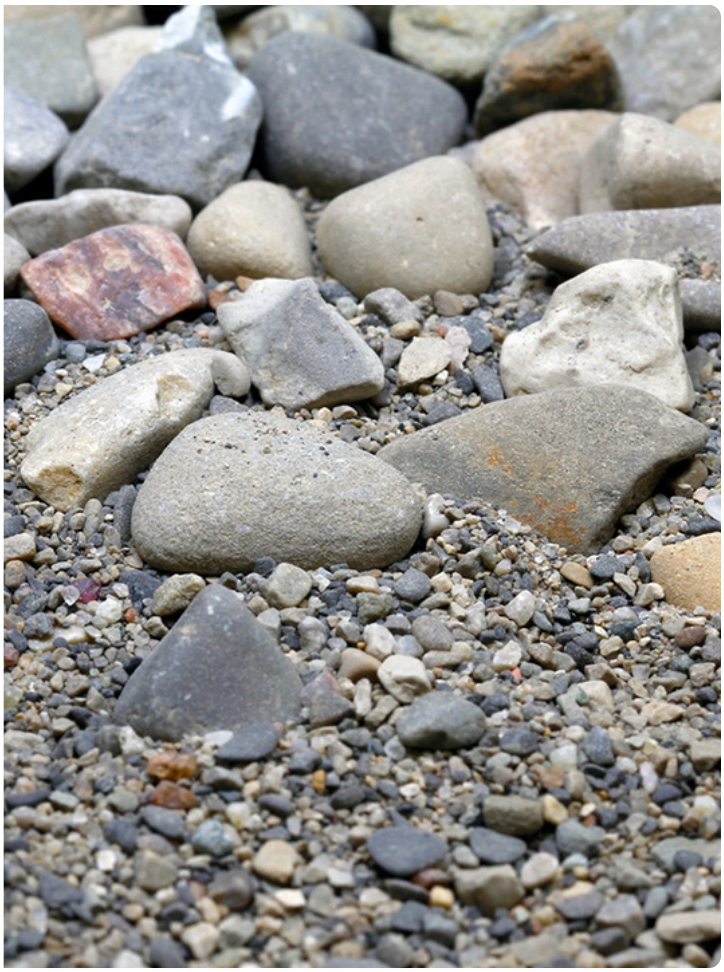


TABLE 13. ***Ohio sand and gravel sales in 2024, by county and use***

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	183,759	43,943	139,816	13,183	41,401					26,366	82,802					4,394	15,613
Ashtabula	83,230	40,816	42,414	4,000	5,600											36,816	36,814
Athens	82,469	50,672	31,797							50,672	31,797						
Butler	2,329,005	822,273	1,506,732	256,960	683,103	74,559	328,133				120,107					490,754	375,389
Champaign	740,696	336,783	403,913	8,010	10,465	49,930	135,495	69,200	7,740	7,980	12,125					201,663	238,088
Clark	874,274	379,871	494,403	3,033	69,041	41,950	76,100	42,493	68,146	20,895	9,616					271,500	271,500
Columbiana	54,960	27,480	27,480													27,480	27,480
Coshocton	343,681	191,198	152,483	3,863	2,275					10,814	10,256	255	318			176,266	139,634
Cuyahoga	113,220	113,220														113,220	
Darke	316,964	137,436	179,528	14,326	16,868	46,710	138,540	68,750	9,980	7,650	14,140						
Defiance	206,124	180,038	26,086	16,836	16,393	163,202											9,693
Fairfield	10,260	6,129	4,131													6,129	4,131
Franklin	1,365,089	809,006	556,083	97,713	331,711	695,404	199,698	15,639	16,801		4,356					250	3,517
Fulton	18,250	9,125	9,125													9,125	9,125
Gallia	1,743	872	871													872	871
Geauga	103,372	51,827	51,545													51,827	51,545
Greene	792,864	468,590	324,274	11,200	7,000	21,675	23,865	52,500	15,550	55,000	7,500					328,215	270,359
Hamilton	2,530,341	1,475,788	1,054,553	497,057	646,833	296,092	127,987				42,645					682,639	237,088
Henry	45,038	45,038		4,000								11,000				30,038	
Highland	155,532	73,261	82,271		27,087	57,659			26,515			15,602	3,520				25,149
Hocking	411,599	252,746	158,853			32,400	12,048	6,720	22,725	4,560	2,062					209,066	122,018
Holmes	800,133	473,149	326,984	45,837	125,944	207,144	50,542	140,122	58,063	53,830	55,477	1,620	36,958			24,596	
Knox	1,342,186	572,748	769,438	4,210	275,306	352,635	134,246	65,557	40,634		117,910		63,364			150,346	137,978
Licking	1,380,293	755,864	624,429	14,051	264,372	316,175	1,093	25,911	5,631		26,030					399,727	327,303
Logan	233,222	97,799	135,423	3,450	3,449	13,476	13,475									80,873	118,499
Lucas	77,512	38,756	38,756												38,756		38,756
Madison	7,335	3,063	4,272													3,063	4,272
Mahoning	49,927	14,974	34,953	4,167	5,567						6,200	3,211	12,100		3,851	3,745	11,086
Marion	8,938	5,071	3,867	3,802		748										521	3,867
Meigs	834,161	571,124	263,037			413,273	116,280									157,851	146,757
Miami	427,687	169,321	258,366	30,479	105,743											138,842	152,623
Montgomery	910,346	471,943	438,403	47,901	73,198	35,800	46,200	10,000		150	30,150		11,000			378,092	277,855
Morrow	199,000	90,000	109,000													90,000	109,000
Muskingum	292,088	239,128	52,960		2,794			81,506	15,007	8,131	3,957	14,090				135,401	31,202
Pickaway	1,307,509	820,575	486,934	836	408			125,000	100,000	125,418	50,407					569,321	336,119
Pike	180,223	135,363	44,860													135,363	44,860
Portage	2,978,855	2,053,584	925,271	168,374	288,088	437,675	51,211	65,795	95,082	210,651	28,515	3,989	34,086			1,167,100	428,289
Preble	404,671	194,387	210,284	53,483	44,627											140,904	165,657
Richland	169,880	115,475	54,405		1,850				19,153		12,348					115,475	21,054
Ross	130,222	95,658	34,564	983	2,131			24,483	5,415	171	1,233					70,021	25,785

