

OHIO SHALE REPORT

A map of Ohio showing its 88 counties. Fifteen counties are highlighted in orange, representing shale regions. These counties are: Ashtabula, Geauga, Trumbull, Portage, Mahoning, Columbiana, Stark, Wayne, Ashland, Medina, Summit, Cuyahoga, Lorain, Huron, Erie, Sandusky, Seneca, Hancock, Putnam, Van Wert, Allen, Mercer, Auglaize, Hardin, Wyandot, Crawford, Richland, Morrow, Knox, Holmes, Tuscarawas, Carroll, Jefferson, Harrison, Belmont, Guernsey, Noble, Monroe, Washington, Morgan, Perry, Fairfield, Licking, Delaware, Union, Logan, Champaign, Clark, Madison, Franklin, Pickaway, Fayette, Ross, Pike, Adams, Scioto, Jackson, Meigs, Gallia, Lawrence, Vinton, Hocking, Athens, and Meigs. The highlighted counties are primarily located in the eastern and central parts of the state.

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A Message from Director Dungey

Shale oil and gas drilling brought significant opportunities for Ohio workers in 2014. Employment in core shale-related industries grew almost 25 percent from 2013, and total wages for the industry grew almost 32 percent. The number of core shale-related businesses increased by more than 8 percent, and the number of shale-related online job postings rose more than 18 percent.

For the most part, these jobs have few entry-level requirements and above-average salaries. Of the 38 key shale-related occupations, 20 require only a high school diploma or less and up to a year of on-the-job training. Others require work experience and postsecondary education – and Ohio’s four-year and community colleges stand ready to fill that need, as well. Opportunities exist in everything from trucking to industrial engineering, from customer service to environmental science. Median wages for these jobs range from \$23,000 to more than \$74,000 a year.

This is very good news for Ohioans, Ohio’s communities and the state as a whole. Ohio is fortunate to have this resource that can help us continue our steady recovery from the national recession.

In partnership with the U.S. Department of Labor’s Bureau of Labor Statistics, the Ohio Department of Job and Family Services’ Bureau of Labor Market Information collects and analyzes shale-related employment data for Ohio. The pages that follow provide a synopsis of this information for 2014. For more frequent reports, see *Ohio Shale: Quarterly Economic Trends for Ohio Oil and Gas Industries*. Both the quarterly and annual reports can be found at ohiolmi.com.

A handwritten signature in black ink that reads "Cynthia C. Dungey". The script is fluid and cursive.

Cynthia C. Dungey, Director
Ohio Department of Job and Family Services

Introduction

Ohio Revised Code section 6301.12 calls for the publication of an annual report assessing the direct and indirect economic impact of businesses engaged in the production of horizontal wells. This report fulfills that requirement by presenting available economic data on businesses engaged in the production of oil and gas wells in Ohio. This report focuses on employment in core and ancillary shale industries. It does not encompass all economic activity related to Ohio's shale industry. For example, increased business and employment at restaurants and retail stores located near shale development is not reflected in this report. Much of the information in this report reflects data for a group of five industries defined as "core" shale-related industries and a group of 30 industries defined as "ancillary" shale-related industries. While the vast majority of shale-related employment can be found in these industries, not all business establishments in these industries are involved in shale-related activity. For those that are, not all of their products and services and, therefore, their employment are necessarily linked to shale-related economic activity. This is particularly true for the ancillary industries.

This report shows annual employment and business establishment changes in core and ancillary shale-related industries from 2013 to 2014. These data include government employment (federal, state and local) in all shale-related industries because significant non-private employment is present in a number of these industries, most notably: highway, street and bridge construction; engineering services; water supply and irrigation systems; and sewage treatment facilities. This report also shows worker demand, key occupations in shale-related industries, residency status of new hires in core and ancillary industries, and average wages, and it offers a summary of regional workforce development plans. The final section summarizes the impact of these factors.

Core Shale-Related Industry Employment

Employment in core shale-related industries grew significantly from 2013 to 2014. Overall employment in the core industries grew 24.8 percent, an increase of 2,752 jobs. Support activities for oil and gas operations had the largest numeric increase, with 1,241 jobs added; the drilling oil and gas wells industry had the largest percentage increase, 67.1 percent, from 2013 to 2014. See Figure 1 for details about employment growth in the core shale-related industries.

