

2011

Ohio Oil and Gas Summary

Division of Oil and Gas Resources Management



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In October 2011, the Oil and Gas Program, formerly under the Division of Mineral Resources Management, became a stand-alone division within the Ohio Department of Natural Resources. Since 1965, staff has effectively regulated oil and gas production in this state.

The division is responsible for regulating the permitting, drilling and production of Ohio's oil and natural gas resources. The division also plugs abandoned oil and gas wells, ensures protection of freshwater resources, and maintains a comprehensive database of Ohio's production wells.

Expertise is provided by a professional staff of geologists, soil scientists and hydrogeologists. Program support services include permitting, hydrology, bonding, field inspection and enforcement, and administration support.

As Ohio celebrates the 150th anniversary of the first oil and gas well drilled in the state, the division is preparing for the future of oil and gas development in Ohio—exploration of the Utica and Marcellus shale formations.

Senate Bill 165, effective in June 2010, significantly updated the state's oil and gas laws. The legislation focused on three areas: updating oil and gas law to improve protection of public health, safety and the environment; improving the state's urban drilling regulations; and providing a stable source of funding for the oil and gas program.

Introduction

This forty-seventh edition of the Ohio Oil & Gas Summary (**The McCormac Report**) remains dedicated to accurately presenting statistics that may reflect trends important to Ohio's oil and gas industry, citizens and other governmental agencies. This report includes data submitted through March 2, 2012.

You may also note that some 2010 statistics have been adjusted to include well completion reports received after last year's cut-off date. The 2010 report estimated 431 wells were drilled; the total number has been revised to 427. There are no major revisions in this year's report.

Highlights include:

- 5,722 registered well owners, including 4,283 domestic owners operating 64,481 wells.
- Issued 1,533 permits, including 690 drilling permits.
- Issued 131 urbanized area permits in 19 counties.
- Drilled an estimated 460 oil and gas wells in 42 of Ohio's 88 counties.
- Knox and Stark counties were the most active with 43 wells drilled.
- Horizontal well drilled to a record-setting length of 14,445 feet in Carroll County.
- 355 wells were plugged, including 15 contracted by the Orphan Well Program.
- Produced 4,852,964 barrels of crude oil, at an average price of \$90.06 per barrel.
- Produced more than 73 billion cubic feet of natural gas, at an average price of \$4.28 per mcf.
- The combined market value of crude oil and natural gas production was \$747,714,808.

To make oil and gas well data more accessible, the division:

- Distributed 242 copies of RBDMS, its oil and gas well database.

Mike McCormac
Manager, Oil and Gas Permitting Program

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Permitting

The division issued 1,533 permits, an increase of 21 (1.4%) from 2010 (Figure 1). This total includes permits issued to convert, deepen, drill, plug back, plug and abandon, reissue and reopen. Permits were issued in 14 days on average, compared to 12 in 2010.

Permits issued to drill for oil and gas totaled 690, a 6% increase (39 permits) from last year. These permits included 588 new permits and 102 re-issued permits. Clinton sandstone permits decreased by 37 for a total of 270 and accounted for 39% of all drill permits. Devonian shale permits decreased by one for a total of 54, including four issued for Marcellus shale, and accounted for 8% of all drill permits. Deep well permits increased by four for a total of 156 and accounted for 23% of all drill permits. Deep well permits are those issued to drill to formations below the Cambro-Ordovician Knox unconformity such as the Beekmantown dolomite, Rose Run sandstone, Trempealeau dolomite and Mt. Simon Sandstone. Berea Sandstone permits decreased by seven for a total of 68 (10% of the total). Utica/Point Pleasant permits increased by 63 for a total of 66 (10% of the total).

Five hundred and seventy-one plugging permits were issued, a decrease of 169 (22.8%) from 2010,

which includes 39 permits for the Orphan Well Program.

Notable permitting highlights for 2011 include:

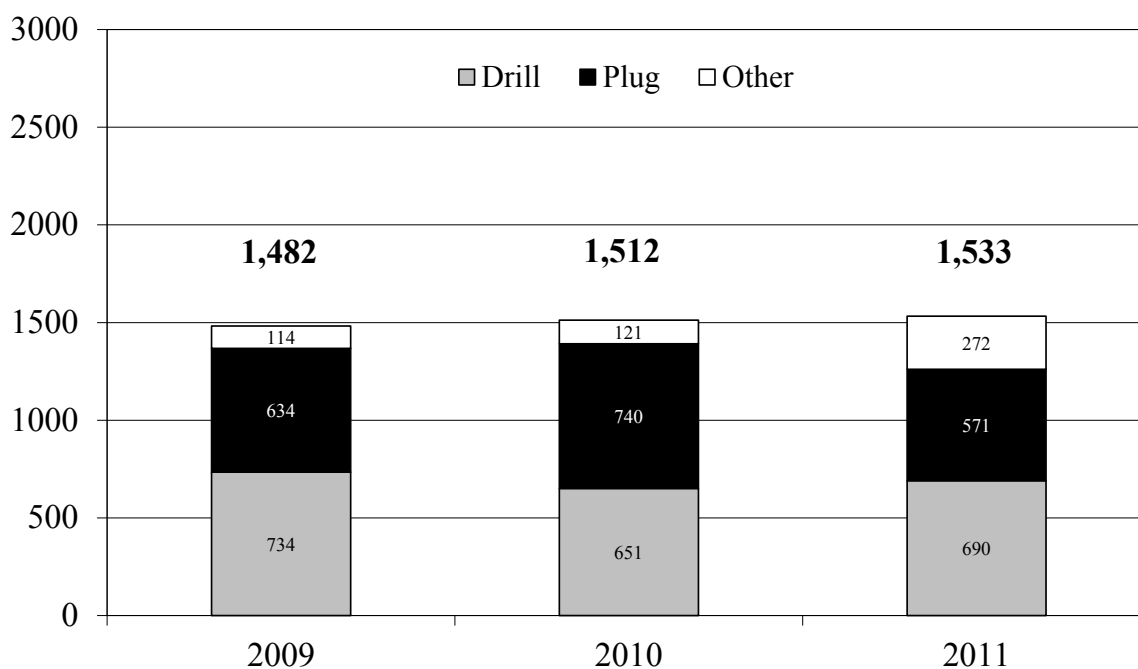
- issued 131 urbanized area permits (a decrease of 51) in 19 counties. The top five counties were Summit (26), Stark (21), Cuyahoga (19), Trumbull (15) and Portage (11);
- reviewed 12 mandatory pooling applications; and
- processed 49,435 production reports for 2010.

Bonding/Ownership

Oil and gas well bond release does not occur until an owner has successfully plugged and restored or transferred ownership and liability of *all* oil and gas wells under the operator's permits in Ohio. During 2011, 159 bonds were released and 140 new owners were registered.

Section staff also manages all information and records concerning current well ownership and well transfers. During 2011, records were managed for 5,722 registered well owners, including 4,283 domestic owners and 1,439 commercial owners. Staff also recorded 4,759 changes in well ownership. There are 64,481 active wells in Ohio.