TABLE 13. ***Ohio sand and gravel sales in 2024, by county and use (cont.)***

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
Sandusky	736	368	368					368	368								
Scioto	91,781	75,231	16,550	75,231	16,550												
Shelby	199,000	99,500	99,500													99,500	99,500
Stark	3,776,373	2,022,919	1,753,454	75,229	256,996	461,556	47,647	92,433	142,430	328,528	391,845					1,065,173	914,536
Summit	977	488	489													488	489
Tuscarawas	1,178,921	713,337	465,584	222,269	111,255	29,516	16,719	83,266	16,719	222,270	134,892					156,016	185,999
Warren	500,731	222,153	278,578	222,153	278,578												
Washington	569,554	384,282	185,272	26,859	4,592	235,280	9,184		27,968		21,384					122,143	122,144
Wayne	306,339	156,102	150,237	16,871	128,084	110,574	3,819	12,282	8,403	13,817	7,639	2,558	2,292				
Williams	1,347	674	673													674	673
Wood	35,586	17,793	17,793	17,793	17,793												
Wyandot	299,159	172,936	126,223	52,842	43,508	8,403						8,620	70,715			103,071	12,000
TOTAL[1]	29,457,162	16,299,877	13,157,285	2,017,001	3,908,610	4,101,836	1,532,282	982,025	702,330	1,146,903	1,225,393	60,945	234,353	0	42,607	7,948,560	5,554,317

[1]Any tally inconsistencies are due to rounding.

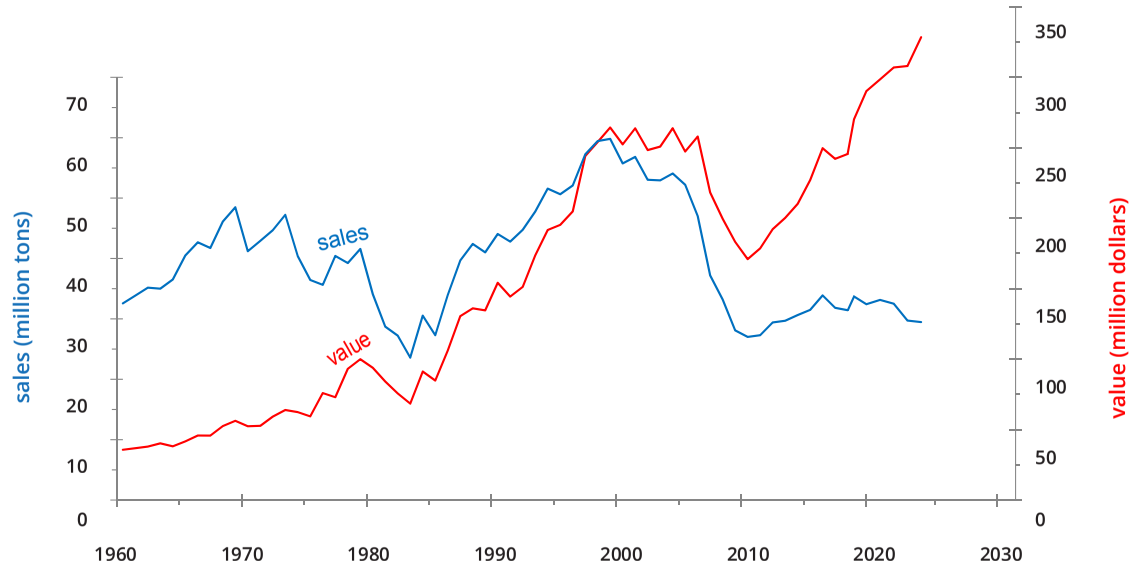


FIGURE 11. Sales and value of sand and gravel in Ohio since 1960.

SANDSTONE AND CONGLOMERATE

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, which supported the steel industry and other 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 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; fig. 7).