Figure 1. Core Shale-Related Industry Annual Employment Averages and Year-to-Year Change

NAICS	Title	Average Employment, 2013	Average Employment, 2014	Numeric Change	Percent Change
211111	Crude Petroleum and Natural Gas Extraction	1,694	1,875	181	10.7%
211112	Natural Gas Liquid Extraction	307	449	142	46.3%
213111	Drilling Oil and Gas Wells	1,023	1,709	686	67.1%
213112	Support Activities for Oil and Gas Operations	2,520	3,761	1,241	49.2%
237120	Oil and Gas Pipeline Construction	5,253	5,724	471	9.0%
486210	Pipeline Transportation of Natural Gas	314	345	31	9.9%
Core Industries Totals		11,111	13,863	2,752	24.8%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Business Establishments in Core Industries

The number of Ohio business establishments in the core shale-related industries grew by 60 from 2013 to 2014, an 8.2 percent increase. The growth in core industry establishments was led by support activities for oil and gas operations, which added 35 establishments. See Figure 2 for details about establishment growth in the core shale-related industries.

Figure 2. Core Shale-Related Industry Annual Establishment Averages and Year-to-Year Change

NAICS	Title	Average Establishments, 2013	Average Establishments, 2014	Numeric Change	Percent Change
211111	Crude Petroleum and Natural Gas Extraction	208	203	-5	-2.4%
211112	Natural Gas Liquid Extraction	17	18	1	5.9%
213111	Drilling Oil and Gas Wells	95	103	8	8.4%
213112	Support Activities for Oil and Gas Operations	238	273	35	14.7%
237120	Oil and Gas Pipeline Construction	135	153	18	13.3%
486210	Pipeline Transportation of Natural Gas	38	41	3	7.9%
Core Industries Totals		731	791	60	8.2%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Ancillary Shale-Related Industry Employment

Ancillary shale-related industries are indirectly involved with shale oil and gas well drilling and development. These industries provide products or support services to the core shale-related industries and many other industries as well. Employment in ancillary shale-related industries grew by 2.8 percent from 2013 to 2014, an increase of 4,702 jobs. Industrial supplies merchant wholesalers saw the largest increase, with 806 jobs added over the year; oil and gas field machinery and equipment manufacturing had the largest percentage growth at 19.9 percent. Fossil fuel electric power generation lost 307 jobs, the largest loss. See Figure 3 for details about employment growth in the 30 ancillary shale-related industries.

Figure 3. Ancillary Shale-Related Industry Annual Employment Averages and Year-to-Year Change

NAICS	Title	Average Employment, 2013	Average Employment, 2014	Numeric Change	Percent Change
221112	Fossil fuel electric power generation	4,049	3,742	-307	-7.6%
221210	Natural gas distribution	4,064	4,021	-43	-1.1%
221310	Water supply and irrigation systems	5,943	6,008	65	1.1%
221320	Sewage treatment facilities	3,856	3,813	-43	-1.1%
237110	Water and sewer line system construction	4,837	5,284	447	9.2%
237310	Highway, street, and bridge construction	15,439	15,600	161	1.0%
238912	Nonresidential site preparation contractors	5,296	5,995	699	13.2%
325110	Petrochemical manufacturing	324	328	4	1.2%
325120	Industrial gas manufacturing	754	742	-12	-1.6%
331110	Iron, steel mills and ferroalloy manufacturing	9,240	8,937	-303	-3.3%
331210	Iron, steel pipe and tube from purchased steel	2,714	2,955	241	8.9%
333131	Mining machinery and equipment manufacturing	473	454	-19	-4.0%
333132	Oil and gas field machinery and equipment	357	428	71	19.9%
423810	Construction equipment merchant wholesalers	3,258	3,416	158	4.8%
423830	Industrial machinery merchant wholesalers	16,353	16,860	507	3.1%
423840	Industrial supplies merchant wholesalers	4,745	5,551	806	17.0%
484110	General freight trucking, local	12,538	12,393	-145	-1.2%
484220	Other specialized trucking, local	7,429	8,220	791	10.6%
484230	Other specialized trucking, long-distance	5,402	5,719	317	5.9%
531190	Lessors of other real estate property	906	934	28	3.1%
532412	Other heavy machinery rental and leasing	1,961	2,160	199	10.1%
541330	Engineering services	26,007	26,682	675	2.6%
541360	Geophysical surveying and mapping services	332	315	-17	-5.1%
541380	Testing laboratories	6,059	6,227	168	2.8%
541620	Environmental consulting services	1,743	1,824	81	4.6%
562910	Remediation services	3,780	3,610	-170	-4.5%
811310	Commercial machinery repair and maintenance	7,626	7,837	211	2.8%
924110	Air, water, and waste program administration	6,110	6,108	-2	0.0%
924120	Administration of conservation programs	5,599	5,731	132	2.4%
926130	Utility regulation and administration	113	115	2	1.8%
Ancillary Industry Totals		167,307	172,009	4,702	2.8%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Business Establishments in Ancillary Industries