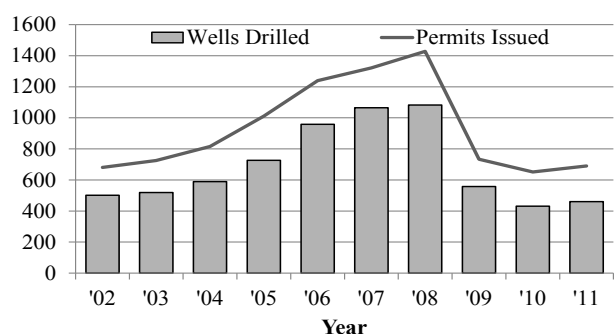
**Figure 1 - Oil & Gas Permits Issued
2009 - 2011**



Drilling

A continued reduction in market prices resulted in the second lowest number of wells drilled since at least 1887 (Appendix I). It is anticipated that drilling to the Utica/Point Pleasant Shale in 2012 will reverse this trend. In 2011, an estimated 460 oil and gas wells were drilled, which was an increase of 33 wells (7.7%) from 2010 (Figure 2). Wells were drilled in 42 of Ohio's 88 counties, a decrease of two (Figure 3).

**Figure 2 - Drill Permits vs. Wells Drilled
2002 - 2011**



Completions

Of the well completion reports submitted by March 2, 2012 to the division, 333 were productive and 27 were dry holes, for a 93% productive rate (Table I).

- Total footage is estimated at 1,994,203 feet compared to 1,718,768 for 2010.
- Average well depth was 4,335 feet, an increase of 310 feet per well.
- The median well depth was 4,254 feet.
- Total depths ranged from 572 feet in the Berea Sandstone (Licking County) to 14,445 feet in the Utica/Point Pleasant Shale for a horizontal well (Carroll County).

A summary of oil and gas completion statistics by county appears in Table II.

Completion zones ranged from the Pennsylvanian Cow Run to the Precambrian granite. Guernsey, Muskingum and Tuscarawas counties had wells drilled to four different geologic zones. The Clinton sandstone and Knox formations accounted for 69% of all wells drilled. A summary of oil and gas completion statistics by producing zones appears in Table III.

Formation Highlights

The Clinton sandstone was the most actively drilled zone accounting for 47% percent of all wells drilled. An estimated 215 wells were drilled, 13 less than the 228 wells drilled in 2010. Clinton sandstone wells averaged 4,301 feet in depth, an increase of 154 feet per well. Clinton sandstone wells were drilled in 21 counties, the same as last year. The most active counties were Stark (37), Knox (32), Mahoning (20), Summit (19) and Coshocton (17).

An estimated 51 Berea Sandstone wells were drilled, four more than last year. Drilling occurred in 13 counties. Meigs led with 13 wells followed by Tuscarawas (7).

An estimated 51 wells were drilled to the Ohio Shale, an increase of 11 wells. Drilling occurred in six counties. Belmont County led with 26 wells followed by Monroe (16). The average depth per well was 3,146 feet, a decrease of 77 feet per well.

The first horizontal Utica/Point Pleasant Shale well was drilled and put into production in 2011. Overall, 25 wells were drilled in 10 counties; Carroll County (12) was the most active. Five are producing and the rest are waiting to be completed or put into production.

Drilling to the Knox formations increased. There were 103 wells drilled, 16 more than in 2010. Drilling occurred in these formations: Beekmantown (31), Rose Run (26) and Trempealeau (46). Drilling occurred in 20 counties with Huron (15), Muskingum (14), Guernsey and Knox (9 each) the most active.

Wells Completed by Month and Owner

Drilling activity averaged 38 wells per month compared to 36 per month in 2010. August was the most active month with 56 wells (Figure 4).

One hundred and twenty-one owners drilled wells in 2011. Ninety-three percent of these owners drilled less than 10 wells. The highest number of wells drilled by a single owner was 37 (Figure 5) and the 10 most active operators drilled 47% (216) of all wells.

Wells Completed by Type of Tool

Rotary tools drilled the majority of wells. Cable-tool rigs drilled 29 wells and operated in nine counties. Knox County (7) had the highest number of cable tool operations. Cable tool depths

Plug-back and Deepen Operations

2011 Ohio Oil & Gas Activities

Table I – Drilling Operations by Type of Well – 2011

	Drilled	Converted	Total Footage
Productive Wells	338		1,467,147
Dry Holes	27		115,231
Reopened Wells	8		0
Lost Holes	9		14,762
Gas Storage Wells	9		37,700
Conventional Brine Injection Wells	7	12	60,699
Stratigraphic Test Wells	25		183,862
Solution Mining Wells	0		0
TOTAL	423	12	1,879,401

Ten Most Active Counties

Knox and Stark counties tied for first with 43 wells drilled (Table IV). Knox had an increase of 11 wells and drilling occurred in the Clinton and Trempealeau formations. Stark had an increase of 21 wells with the majority of drilling to the Clinton sandstone. Cuyahoga County, ranked first in 2010, had a decline of 23 wells and dropped to 16th overall.

Eight of these counties were in the top 10 last year with three new counties this year. Overall, the largest well increase occurred in Belmont County (25) putting it in the top 10 for the first time ever. The two other counties were last in the top 10: Summit (1995) and Tuscarawas (2009). The biggest well decreases, in addition to Cuyahoga, took place in Trumbull (17) and Washington (11) counties.

Directional Drilling

Directional drilling is used to access oil and gas in the following ways: under environmentally sensitive areas or densely populated areas, and to enhance production. One hundred and forty-two directional drilling permits were issued to drill wells in 26 counties, which was an increase of 97 permits and 14 counties from 2010.

The majority of these permits were horizontal and issued to these formations: Utica/Point Pleasant Shale (95), Upper Devonian Shale (10), Marcellus Shale (8), Trenton Limestone (3), Clinton sandstone

(2) and Berea Sandstone (1). The majority of remaining permits were issued to the Clinton sandstone (19) in northeastern Ohio. The most active counties were Carroll (35), Jefferson (13), Belmont and Mahoning (10 each).

Exploratory Wells

Seventeen percent (80) of all wells completed were classified as exploratory which is more than double compared to 2010 (Figure 6). Of these, 71 were productive and nine were dry, representing a 89% success rate.

Wells were drilled in 24 counties. Belmont and Carroll (13 each) were the most active counties, followed by Guernsey, Huron and Knox (6 each).

The majority of exploratory wells were classified as either 'outposts' (25) or 'deeper pool wildcats' (40). Productive rates were as follows: 'outposts' - 96% and 'deeper pool wildcats' - 88%.

As predicted last year, the unprecedented leasing activity for the Utica/Point Pleasant Shale did result in 24 exploratory wells being drilled to it in 2011. Drilling below the Knox unconformity increased with 31 exploratory wells. Wells drilled to formations below the Knox unconformity such as the Beekmantown dolomite (7), Rose Run sandstone (5), and Trempealeau dolomite (18) are almost always seismic prospects. Five of these wells were dry holes. The Ohio Shale was also active with 16 wells; of these 12 were in Belmont County.