Production

- Tons produced = 1,368,564 (−6.9% from 2023)
- U.S. ranking:
  - 5th out of 50 producing states for crushed stone (**USGS, 2024a**)
  - The 2024 U.S. state rankings for the 33 dimension-stone producing states were unavailable (**USGS, 2024d**).
- Top producing geologic units (fig. 7):
  - Sharon Conglomerate (Pennsylvanian)
  - Unidentified Pottsville Group sandstone (Pennsylvanian)
  - Berea Sandstone (Devonian)
  - Unidentified Allegheny Group sandstone (Pennsylvanian)

Sales

(figs. 12 and 13)

- Tons sold = 1,465,075 (+12.5% from 2023; tables 14 and 15)
- Value[6] = $55,856,834 (table 9)
- Leading counties (percentage of statewide sales):
  - Geauga (42.4%)
  - Wayne (23.5%)
  - Tuscarawas (8.3%)
  - Lake (7.0%)
  - Lorain (2.9%)

Employment

(table 10)

- Production employees reported = 231
- Nonproduction employees reported = 96
- Average employee annual wage = $78,325
- Total wages earned = $25,377,449
- Average days worked per operation = 141

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

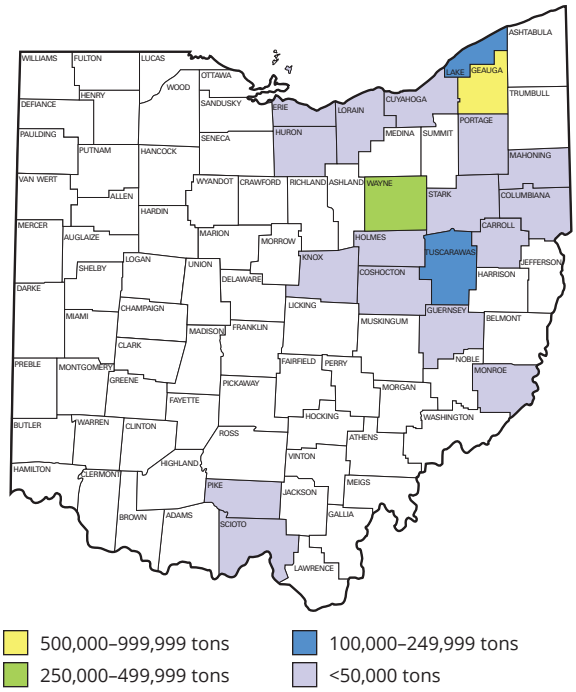


FIGURE 12. Sales of sandstone and conglomerate in Ohio in 2024, by county and quantity.



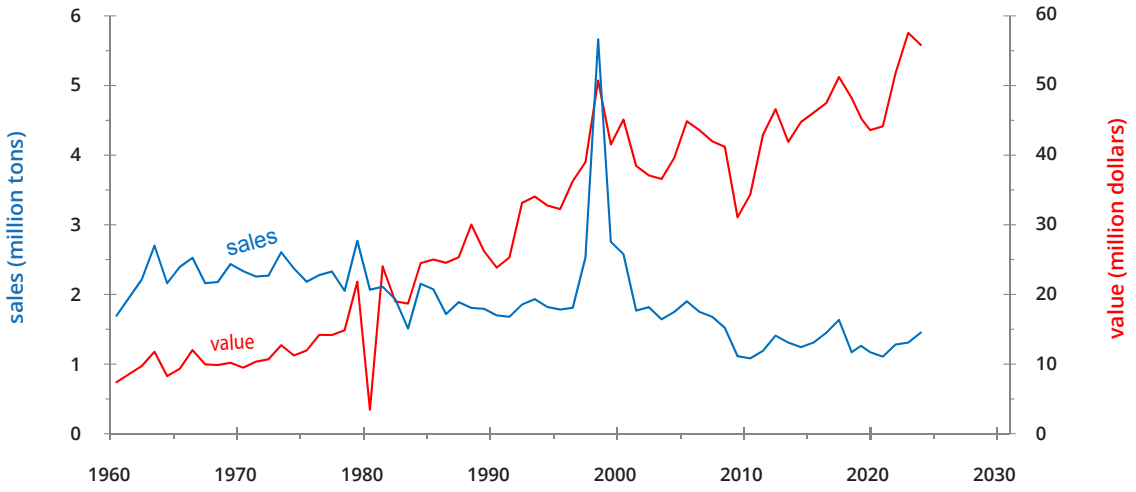


FIGURE 13. Sales and value of sandstone and conglomerate in Ohio since 1960.

TABLE 14. ***Ohio sales of crushed sandstone and conglomerate in 2024, 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	1,438					1,438									
Columbiana	9,937												9,937		
Coshocton	7,802					250	7,552								
Geauga	621,287	53,610	85,009									46	203,670		278,952
Guernsey	31,000					1,000	30,000								
Holmes	153						153								
Huron	2,565						2,565								
Knox	39,532													39,532	
Lake	102,243						66,157						36,086		
Lorain	38,405						38,405								
Mahoning	34,152												34,152		
Monroe	17,294					3,548	13,746								
Pike	41,014												12,455		28,559
Portage	36,578														36,578
Stark	65												65		
Tuscarawas	121,866	178				584							119,833		1,271
Wayne	343,512					40,350	103,161			45			199,956		
TOTAL	1,448,843	53,788	85,009	0	0	47,170	261,739	0	0	45	0	46	616,154	39,532	345,360

TABLE 15. ***Ohio sales of dimension sandstone in 2024, by county and use***

County	Tons sold									
	Total	Refractory	Rough construction	Rubble	Grindstones	Rough architectural	Finished	Curbing	Flagging	Other/ unspecified
Columbiana	451		349			102				
Coshocton	3,304					1,175	2,129			
Cuyahoga	582									582
Erie	5,419		1,596	725		1,762	1,336			
Lorain	3,626						3,626			
Scioto	2,850						2,850			
TOTAL	16,232	0	1,945	725	0	3,039	9,941	0	0	582