The number of business establishments in ancillary shale-related industries increased by 45 from 2013 to 2014, a 0.4 percent increase. Engineering services led with an increase of 36 establishments, and local general freight trucking had the largest decrease, with a loss of 20 establishments. See Figure 4 for details.

Figure 4. Ancillary Shale-Related Industry Annual Establishment Averages and Year-to-Year Change

NAICS	Title	Average Establishments, 2013	Average Establishments, 2014	Numeric Change	Percent Change
221112	Fossil fuel electric power generation	62	60	-2	-3.2%
221210	Natural gas distribution	145	146	1	0.7%
221310	Water supply and irrigation systems	256	263	7	2.7%
221320	Sewage treatment facilities	22	23	1	4.5%
237110	Water and sewer line system construction	363	366	3	0.8%
237310	Highway, street, and bridge construction	412	413	1	0.2%
238912	Nonresidential site preparation contractors	594	602	8	1.3%
325110	Petrochemical manufacturing	5	5	0	0.0%
325120	Industrial gas manufacturing	42	43	1	2.4%
331110	Iron, steel mills and ferroalloy manufacturing	60	57	-3	-5.0%
331210	Iron, steel pipe and tube from purchased steel	38	37	-1	-2.6%
333131	Mining machinery and equipment manufacturing	12	13	1	8.3%
333132	Oil and gas field machinery and equipment	11	12	1	9.1%
423810	Construction equipment merchant wholesalers	191	196	5	2.6%
423830	Industrial machinery merchant wholesalers	1,624	1,607	-17	-1.0%
423840	Industrial supplies merchant wholesalers	486	486	0	0.0%
484110	General freight trucking, local	1,370	1,350	-20	-1.5%
484220	Other specialized trucking, local	1,021	1,046	25	2.4%
484230	Other specialized trucking, long-distance	312	327	15	4.8%
531190	Lessors of other real estate property	275	280	5	1.8%
532412	Other heavy machinery rental and leasing	187	192	5	2.7%
541330	Engineering services	2,342	2,378	36	1.5%
541360	Geophysical surveying and mapping services	53	57	4	7.5%
541380	Testing laboratories	369	375	6	1.6%
541620	Environmental consulting services	314	318	4	1.3%
562910	Remediation services	204	187	-17	-8.3%
811310	Commercial machinery repair and maintenance	1,075	1,056	-19	-1.8%
924110	Air, water, and waste program administration	158	155	-3	-1.9%
924120	Administration of conservation programs	274	271	-3	-1.1%
926130	Utility regulation and administration	30	31	1	3.3%
Ancillary Industry Totals		12,307	12,352	45	0.4%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Demand for Workers in Shale-Related Occupations

Figures 5 and 6 show the number of online job ads by quarter for the core and ancillary shale-related industries during 2013 and 2014. From 2013 to 2014, the number of online ads for jobs in the core shale-related industries increased 23.1 percent in the first quarter and 24.7 percent in the second quarter. The third and fourth quarters saw slight declines, of 4 percent and 12.1 percent, respectively.

Over the same period, the number of online ads for jobs in ancillary shale-related industries increased. The first and fourth quarters saw the largest increases in online ads, at 14.7 percent and 12.5 percent, respectively.

These data are from the Help-Wanted OnLine® data series; they are an indicator of occupational demand. The series does not include all online job ads, nor does it include jobs not advertised online.

Figure 5. Help Wanted OnLine® Job Ads
for Core Shale-Related Industries

Quarter	2013	2014	Numeric Change	Percent Change
Q1	108	133	25	23.1%
Q2	93	116	23	24.7%
Q3	99	95	-4	-4.0%
Q4	91	80	-11	-12.1%

Source: The Conference Board, Help Wanted OnLine® data series

Figure 6. Help Wanted OnLine® Job Ads
for Ancillary Shale-Related Industries

Quarter	2013	2014	Numeric Change	Percent Change
Q1	2,981	3,420	439	14.7%
Q2	3,099	3,407	308	9.9%
Q3	3,082	3,246	164	5.3%
Q4	2,659	2,992	333	12.5%

Source: The Conference Board, Help Wanted OnLine® data series

Key Shale-Related Occupations

The occupations listed in this report are not exclusive to any particular industry, but they have a high presence in shale-related industries. Figure 7 shows key occupations in core and ancillary shale-related industries. These occupations are likely to provide family-sustaining wages and tend to require higher skill sets. Twenty-eight of the 38 occupations listed have median annual wages above the state annual median wage of \$34,250.