Table II - Oil and Gas Completion Statistics by County – 2011

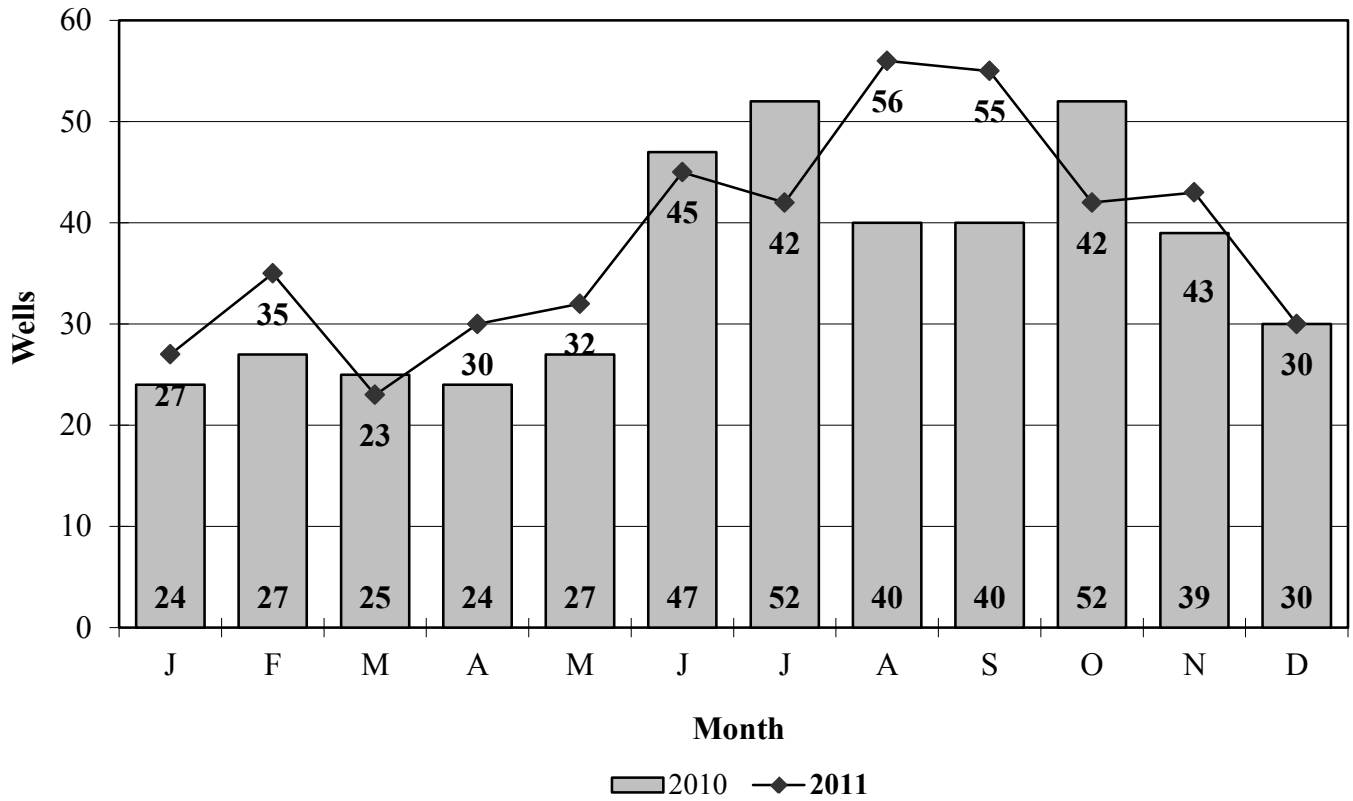
County	Depth Range of Reservoirs		Major Targeted Reservoirs	Development		Exploratory		Total Wells	Percent Productive	Drilled Footage		
	Shallow	Deep		Productive	Dry	Productive	Dry			Productive	Dry	Total
Ashland	525	676	Berea	1	2	0	0	3	33.33	800	1,331	2,131
Ashtabula	2,932	3,666	Clinton	5	0	0	0	5	100.00	16,928	0	16,928
Athens	1,517	1,897	Berea	4	0	0	0	4	100.00	6,857	0	6,857
Belmont	1,622	5,198	Ohio Shale	13	0	13	0	26	100.00	90,281	0	90,281
Carroll	5,250	7,730	Utica/Point Pleasant	2	0	13	0	15	100.00	124,265	0	124,265
Columbiana	6,983	7,599	Utica/Point Pleasant	0	0	1	0	1	100.00	3,923	0	3,923
Coshocton	975	4,604	Clinton	8	0	0	1	9	88.89	26,906	6,606	33,512
Cuyahoga	3,087	3,788	Clinton	14	0	0	0	14	100.00	52,200	0	52,200
Geauga	3,646	5,934	Clinton	7	0	0	1	8	87.50	29,206	6,783	35,989
Guernsey	1,370	6,411	Beekmantown	9	1	6	0	16	93.75	82,739	7,042	89,781
Harrison	1,147	8,517	Utica/Point Pleasant	1	0	1	0	2	100.00	8,083	0	8,083
Hocking	4,956	4,976	Rose Run	0	0	1	0	1	100.00	5,103	0	5,103
Holmes	700	5,864	Rose Run	4	0	0	0	4	100.00	18,121	0	18,121
Huron	3,099	3,382	Trempealeau	6	3	6	0	15	80.00	40,882	10,365	51,247
Jefferson	8,519	9,206	Utica/Point Pleasant	0	0	2	0	2	100.00	18,674	0	18,674
Knox	2,143	4,470	Clinton	26	0	6	0	32	100.00	100,438	0	100,438
Lake	3,313	3,353	Clinton	1	0	0	0	1	100.00	3,496	0	3,496
Licking	611	4,234	Clinton	13	1	4	0	18	94.44	48,270	572	48,842
Mahoning	4,984	5,840	Clinton	20	0	1	0	21	100.00	117,197	0	117,197
Marion	1,416	3,288	Trempealeau	1	0	0	0	1	100.00	3,288	0	3,288
Medina	3,556	4,870	Clinton	1	0	0	1	2	50.00	3,710	4,870	8,580
Meigs	631	4,506	Cow Run	1	0	3	0	4	100.00	7,992	0	7,992
Monroe	1,235	2,627	Ohio Shale	15	0	1	0	16	100.00	39,990	0	39,990
Morgan	1,340	1,366	Berea	2	0	0	0	2	100.00	2,850	0	2,850
Morrow	2,979	3,890	Trempealeau	5	2	0	0	7	71.43	17,758	6,675	24,433
Muskingum	1,110	6,868	Beekmantown	16	3	4	0	23	86.96	104,616	18,961	123,577
Perry	1,170	3,590	Clinton	2	1	0	0	3	66.67	7,059	1,171	8,230
Pickaway	556	2,636	Rose Run	0	2	0	2	4	0.00	0	10,323	10,323
Portage	4,077	6,160	Clinton	11	0	3	0	14	100.00	71,915	0	71,915
Ross	3,748	3,870	Knox Group	0	0	0	1	1	0.00	0	3,870	3,870
Stark	4,146	7,580	Clinton	38	0	2	0	40	100.00	220,258	0	220,258
Summit	3,421	4,010	Clinton	11	0	0	0	11	100.00	45,157	0	45,157
Trumbull	3,920	5,296	Clinton	11	0	0	0	11	100.00	55,865	0	55,865
Tuscarawas	1,090	7,674	Beekmantown	12	2	2	2	18	77.78	58,714	29,618	88,332
Washington	845	990	Cow Run	0	0	2	0	2	100.00	1,915	0	1,915
Wayne	3,074	5,426	Clinton	6	1	0	0	7	85.71	28,157	5,624	33,781
Wyandot	1,397	1,410	Trenton	1	0	0	1	2	50.00	3,534	1,420	4,954
TOTAL				267	18	71	9	365	92.60	1,467,147	115,231	1,582,378

Note: No completion information was available at the time of this printing for the following counties: Fairfield, Lawrence, Richland, Sandusky and Seneca.