CLAY AND SHALE

The ceramics industry in Ohio has a long and dynamic history. Potteries were established by the early 1800s to supply dinnerware; 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 The Ohio State University in 1894. Ohio clay and shale still are being used to produce important ceramic products, though production tonnages are much lower than they were 100 years ago. Ohio's 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 Quaternary-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) = 520,874 (−51.4% from 2023)
- Tons produced (shale) = 535,352 (+28.5% from 2023)
- The 2024 U.S. state rankings for the 38 states producing clay and shale were unavailable (**USGS, 2024e**).

Sales

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

- Clay:
  - Tons sold = 528,141 (−51.3% from 2023; table 16)
  - Value[7] = $7,472,929 (table 9)
- Leading counties for clay (percentage of statewide sales):
  - Tuscarawas (49.2%)
  - Paulding (13.9%)
  - Athens (8.5%)
  - Licking (7.9%)
  - Jackson (5.4%)
- Shale:
  - Tons sold = 549,192 (+31.9% from 2023; table 17)
  - Value[8] = $5,620,178 (table 9)
- Leading counties for shale (percentage of statewide sales):
  - Tuscarawas (25.9%)
  - Greene (25.8%)
  - Marion (13.6%)
  - Washington (10.9%)
  - Wayne (6.2%)

Employment

(table 10)

- Production employees reported = 140
- Nonproduction employees reported = 117
- Average employee annual wage = $60,862
- Total wages earned = $14,789,347
- Average days worked per operation = 105

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



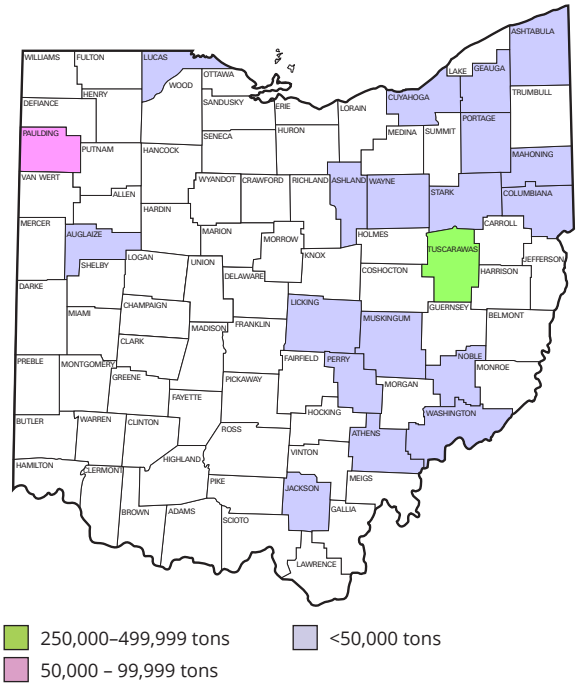


FIGURE 14. Clay sales in Ohio in 2024, by county and quantity.

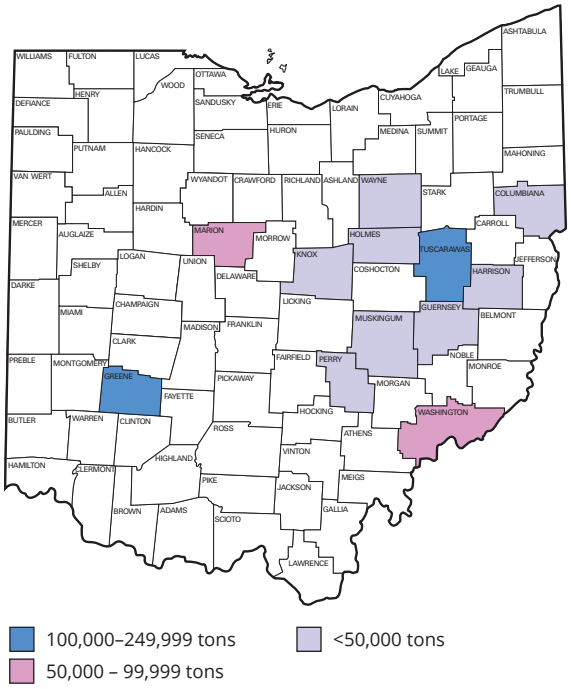


FIGURE 15. Shale sales in Ohio in 2024, by county and quantity.