Figure 7. Key Occupations in Shale-Related Industries

SOC Code	SOC Title	Median Annual Wage	Typical Education, Work Experience, On-the-Job Training (OJT) Needed
53-7062	Laborers and Freight Stock and Material Movers Hand	\$23,129	Less than HS, Short-term OJT
43-9061	Office Clerks General	\$28,292	HS dipl./GED, Short-term OJT
47-5071	Roustabouts Oil and Gas	\$29,579	Less than HS, Moderate-term OJT
45-4022	Logging Equipment Operators	\$30,364	HS dipl./GED, Moderate-term OJT
47-5012	Rotary Drill Operators Oil and Gas	\$30,670	Less than HS, Moderate-term OJT
43-4051	Customer Service Representatives	\$31,745	HS dipl./GED, Short-term OJT
53-7073	Wellhead Pumpers	\$31,922	Less than HS, Less than 5 yrs Exp, Moderate-term OJT
43-6014	Secretaries Except Legal Medical and Executive	\$32,244	HS dipl./GED, Short-term OJT
51-4122	Welding Soldering and Brazing Machine Setters Operators and Tenders	\$33,168	HS dipl./GED, Moderate-term OJT
43-3021	Billing and Posting Clerks and Machine Operators	\$33,497	HS dipl./GED, Short-term OJT
47-5011	Derrick Operators Oil and Gas	\$34,361	Less than HS, Short-term OJT
51-9061	Inspectors Testers Sorters Samplers and Weighers	\$35,269	HS dipl./GED, Moderate-term OJT
43-3031	Bookkeeping Accounting and Auditing Clerks	\$35,778	HS dipl./GED, Moderate-term OJT
51-4121	Welders Cutters Solderers and Brazers	\$36,034	HS dipl./GED, Moderate-term OJT
47-2061	Construction Laborers	\$37,236	Less than HS, Short-term OJT
53-3032	Truck Drivers Heavy and Tractor-Trailer	\$38,655	HS dipl./GED, Short-term OJT
43-5061	Production Planning and Expediting Clerks	\$41,135	HS dipl./GED, Moderate-term OJT
49-9052	Telecommunications Line Installers and Repairers	\$41,341	HS dipl./GED, Long-term OJT
47-5013	Service Unit Operators Oil Gas and Mining	\$43,364	Less than HS, Moderate-term OJT
49-3042	Mobile Heavy Equipment Mechanics Except Engines	\$44,724	HS dipl./GED, Long-term OJT
47-2073	Operating Engineers and Other Construction Equipment Operators	\$45,383	HS dipl./GED, Moderate-term OJT
53-7072	Pump Operators Except Wellhead Pumpers	\$45,992	Less than HS, Moderate-term OJT
49-9041	Industrial Machinery Mechanics	\$46,584	HS dipl./GED, Long-term OJT
47-2152	Plumbers Pipefitters and Steamfitters	\$49,951	HS dipl./GED, Apprenticeship
53-1031	First-Line Supervisors/Managers of Trans.and Material-Moving Machine and Vehicle Operators	\$52,203	HS dipl./GED, Less than 5 yrs Exp
17-3025	Environmental Engineering Technicians	\$52,448	Associate's Deg.
19-4041	Geological and Petroleum Technicians	\$53,029	Associate's Deg., Moderate-term OJT
51-1011	First-Line Supervisors/Managers of Production and Operating Workers	\$53,994	Post-HS non-Deg. award, Less than 5 yrs
13-1051	Cost Estimators	\$56,249	Bachelor's Deg.
17-3023	Electrical and Electronic Engineering Technicians	\$57,296	Associate's Deg.
17-2151	Mining and Geological Engineers Including Mining Safety	\$57,795	Bachelor's Deg.
49-1011	First-Line Supervisors/Managers of Mechanics Installers and Repairers	\$59,022	HS dipl./GED, Less than 5 yrs Exp
47-1011	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	\$59,902	HS dipl./GED, More than 5 yrs Exp
49-9051	Electrical Power-Line Installers and Repairers	\$64,225	HS dipl./GED, Long-term OJT
53-7071	Gas Compressor and Gas Pumping Station Operators	\$68,384	Less than HS, Moderate-term OJT
41-4011	Sales Representatives Wholesale and Manufacturing Technical and Scientific Products	\$68,686	Bachelor's Deg., Moderate-term OJT
19-2042	Geoscientists Except Hydrologists and Geographers	\$72,755	Bachelor's Deg.
17-2112	Industrial Engineers	\$74,649	Bachelor's Deg.