Table III - Oil and Gas Completion Statistics by Producing Zone – 2011

Producing Zones	Depth Range of Reservoirs		Development		Exploratory		Total Wells	Percent Productive	Drilled Footage		
	Shallow	Deep	Productive	Dry	Productive	Dry			Productive	Dry	Total
Pennsylvanian (Cow Run)	588	990	0	0	4	0	4	100.00	3,472	0	3,472
Mississippian (Keener)	1,235	1,250	1	0	0	0	1	100.00	1,275	0	1,275
Mississippian (1st & 2nd Berea)	525	1,784	23	4	0	0	27	85.19	29,974	3,074	33,048
Devonian (Ohio Shale)	1,622	4,012	28	0	16	0	44	100.00	138,440	0	138,440
Silurian (Clinton - Medina)	2,202	5,840	174	0	2	0	176	100.00	756,890	0	756,890
Ordovician (Utica/Point Pleasant)	7,602	7,820	0	0	24	0	24	100.00	175,720	0	175,720
Ordovician (Trenton - Gull River)	1,397	6,704	2	0	0	3	5	40.00	6,822	10,345	17,167
Ordovician (Beekmantown)	5,814	7,674	17	4	7	0	28	85.71	168,120	27,693	195,813
Cambro-Ordovician (Rose Run)	2,617	7,580	6	4	3	2	15	60.00	60,720	31,593	92,313
Cambrian (Trempealeau)	2,328	5,573	16	6	15	3	40	77.50	125,714	33,806	159,520
PreCambrian	8,450	8,720	0	0	0	1	1	0.00	0	8,720	8,720
TOTAL			267	18	71	9	365	92.60	1,467,147	115,231	1,582,378

**Figure 4 - Wells Completed by Month
2010 - 2011**



**Figure 5 - Wells Completed by Owner
2011**

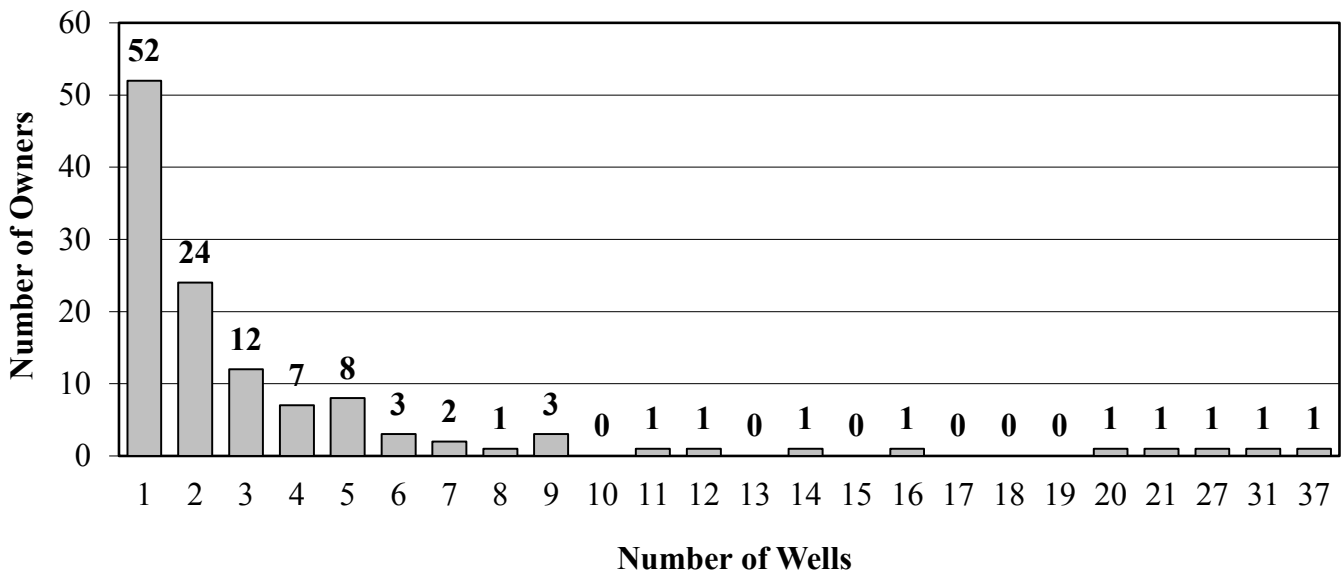
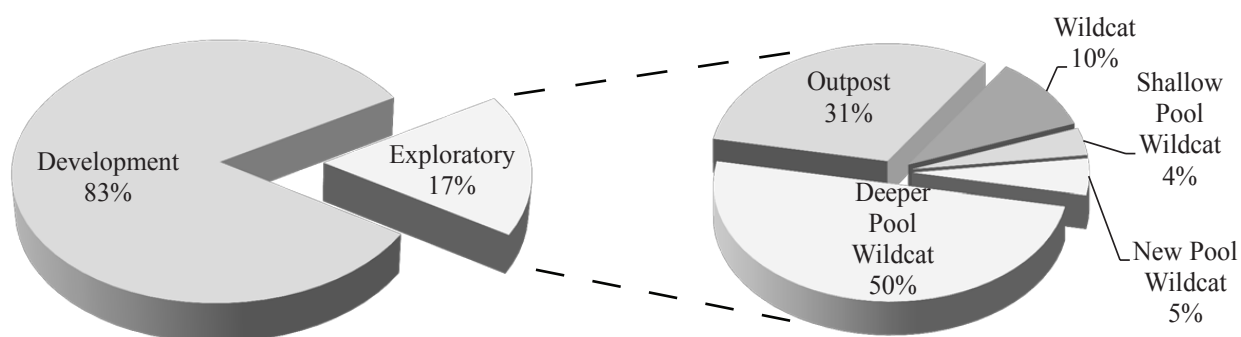


Table IV - Ten Most Active Counties - 2011					
2011 Rank	County	Wells Drilled	2010 Rank	Avg. Depth Per Well	Est. Footage Drilled
1	Knox	43	(2)	3,139	134,977
1	Stark	43	(5)	5,506	230,758
3	Belmont	28	(31)	3,472	97,216
4	Coshocton	25	(9)	3,724	93,100
4	Muskingum	25	(8)	5,373	134,325
6	Licking	24	(4)	2,713	65,112
7	Mahoning	21	(10)	5,581	117,197
8	Guernsey	20	(10)	5,611	112,220
9	Meigs	19	(21)	1,998	37,962
9	Summit	19	(6)	4,105	77,995
9	Tuscarawas	19	(17)	4,907	93,233

**Figure 6 - Development vs. Exploratory Wells
2011**



County Drilling Depth Records

Exploration to the Utica/Point Pleasant Shale and the drilling of new Class II injection wells resulted in five new drilling depth records (Appendix II). In Jefferson County, a well was drilled 9,700 feet into the Trenton Limestone, 1,647 feet deeper than the former record holding well drilled in 1984. In Mahoning County, a well was drilled 10,088 feet into the Precambrian Granite, 896 feet deeper than the former record holding well drilled in 2010. In Monroe County, a well was drilled 9,310 feet

into the Trenton Limestone, 1,803 feet deeper than the former record holding well drilled in 1989. In Trumbull County, a well was drilled 9,038 feet into the Precambrian Granite, 1,316 feet deeper than the former record holding well drilled in 1998. In Tuscarawas County, a well was drilled 8,720 feet into the Precambrian Granite, 25 feet deeper than the former record holding well drilled in 2007. Additionally, in Carroll County, a horizontal well was drilled 14,445 feet into the Utica/Point Pleasant Shale, making it the longest well ever drilled.