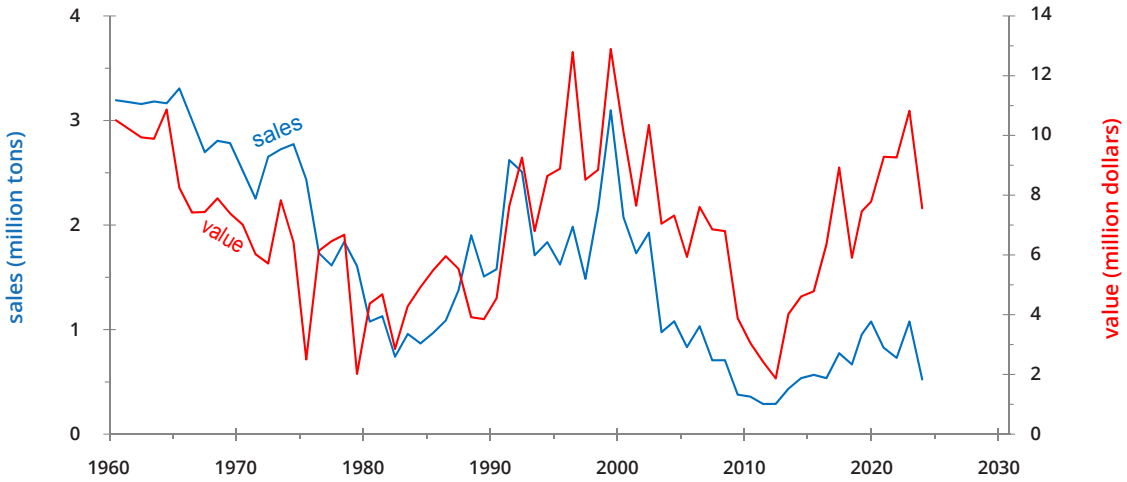


FIGURE 16. Sales and value of clay in Ohio since 1960.

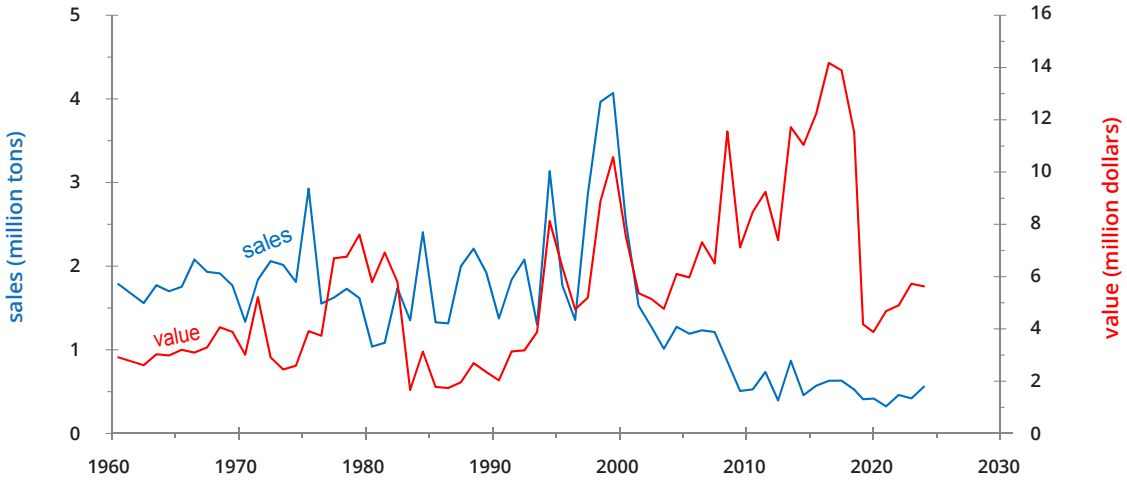


FIGURE 17. Sales and value of shale in Ohio since 1960.

TABLE 16. ***Ohio clay sales in 2024, by county and use***

County	Tons sold								
	Total	Common clay products	Stoneware	Vitrified products	Cement manufacture	Refractories	Construction	Landfill use	Other/ unspecified
Ashland	2,815						2,815		
Ashtabula	8,629								8,629
Athens	45,000							45,000	
Auglaize	1,566	1,566							
Columbiana	3,995	3,995							
Cuyahoga	288	56							232
Geauga	6,095								6,095
Jackson	28,345	24,701				3,644			
Licking	41,617	29,968					11,649		
Lucas	1,787						1,787		
Mahoning	25,356	4,000							21,356
Muskingum	4,190	4,190							
Noble	1,023						1,023		
Paulding	73,532				73,532				
Perry	6,047	6,047							
Portage	16,799	91					16,508		200
Stark	521	521							
Tuscarawas	259,683	252,399			7,284				
Washington	684						684		
Wayne	169						169		
TOTAL	528,141	327,534	0	0	80,816	3,644	34,635	45,000	36,512

TABLE 17. ***Ohio shale sales in 2024, by county and use***

County	Tons sold							
	Total	Common clay products	Vitrified products	Cement manufacture	Lightweight aggregate	Construction	Landfill use	Other/ unspecified
Columbiana	13,912	13,912						
Greene	141,692			141,692				
Guernsey	391							391
Harrison	27,474	27,474						
Holmes	24,751				21,414	240		3,097
Knox	1,305							1,305
Marion	74,861	74,861						
Muskingum	9,728	9,728						
Perry	18,832	18,832						
Tuscarawas	142,085	142,085						
Washington	60,000	60,000						
Wayne	34,161				21,380	12,767		14
TOTAL	549,192	346,892	0	141,692	42,794	13,007	0	4,807

SALT

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 highest-producing area for early salt production was in Meigs County, beginning in 1850. By 1903, Ohio was producing 14.7% 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 in 1957.

The primary use for Ohio salt in 2024 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.

In 2024, despite the 3.6% increase in value, salt production and sales decreased when compared to 2023 data. The recent stretch of warmer winters with lower-than-average precipitation have resulted in municipalities not needing to replenish salt supplies every year, resulting in fluctuating cycles of production, sales, and value.