Source: Ohio Bureau of Labor Market Information, Occupational Employment Statistics, June 2014

From 2013 to 2014, the estimated number of construction trades jobs in core oil and gas industries in Ohio increased by 18.3 percent, from 3,507 to 4,150. More than three-quarters of the increase was in support activities for oil and gas operations and oil and gas pipeline construction. The number of extraction trade jobs increased by 44.4 percent, from 1,449 to 2,092. Most of that increase was in support activities for oil and gas operations. See Figure 8.

Figure 8. Estimated Number of Construction and Extraction Jobs in the Core Shale-Related Industries

NAICS	Title	2013		2014		2013-2014 Numeric Change	
		Construction Trades	Extraction Trades	Construction Trades	Extraction Trades	Construction Trades	Extraction Trades
211111	Crude Petroleum and Natural Gas Extraction	44	147	49	163	5	16
211112	Natural Gas Liquid Extraction	8	27	12	39	4	12
213111	Drilling Oil and Gas Wells	207	318	345	531	139	213
213112	Support Activities for Oil and Gas Operations	509	784	760	1,170	251	386
237120	Oil and Gas Pipeline Construction	2,726	173	2,971	189	244	16
486210	Pipeline Transportation of Natural Gas	13	0	14	0	1	0
Core Industries Totals		3,507	1,449	4,150	2,092	643	643

Source: Ohio Bureau of Labor Market Information analysis

Shale-Related Industries' Worker State of Residence

Although data are not available on the state of residence for all workers, limited information is available from the State Directory of New Hires. This database was developed to help collect child support. State law requires all Ohio employers to report all independent contractors and newly hired and rehired employees to the directory within 20 days of the hire or rehire date.¹ Hiring activities that generate W-4 tax forms are included in the data.

On average in 2014, core-industry employers reported 1,097 new hires from Ohio and 713 new hires from other states each quarter. This was an 18.9 percent increase over 2013 numbers and an 11.8 percent increase for out-of-state new hires. Ohioans accounted for 60.6 percent of new hires in the core industries; this was up slightly from 59.1 percent in 2013. See Figure 9 for details.

Ancillary shale-related industry employers reported an average of 9,677 Ohio new hires and 8,391 out-of-state new hires each quarter during 2014. This was a 1.9 percent increase over 2013 for Ohio new hires and a 3.3 percent increase for out-of-state new hires. In 2014, 53.6 percent of new hires in ancillary shale-related industries were from Ohio; this was down slightly from 53.9 percent in 2013. See Figure 10 for details.

¹ Ohio Revised Code Section 3121.89-3121.8911 and the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996, 42 U.S.C. 653a.

Figure 9. 2013 and 2014 Average Quarterly
New Hires in the Core Shale-Related Industries

State of Residence	2013	2014	Numeric Change	Percent Change
Ohio	922	1,097	175	18.9%
Total Out-of-State	638	713	75	11.8%
Indiana	12	12	0	2.1%
Kentucky	22	31	9	39.3%
Michigan	12	15	3	27.7%
Pennsylvania	102	110	8	7.6%
West Virginia	144	148	4	2.8%
All Other States	346	398	52	15.0%

Source: Ohio Directory of New Hires

Figure 10. 2013 and 2014 Average Quarterly
New Hires in the Ancillary Shale-Related Industries

State of Residence	2013	2014	Numeric Change	Percent Change
Ohio	9,498	9,677	179	1.9%
Total Out-of-State	8,123	8,391	268	3.3%
Indiana	539	533	-6	-1.1%
Kentucky	433	386	-47	-10.8%
Michigan	472	468	-4	-0.8%
Pennsylvania	527	543	17	3.1%
West Virginia	264	279	16	5.9%
All Other States	5,890	6,182	292	5.0%

Source: Ohio Directory of New Hires

Total Wage Growth in the Core Shale-Related Industries

Total wages in the core shale-related industries grew 31.8 percent from 2013 to 2014, or more than \$248 million. Total wage growth in three core industries was significantly above their employment growth. Total wages for the drilling oil and gas well industry increased by 99.8 percent; employment increased 67.1 percent. Total wages for support activities for oil and gas operations increased 75.4 percent; employment increased 49.2 percent. Total wages for crude petroleum and natural gas extraction increased 26.9 percent; employment increased 10.7 percent. See Figure 11 for detailed industry wage growth.