Production

Ohio's total reported crude oil production was 4,852,964 barrels (Figure 7, Table V), an increase of 68,274 barrels (1.43%) from 2010. In 2011, daily production averaged 13,296 barrels compared to 13,109 barrels in 2010. Through 2011, Ohio wells have produced 1,141,380,706 barrels.

Ohio wells produced 73,289,838 mcf of natural gas, a decrease of 4,831,685 mcf (6.18%) from 2010 (Figure 7, Table V). Gas production figures include

an estimated 725,642 mcf of natural gas used on the lease. In 2011, daily production averaged 200,794 mcf compared to 214,032 mcf in 2010. Through 2011, Ohio wells have cumulatively produced 8,593,388,085 mcf of natural gas.

The 2011 production numbers are an estimate based on available data at the time of calculation and were compiled by the Ohio Oil and Gas Association; oil reserve, gas reserve and gas consumption totals are based on data from the Department of Energy, Energy Information Administration.

**Figure 7 - Oil & Gas Production
2002 - 2011**

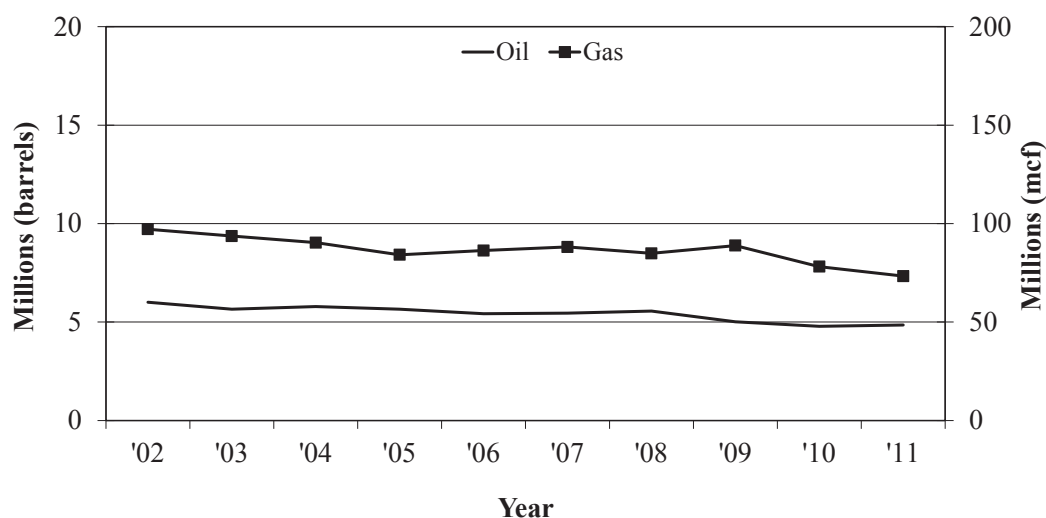


Table V – Crude Oil & Natural Gas Production, Reserves & Consumption – 2002 - 2011

	Oil (thousands of barrels)		Gas (mmcf)		
Year	Production	Reserves	Production	Reserves	Consumption
2002	6,004	67,000	97,154	1,117,000	830,955
2003	5,647	66,000	93,641	1,126,000	848,388
2004	5,785	49,000	90,301	974,000	825,753
2005	5,652	46,000	84,135	898,000	825,961
2006	5,422	49,000	86,315	975,000	742,440
2007	5,455	48,000	88,095	1,027,000	806,350
2008	5,554	38,000	84,858	985,000	792,247
2009	5,009	38,000	88,824	896,000	740,925
2010	4,785	N/A	78,122	N/A	783,096
2011	4,853	N/A	73,290	N/A	N/A

Market Value

Crude oil production valued at \$437,055,240 increased 22.74% (\$80,966,184) from its 2010 value. The average price per barrel was \$90.06, a 21% increase from 2010's average price of \$74.42 per barrel (Table VI). Posted oil prices ranged from a low of \$70.72 (Oct. 4th) to a high of \$108.25 (Apr. 1st) per barrel. During 2011, the daily posted price for Ohio crude oil was on average \$7.23 less than the

near-month settle price for crude oil (CL) at the New York Mercantile Exchange (NYMEX).

The market value of natural gas decreased 14.18% (\$51,340,872) to \$310,659,568. The average price paid per mcf was \$4.28 in 2011, a decrease of \$0.40 per mcf from 2010 (Table VI). The Appalachian price index, based on a weighted average between Columbia and Dominion, ranged from a low of \$3.47 in December to a high of \$4.53 in May.

Ohio's combined oil and gas market value increased by 4.13% (\$29,625,312). The total dollar value was \$747,714,808 (Figure 8).

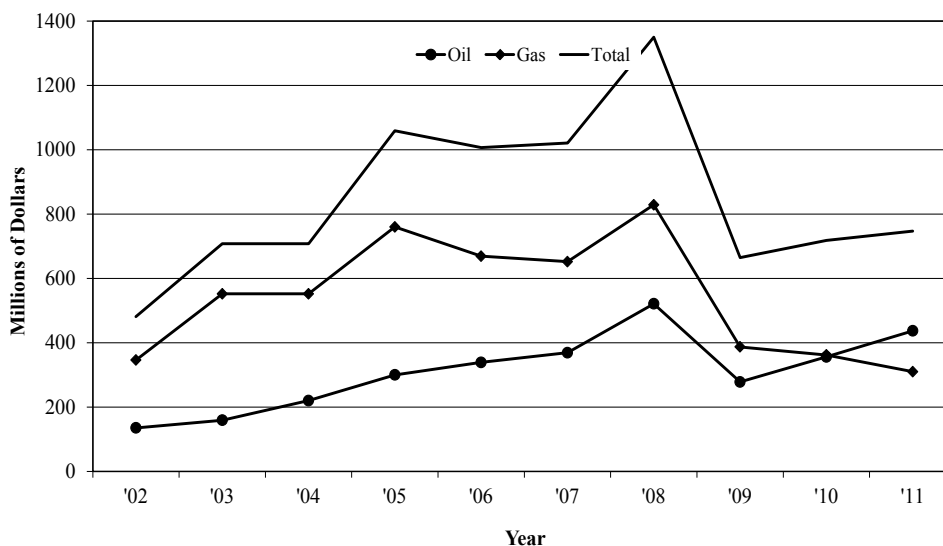
Plugging Activity

Plugging activity declined by 74 wells. Figure 9 compares plugging and drilling activity. In 2011, 355 wells were plugged compared to 429 in 2010. This total does not include dry or lost holes that were plugged in 2011. Fifteen of these wells were plugged through the Orphan Well Program, including two funded through the Landowner Grants Program. Additionally, three previously plugged wells were reopened for the purpose of replugging them.