Production

- Tons produced = 4,180,540 (–11.3% from 2023)
- U.S. ranking:
  - In the top 7 of 16 producing states (**USGS, 2024f**)
- Top producing geologic units (fig. 7):
  - Salina Group (Silurian)

Sales

(figs. 18 and 19)

- Tons sold = 4,239,773 (–0.7% from 2023)
- Value[9] = $243,602,049 (table 9)

Employment

(table 10)

- Production employees reported = 265
- Nonproduction employees reported = 155
- Average employee annual wage = $83,874
- Total wages earned = $35,143,262
- Average days worked per operation = 265

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

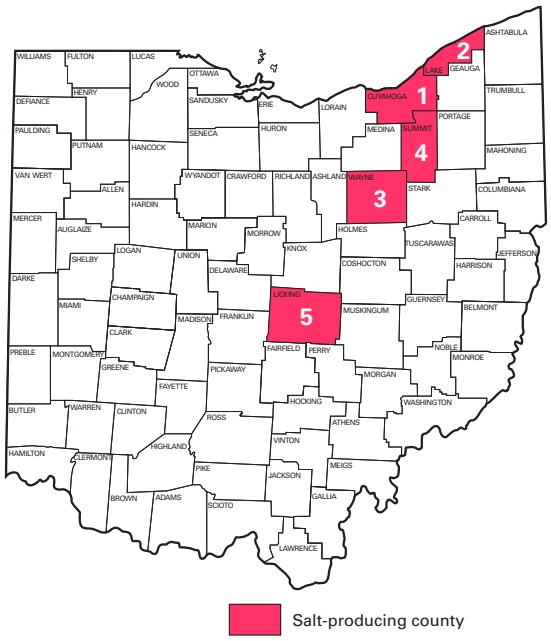


FIGURE 18. Counties producing salt in Ohio in 2024 and their rankings in sales.

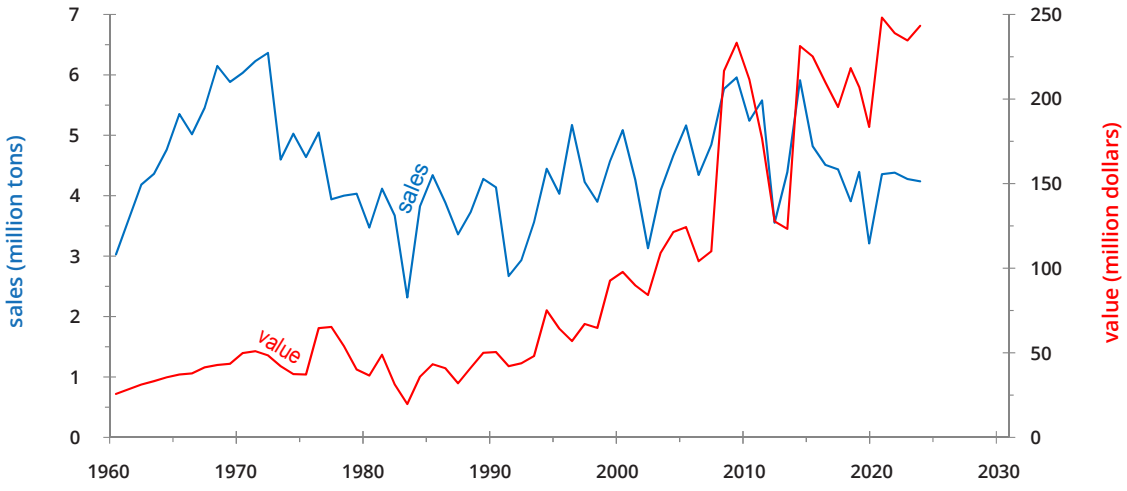


Figure 19. Sales and value of salt in Ohio since 1960.

REFERENCES CITED

Bownocker, J.A., 1906, Salt deposits and the salt industry in Ohio: Columbus, Geological Survey of Ohio, Fourth Series, Bulletin 8, 42 p.

Bownocker, J.A., 1915, Building stones of Ohio: Columbus, Geological Survey of Ohio, Fourth Series, Bulletin 18, 160 p.

Brant, R.A., and Delong, R.M., 1960, Coal resources of Ohio: Columbus, Ohio Department of Natural Resources, Division of Geological Survey Bulletin 58, p. 25–28.

Collins, H.R., 1979, The Mississippian and Pennsylvanian (Carboniferous) Systems in the United States — Ohio: U.S. Geological Survey Professional Paper 1110-E, 26 p.

Crowell, D.L., 1995, History of the coal-mining industry in Ohio: Columbus, Ohio Department of Natural Resources, Division of Geological Survey Bulletin 72, 204 p.

Lamborn, R.E., 1951, Limestones of eastern Ohio: Columbus, Geological Survey of Ohio, Fourth Series, Bulletin 49, 377 p.

Lamborn, R.E., Austin, C.R., and Schaaf, Downs, 1938, Shales and surface clays of Ohio: Columbus, Geological Survey of Ohio, Fourth Series, Bulletin 39, 281 p.

Larsen, G.E., 1991, Historical development and problems within the Pennsylvanian nomenclature of Ohio: Ohio Journal of Science, v. 91, no. 1, p. 69–76.