Figure 11. Core Shale-Related Industry Total Wages and Year-to-Year Change

NAICS	Title	Total Wages (thousands), 2013	Total Wages (thousands), 2014	Numeric Change (thousands)	Percent Change
211111	Crude Petroleum and Natural Gas Extraction	\$104,532	\$132,669	\$28,137	26.9%
211112	Natural Gas Liquid Extraction	\$22,553	\$28,295	\$5,742	25.5%
213111	Drilling Oil and Gas Wells	\$61,382	\$122,648	\$61,266	99.8%
213112	Support Activities for Oil and Gas Operations	\$154,445	\$270,878	\$116,433	75.4%
237120	Oil and Gas Pipeline and Related Structures Construction	\$416,262	\$449,959	\$33,697	8.1%
486210	Pipeline Transportation of Natural Gas	\$23,972	\$27,351	\$3,379	14.1%
Core Industries Totals		\$783,146	\$1,031,800	\$248,654	31.8%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Regional Workforce Development Plans

Ohio's workforce investment boards establish local policies for workforce services funded by the federal Workforce Investment Act. They also develop five-year plans to identify target populations, in-demand occupations and employment trends, in order to guide service delivery to support growing industries and successful job placement. The workforce investment boards are required to submit these plans to the Ohio Department of Job and Family Services, which reviews them for viability, especially as it relates to compliance and performance.

Local workforce investment boards are required to submit biannual amendments to their plans, as part of their memorandums of understanding with the state. The amendments reflect planned changes in service delivery to respond to evolving economic and occupational needs. Local areas that identify occupations in shale-related core and ancillary industries as in-demand occupations include that information in their local plans and policies.

Summary

Employment in core shale-related oil and gas industries in Ohio continues to grow although the rate of growth has slowed. From 2013 to 2014, average annual employment increased from 11,111 to 13,863, a 24.8 percent increase. Employment growth among the core industries was led by support activities for oil and gas operations (1,241 jobs, a 49.2 percent increase) and drilling oil and gas wells (686 jobs, a 67.1 percent increase). The number of business establishments in the core industries increased 8.2 percent, from 731 to 791.

Employment growth in the ancillary shale-related industries was slower than for the core industries. From 2013 to 2014, average annual employment increased 2.8 percent, from 167,307 to 172,009 jobs. The number of establishments

increased by 45, or 0.4 percent. It is important to note that ancillary shale-related businesses serve other industries in addition to oil and gas extraction.

Employer demand for occupations in the core shale-related industries, as measured by online job ads, increased in the first half of the year before declining slightly for the second half of the year. For the same period, the number of online jobs ads was higher in 2014 than 2013 for occupations in ancillary shale-related industries. Median annual wages for key occupations in the shale-related industries range from \$23,129 to \$74,649. The estimated number of construction and extraction trade jobs in the core shale-related industries increased 18.3 percent in 2013 and 44.3 percent in 2014.

The number of Ohio residents who were new hires in the core shale-related industries increased 18.9 percent from 2013 to 2014, compared to 11.8 percent for out-of-state new hires. Among the core shale-related industries, 60.6 percent of new hires were Ohio residents in 2014, a slight increase from 2013. Among the ancillary industries, 53.6 percent of new hires were Ohio residents in 2014, a slight decrease from 2013.

Overall, total wages for the core shale-related industries grew by more than \$248 million to almost \$1.03 billion, a 31.8 percent increase over 2013. For three of the five core shale-related industries, total industry wages increased faster than industry employment.

Local workforce investment areas with in-demand shale occupations include that information in their local plans and policies, in order to help individuals become trained in the skills employers need.

John R. Kasich, Governor

State of Ohio
<http://Ohio.gov>

Cynthia C. Dungey, Director

Ohio Department of Job and Family Services
<http://jfs.ohio.gov>

Office of Workforce Development
<http://jfs.ohio.gov/owd/>

Bureau of Labor Market Information
<http://OhioLMI.com>

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