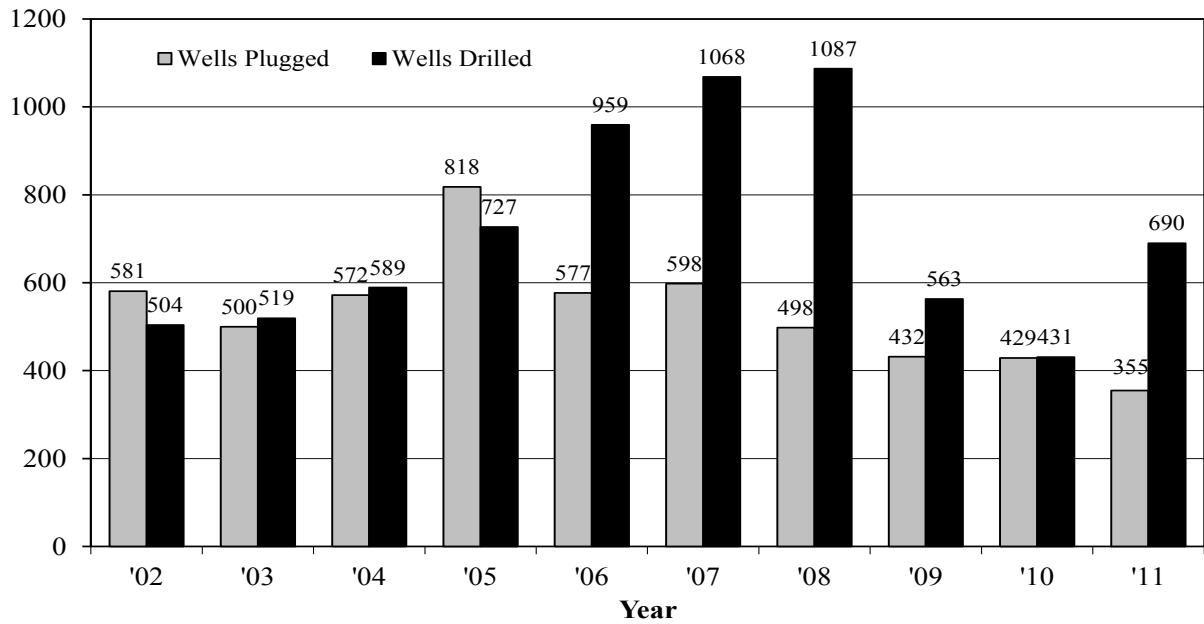
Wells were plugged in 39 counties (Figure 10). Licking County (50) was the most active plugging county followed by Muskingum (33), Perry (31) Morgan (22), and Noble and Wayne (21 each).

Table VI - Average Wellhead Price of Oil & Gas 2002 - 2011		
Year	Oil \$/Bbl	Gas \$/Mcf
2002	\$22.50	\$3.56
2003	\$27.64	\$5.90
2004	\$38.00	\$6.65
2005	\$53.03	\$9.03
2006	\$62.43	\$7.75
2007	\$67.69	\$7.40
2008	\$93.79	\$9.77
2009	\$55.56	\$4.36
2010	\$74.42	\$4.68
2011	\$90.06	\$4.28

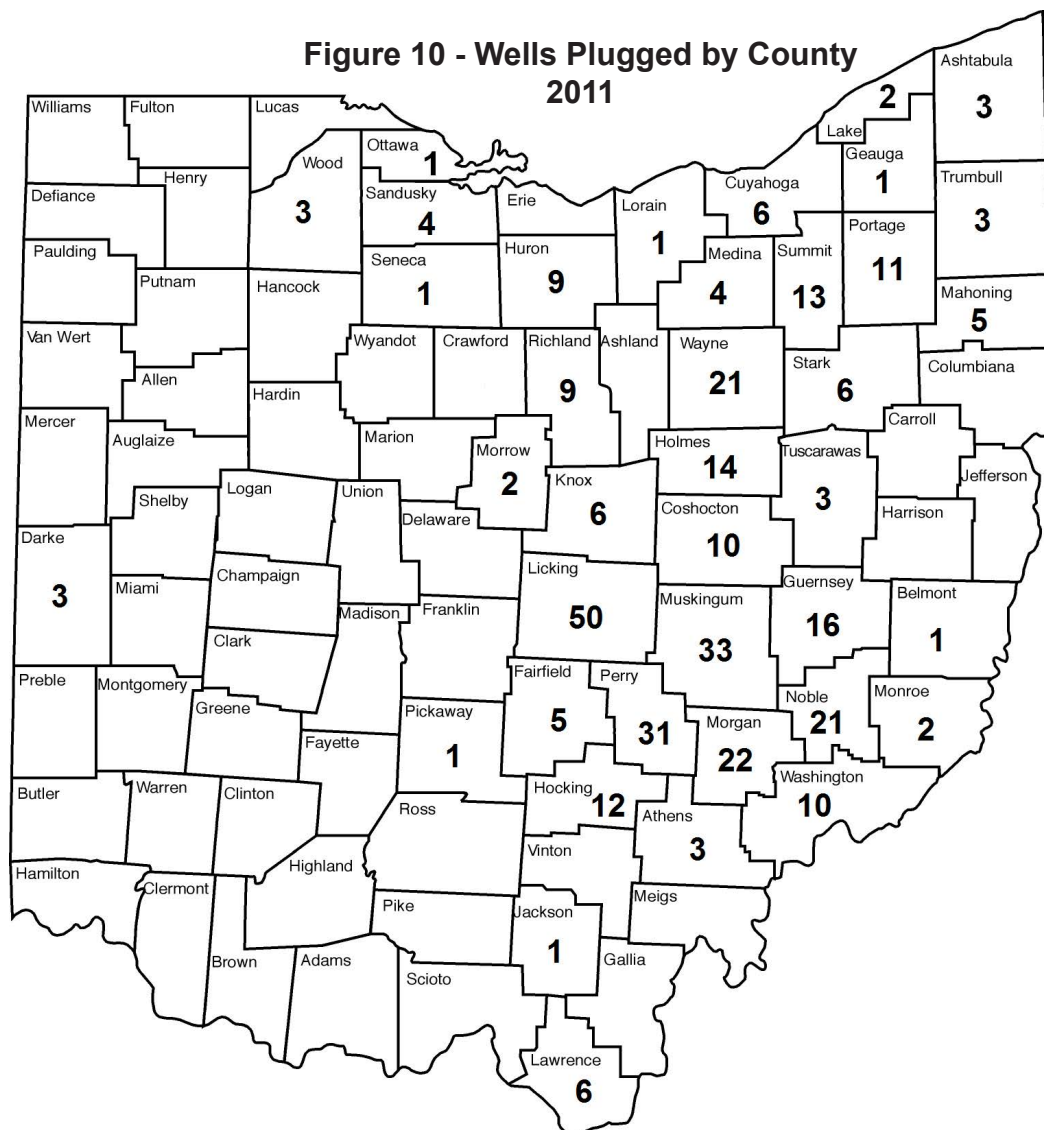
**Figure 8 - Dollar Value of Oil & Gas
2002 - 2011**