ODNR Division of Geological Survey, 1959, A century and a half of Ohio minerals: Columbus, Ohio Department of Natural Resources, Division of Geological Survey Information Circular 24, 61 p.

ODNR Division of Geological Survey, 1990, Generalized column of bedrock units in Ohio: Columbus, Ohio Department of Natural Resources, Division of Geological Survey, 1 sheet. [Revised 2000, 2004.]

Slucher, E.R., Swinford, E.M., Larsen, G.E., Schumacher, G.A., Shrake, D.L., Rice, C.L., Caudill, M.R., and Rea, R.G., 2006, Bedrock geologic map of Ohio: Columbus, Ohio Department of Natural Resources, Division of Geological Survey Map BG-1, version 6.0, scale 1:500,000.

Stout, Wilber, 1941, Dolomites and limestones of western Ohio: Columbus, Geological Survey of Ohio, Fourth Series, Bulletin 42, 468 p.

Stout, Wilber, Stull, R.T., McCaughey, W.J., and Demorest, D.J., 1923, The coal formation clays of Ohio: Columbus, Geological Survey of Ohio, Fourth Series, Bulletin 26, 588 p.

U.S. Department of Energy (USDOE), 2024, Monthly Coal Production Estimates, January–December 2024: U.S. Department of Energy, Energy Information Administration, last accessed September 2, 2025, at <https://www.eia.gov/coal/production/weekly/current_year/monthprod2024tot.xlsx>.

U.S. Geological Survey (USGS), 2024a, Crushed Stone: U.S. Geological Survey, Mineral Commodity Summaries, p. 166–167, last accessed July 21, 2025, at <https://pubs.usgs.gov/periodicals/mcs2025/mcs2025-stone-crushed.pdf>.

U.S. Geological Survey (USGS), 2024b, Lime: U.S. Geological Survey, Mineral Commodity Summaries, p. 108–109, last accessed July 21, 2025, at <https://pubs.usgs.gov/periodicals/mcs2025/mcs2025-lime.pdf>.

U.S. Geological Survey (USGS), 2024c, Sand and Gravel: U.S. Geological Survey, Mineral Commodity Summaries, p. 152–153, last accessed July 21, 2025, at <https://pubs.usgs.gov/periodicals/mcs2025/mcs2025-sand-gravel.pdf>.

U.S. Geological Survey (USGS), 2024d, Dimension Stone: U.S. Geological Survey, Mineral Commodity Summaries, p. 168–169, last accessed July 21, 2025, at <https://pubs.usgs.gov/periodicals/mcs2025/mcs2025-stone-dimension.pdf>.

U.S. Geological Survey (USGS), 2024e, Clays: U.S. Geological Survey, Mineral Commodity Summaries, p. 60–61, last accessed July 21, 2025, at <https://pubs.usgs.gov/periodicals/mcs2025/mcs2025-clays.pdf>.

U.S. Geological Survey (USGS), 2024f, Salt: U.S. Geological Survey, Mineral Commodity Summaries, p. 150–151, last accessed July 21, 2025, at <https://pubs.usgs.gov/periodicals/mcs2025/mcs2025-salt.pdf>.

Wright, C.E., compiler, 2024, 2023 Report on Ohio mineral industries—An annual summary of the state's economic geology: Columbus, Ohio Department of Natural Resources, Division of Geological Survey, 22 p.

This page intentionally left blank

OHIO GEOLOGICAL SURVEY
DEPARTMENT OF NATURAL RESOURCES

geo.survey@dnr.ohio.gov
(614) 265-6576
geology.ohiodnr.gov

STATE OF OHIO
Mike DeWine, Governor
DEPARTMENT OF NATURAL RESOURCES
Mary Mertz, Director
DIVISION OF GEOLOGICAL SURVEY
D. Mark Jones, Chief

Map IM-1 2024 Edition
11/2025

MAP OF ACTIVE MINERAL INDUSTRY OPERATIONS IN OHIO 2024

by
Christopher E. Wright

GIS Database Administration by Joseph G. Wells
GIS Cartography by Jason Piwarski

ABOUT THE MAP

This map is based on operators included in the supplementary appendices of the *2024 Report on Ohio Mineral Industries* (Wright, 2025) 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 *2024 Report on Ohio Mineral Industries*. More information about specific operations may be found using the state mine number to refer to the table included on this map or in the directories of operators reporting production, sales, and value in the report appendices. An interactive map of mineral industries and operator information can be viewed online. More information is available on the ODNR Division of Geological Survey website (geology.ohiodnr.gov).

2024 OHIO ECONOMIC GEOLOGY IN BRIEF

In 2024, the total value[1] of coal was $84,155,964 and the total value[1] of all industrial minerals was $1,692,070,076 (table 1); their combined value is equivalent to $1,776,226,040 or approximately $150 per capita. The total value of nonfuel industrial minerals exceeded $1 billion for the eleventh straight year. The total production of coal was 1,886,699 tons (fig. 1A); the total industrial mineral production was 109,676,232 tons (fig. 1A). The combined coal and industrial minerals production in Ohio during 2024 was 111,562,931 tons or approximately 9.4% more than 2023; which is down 1.4% from 2023 production. In 2024, Ohio produced 36,651,332 barrels of oil (fig. 1B), which is up 22.2% from 2023 production; also in 2024, Ohio produced 2,154,297,620 thousand cubic feet of natural gas production (fig. 1B), which is down 2.2% from 2023.