**Figure 9 - Wells Plugged vs. Wells Drilled
2002 - 2011**



**Figure 10 - Wells Plugged by County
2011**



Appendix 1 – Wells Drilled in Ohio

Year	Productive	Dry	Total	Berea	Ohio Shale	Clinton	Trenton	Rose Run	Cambrian
Prior (a) 1888 (b)	6,022	---	6,022				2,234		
1888 (1)	617	---	617				542		
1889	1,590	132	1,722				702		
1890	2,497	96	2,593				2,151		
1891	1,709	56	1,765				1,572		
1892	1,551	38	1,589				1,465		
1893	2,067	46	2,113				1,877		
1894 (c)	3,216	85	3,301				3,001		
1895	6,020	127	6,147				5,559		
1896 (d)	5,600	856	6,456				4,339		
1897	3,442	300	3,742			987	2,755		
1898	3,338	172	3,510			132	2,852		
1899	6,399	408	6,807			151	4,469		
1900	6,098	457	6,555			116	5,013		
1901	4,559	573	5,132			148	3,524		
1902	5,651	649	6,300			306	4,213		
1903	5,880	777	6,657			352	4,072		
1904	4,974	858	5,832			382	3,141		
1905	3,027	680	3,707			400	1,578		
1906	2,903	681	3,584			388	1,535		
1907	2,146	611	2,757			521	890		
1908	2,083	695	2,778			522	848		
1909	2,881	966	3,847			694	873		
1910	2,059	670	2,729			668	572		
1911	2,270	507	2,777			641	527		
1912	3,527	956	4,483			926	551		
1913	2,560	603	3,163			643	972		
1914	2,371	534	2,905			943	861		
1915	1,672	498	2,170			952	260		
1916	2,028	525	2,553			469	699		
1917	1,864	504	2,368			587	535		
1918	1,708	446	2,154			605	466		
1919	2,486	585	3,071			940	385		
1920	2,421	722	3,143			1,240	565		
1921	1,675	620	2,295			853	461		

Appendix 1 – Wells Drilled in Ohio									
Year	Productive	Dry	Total	Berea	Ohio Shale	Clinton	Trenton	Rose Run	Cambrian
1922	1,989	607	2,596			906	522		
1923	1,779	537	2,316			642	697		
1924	1,704	439	2,143			605	592		
1925	1,680	414	2,094			434	627		
1926	1,722	382	2,104			522	460		
1927	1,286	337	1,623				262		
1928	1,305	395	1,700				204		
1929	1,936	634	2,570				191		
1930	1,562	572	2,134				205		
1931	789	287	1,076				148		
1932	546	224	770				124		
1933	496	183	679				123		
1934	883	276	1,159				103		
1935	544	192	736				94		
1936	754	246	1,000				81		
1937	813	432	1,245						
1938	622	288	910						
1939	713	319	1,032						
1940	818	410	1,228						
1941	1,034	527	1,561						
1942	652	356	1,008						
1943	625	391	1,016						
1944	647	393	1,040						
1945	649	385	1,034						
1946	885	408	1,293						
1947	899	484	1,383						
1948	921	534	1,455						
1949	626	426	1,052						
1950 (2)	666	476	1,142	436	8	418	25		3
1951	626	435	1,061	394	10	406	18		6
1952	670	470	1,140	368	15	459	47		2
1953 (e)	711	386	1,097	359	21	402	30		6
1954	788	407	1,195	441	13	395	25		2
1955	898	336	1,234						
1956	878	367	1,245	364	13	663	32		5

Appendix 1 – Wells Drilled in Ohio

Year	Productive	Dry	Total	Berea	Ohio Shale	Clinton	Trenton	Rose Run	Cambrian
1957	773	268	1,041	260	12	579	21		2
1958	852	316	1,168	303	13	650	19		5
1959	843	315	1,158	300	11	672	20		13
1960	707	309	1,016	218	5	597	7		20
1961	809	295	1,104	257	10	619	4		42
1962	820	326	1,146	358	2	542	10		72
1963 (f)	748	407	1,155	266	2	443	14	4	302
1964	1,075	1,579	2,654	197	2	499	34	9	1,800
1965 (g)	904	801	1,705	195	2	635	53	16	729
1966	872	399	1,271	227	4	692	18	8	261
1967	953	258	1,211	170	17	853	18	4	132
1968	988	229	1,217	136	66	832	21	6	81
1969	926	183	1,109	104	17	863	13	10	56
1970	1,165	190	1,355	84	15	1,146	5	6	42
1971	1,065	173	1,238	98	11	1,038	5	5	37
1972	1,125	168	1,293	112	21	1,082	3	10	32
1973	1,337	166	1,503	76	31	1,345	5	5	26
1974	1,601	167	1,768	91	13	1,587	3	8	31
1975	1,105	115	1,220	62	6	1,103	5	17	22
1976	1,774	164	1,938	165	30	1,631	38	18	16
1977	2,455	171	2,626	390	34	2,083	33	11	15
1978 (h)	3,132	283	3,415	430	22	2,834	22	27	12
1979	3,480	179	3,659	542	131	2,848	22	29	23
1980	4,935	165	5,100	867	78	3,734	1	24	31
1981	5,685	400	6,085	733	543	4,366		16	50
1982	4,488	342	4,830	756	458	3,426		11	4
1983	4,000	299	4,299	557	533	3,203	1	7	51
1984	4,593	370	4,963	612	329	3,827		9	65
1985	3,546	214	3,760	345	315	3,042		19	94
1986	1,725	125	1,850	185	76	1,482		28	62
1987	1,721	161	1,882	153	40	1,454		70	55
1988	1,267	156	1,423	112	43	1,037		94	62
1989	1,153	159	1,312	69	145	890		92	77
1990	1,147	180	1,327	61	97	863		143	102
1991	1,001	170	1,171	89	89	794		116	108

Appendix 1 – Wells Drilled in Ohio

Year	Productive	Dry	Total	Berea	Ohio Shale	Clinton	Trenton	Rose Run	Cambrian
1992	710	165	875	100	51	465		139	87
1993	643	180	823	60	35	330	2	260	89
1994	601	182	783	26	13	301	9	269	75
1995	507	163	670	25	11	253	2	202	94
1996	559	166	725	35	42	253	1	219	90
1997	620	178	798	33	20	277	0	223	110
1998	383	135	518	66	16	154	0	161	61
1999	407	95	502	32	65	177	5	106	55
2000 (i)	455	112	567	18	14	281	3	124	77
2001	599	100	699	36	29	396	1	113	58
2002	432	72	504	8	48	265	0	88	47
2003	454	65	519	30	60	257	2	82	40
2004 (j)	534	55	589	32	97	319	1	66	24
2005	658	69	727	48	116	409	7	45	50
2006	915	45	960	90	134	636	8	18	23
2007	1,022	46	1,068	90	157	672	7	35	32
2008	1,027	61	1,088	124	155	661	1	21	38
2009	517	46	563	43	97	320	2	30	25
2010 (k)	382	45	427	47	40	228	5	18	42
2011 (l)	433	27	460	51	51	215	3	26	46
TOTAL (m)	221,635	42,597	264,232	12,938	4,554	80,578	71,123	3,067	5,759

References

- Years 1888-1950: Alkire, Robert L., 1951, Oil and Gas Production, History, Regulation, Secondary Recovery and Bibliography, 8, part 2 of Ohio Division of Geological Survey Report of Investigations: 45-46 pp.
- Years 1950-2011: Statistics from Annual Oil & Gas Statistical Reports published by Ohio Divisions of Oil & Gas Resources Management and Geological Survey. Numbers were not available for blank formation fields.