Reported and estimated total direct employment in the extractive industries of Ohio in 2024 totaled over 10,000 people. Industrial mineral production increased for shale, as well as sand and gravel, while production decreased for limestone and dolomite, salt, coal, sandstone and conglomerate, clay, and peat. In 2024, the production-leading commodity of limestone and dolomite was down 0.5% from 2023, with the second-leading commodity of sand and gravel up 0.1% from 2023; the third-leading commodity of salt was down 11.3% from 2023; the fourth-leading commodity of coal was down 9.7% from 2023.

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

REFERENCES CITED

Wright, C.E., compiler, 2025, 2024 Report on Ohio mineral industries–An annual summary of the state's economic geology: Columbus, Ohio Department of Natural Resources, Division of Geological Survey, 22 p.

TABLE 1. *Fuel and nonfuel mineral sales and production in Ohio in 2024*

Commodity	Production[2]	Sales[3]	Value[3]	Change in value from 2023 (percent)[4]
Limestone and dolomite	73,019,943 tons	70,374,064 tons	$1,050,019,848	+5.1
Coal	1,886,699 tons	1,879,283 tons	$84,155,964	-13.6
Sand and gravel	30,050,959 tons	29,457,762 tons	$329,498,238	+7.1
Salt	4,180,540 tons	4,239,773 tons	$243,602,045	+3.8
Sandstone and conglomerate	1,368,564 tons	1,465,075 tons	$55,856,834	-2.7
Shale	535,352 tons	549,192 tons	$3,620,178	+1.9
Clay	520,874 tons	528,141 tons	$7,472,929	-30.9
Peat	0 tons	0 tons	0	-100.0
Gas	2,154,297,620 thousand cubic feet	not available	not available	not available
Oil	36,651,332 barrels	not available	not available	not available

[2]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 estimated equal to sales or estimated from ODNR Division of Mineral Resources Management records.
Includes material from stockpile use.
[3]The FOB value (free on board; value of mined product excluding insurance or transportation costs) of industrial minerals sold was estimated for mines that failed to report this information and for those graphics, (c) material for captive use. These estimates were calculated using a statewide-average price per ton based on reported FOB values.
[4]Percent change in value for peat is based on production in 2023, when peat was last mined in Ohio.

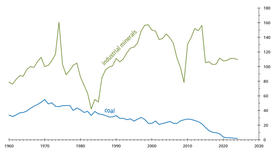


FIGURE 1. (A) Production of coal and industrial minerals in Ohio since 1960. (B) Production of oil and gas in Ohio since 1960.


MICHIGAN
INDIANA
KENTUCKY
WEST VIRGINIA
PENNSYLVANIA
CANADA
U.S.
LAKE ERIE
W. SISTER I.
NORTH BASS I.
MIDDLE BASS I.
SOUTH BASS I.
KELLEYS I.
Toledo
Cleveland
Akron
Youngstown
Canton
Cincinnati
Columbus
Dayton
Lake-6
Gea-1
Lke-K
Asa-SY
Asa-18
Asa-27
Asa-25
Gea-3
Gea-29
Gea-9
Gea-TK
Cya-42
Cya-30
Gy-309
Gy-R
Ne-BN10
Ne-BN8
Ne-BN9
Ne-BN5
Ne-BN
Ne-S
Ne-K1
Ne-PA
Ne-PB
Ne-OB
Ne-OB1
Ne-50
Ne-40
Ne-39
Ne-15
Ne-14
Ne-9
Ne-BA
Ne-La
Mg-62
Mg-Y
Mg-632
Ca-SM
Mg-EF
Mg-EF1
Mg-54
Mg-L
Ca-XL
Ca-SU
Ca-994
Ca-CA1
Ca-681
Ca-205
Ca-P1
Ts-1036
Ts-MA
Ts-HC
Ts-HC1
Ts-2001
Ts-S2
Ts-S1
Ts-1884
Ts-125
Ts-69
Ts-11
Ts-8
Ts-1960
Ts-1826
Ts-1841
Ts-1660
Ts-1646
Ts-1939
Ts-1517
Ts-K17
Ts-K18
Ts-1818
Hn-K
Hn-152
Hn-A1
Hn-169
Hn-H
Hn-R1
Br-E
Bt-1203
Bt-1204
Br-N
Wn-1011
Wn-SM
Wn-508
Wn-B
Wn-54
Wn-SS
Wn-11
Wn-Y
Wn-E
Wn-E1
Wn-E2
Wn-E3
Wn-E4
Wn-EA
Wn-25
Wn-827
Wn-S1
Wn-S2
Wn-S3
Wn-S4
Wn-S5
Wn-S6
Wn-S7
Wn-S8
Wn-S9
Wn-S10
Wn-S11
Wn-S12
Wn-S13
Wn-S14
Wn-S15
Wn-S16
Wn-S17
Wn-S18
Wn-S19
Wn-S20
Wn-S21
Wn-S22
Wn-S23
Wn-S24
Wn-S25
Wn-S26
Wn-S27
Wn-S28
Wn-S29
Wn-S30
Wn-S31
Wn-S32
Wn-S33
Wn-S34
Wn-S35
Wn-S36
Wn-S37
Wn-S38
Wn-S39
Wn-S40