Historical Footnotes

- Ohio lays claim to the first discovery of oil from a drilled well. In 1814, saltwater well drillers struck oil in Olive Township of Noble County at 475 feet.
- Ohio's first commercial oil and gas well was put into production in 1860 at Macksburg in Washington County.
- Alkire notes that the statistics for years 1894-1904 were incomplete and estimated that the total number of wells not accounted for during those years is approximately 12,000.
- Ohio was the nation's leading oil producer in 1896.
- Widespread acceptance of the hydraulic fracture method for increasing production in 1953.
- Morrow County Oil Boom in 1963.
- Creation of Ohio Division of Oil and Gas in 1965.
- Tight formation tax credit.
- Creation of Ohio Division of Mineral Resources Management in 2000.
- Urbanized Drilling Law (HB 278) went into effect September 16, 2004.
- Senate Bill 165 went into effect June 30, 2010.
- Creation of Ohio Division of Oil and Gas Resources Management in 2011.
- Total number of wells may actually be 276,232. (See footnote c)

Appendix II – County Drilling Depth Records - 2011

COUNTY	TOWNSHIP	PERMIT NO.	OPERATOR	WELL NO.	LEASE NAME	COMPLETION DATE	TOTAL DEPTH	FORMATION AT T.D.	WELL CLASS
ADAMS	FRANKLIN	11	OXFORD OIL CO.	1	J. RUSSELL & M. TENER	07/07/79	3886	GRANITE WASH	FWC
ALLEN	SPENCER	64	ALCO OIL CO.	2	POHLMAN, FRUEND, ETZ HORN	12/31/65	3266	GRANITE	FWC
ASHLAND	LAKE	1762	ROY STEWART	1	KENNETH & REX MASHER	02/04/60	5485	TREMPEALEAU	DPWC
ASHTABULA	NEW LYME	2272	POI ENERGY	1	LAUTANEN	09/01/85	7124	GRANITE	DPWC
ATHENS	DOVER	3062	QUAKER STATE	2	MILLFIELD COAL & MINING	07/17/84	6525	ROSE RUN	FWC
AUGLAIZE	ST. MARYS	71	WEST OHIO OIL & GAS	1	D. & B. HOELSCHER	12/05/70	3067	GRANITE	DPWC
BELMONT	PEASE	611	DAVID R. HILL INC.	1	GEORGETOWN MARINE	12/06/10	13727	GRANITE	DPWC
BROWN	STERLING	6	SPENCER PETROLEUM CORP.	1	GRIFFITH	03/13/93	3350	GRANITE	FWC
BUTLER	LEMON	4	ARMCO STEEL CORP.	1	ARMCO STEEL CORP.	03/12/67	3296	"MIDDLE RUN"	IWDW
CARROLL	LEE	2059	ANSCHUTZ EXPLOR. CORP.	1	WHITE	09/15/10	9503	ROSE RUN	DPWC
CHAMPAIGN	WAYNE	20	INDUSTRIAL GAS ASSOC.	1	P. & C. HOFFMAN	06/28/78	3325	MT. SIMON	FWC
CLARK	MADISON	D-2	T. D. FRIEND	1	MATTISON	06/14/26	4647	PRE MT. SIMON	FWC
CLERMONT	STONELICK	3	CONTINENTAL OIL CO.	1	C. WIKOFF	07/03/60	3435	MT. SIMON	FWC
CLINTON	WILSON	10	STOCKER & SITLER INC.	1	COY	01/18/83	3603	GRANITE	FWC
COLUMBIANA	HANOVER	648	MANAGEMENT CONTROL	3	F. MURRAY	07/28/70	10242	GRANITE	DPWC
COSHOCTON	CRAWFORD	6397	LAKE REGION OIL INC.	2	LEVI M. TROYER	07/23/92	7950	MT. SIMON	DPWC
CRAWFORD	VERNON	6	HAYNES O & G ENTERPRISES	1	DON D. CRUM	01/09/63	3879	EAU CLAIRE	FWC
CUYAHOGA	MAYFIELD	1625	BASSENERGY CO. INC.	1	MARCONI MEDICAL SYSTEMS	03/07/01	6550	GRANITE	DPWC
DARKE	GREENVILLE	13-A	UNKNOWN	1	EDWARD BARNES	05/26/06	2850	CAMBRIAN	FWC
DEFANCE	MARK	28	S. E. BROWN	1	P. HAVER	10/22/62	3606	MT. SIMON	FWC
DELAWARE	TRENTON	354	R.C. POLING CO. INC.	1	COCKRELL-GODSHALL UNIT	01/22/91	4873	GRANITE	DPWC
ERIE	FLORENCE	19	SUN OIL CO.	1	A. HERMAN ETAL.	05/01/67	4466	GRANITE	SWIW
FAIRFIELD	RUSH CREEK	1136	HOPEWELL O. & G. DEV. CO.	1	R. BIGHAM	06/16/94	5924	GRANITE	DPWC
FAYETTE	UNION	1	KEWANEE OIL CO.	1	E. HOPKINS	07/12/57	4708	GRANITE	FWC
FRANKLIN	PLEASANT	7	BARNWELL PRODUCING CO.	1	OAKHURST COUNTRY CLUB	08/08/64	3753	MT. SIMON	FWC
FULTON	CHESTERFIELD	47	LIBERTY PETR. CORP.	1	CLYDE JOHNSTON	03/21/69	3793	MT. SIMON	FWC
GALLIA	HARRISON	985	BAKERWELL INC.	1	JARRELL UNIT	03/24/04	7146	TREMPEALEAU	FWC
GEAUGA	TROY	1534	LOMAK PETROLEUM	1	J. VOYTKO	07/01/88	6888	TREMPEALEAU	DPWC
GREENE	ROSS	4	TATUM PETR. CO. LLC.	1	KELLY GREENE	08/17/10	3347	GRANITE	FWC
GUERNSEY	WESTLAND	4067	DAVID R. HILL, INC.	1	DEVCO UNIT	03/16/08	8897	GRANITE	DPWC
HAMILTON	CROSBY	1	CONTINENTAL OIL CO.	1	WALTER C. BRISBIN	11/01/59	2730	EAU CLAIRE	FWC
HANCOCK	UNION	139	FRANK M. DEVER	1	C. & M. FRAZIER	06/02/64	3017	GRANITE	FWC
HARDIN	DUDLEY	79	MCMAHON-BULLINGTON	1	WOLF	01/07/64	3002	KNOX	FWC
HARRISON	GREEN	355	STOCKER & SITLER INC.	1	CHARLENE SCHANEY ETAL.	07/30/79	10288	TREMPEALEAU	DPWC
HENRY	HARRISON	36	CALLANDER & KIMBEL	1	K. HALL	10/10/73	3480	GRANITE	DPWC
HIGHLAND	FAIRFIELD	7	OHIO VALLEY OIL & GAS	1	COURTNEY	01/20/72	3610	GRANITE	FWC
HOCKING	STARR	1222	E. J. DUNIGAN	1	M. & H. HOCKMAN	06/30/66	6495	MT. SIMON	FWC
HOLMES	SALT CREEK	1283	G.C. & J.A. PARKER	1	DAN D. TROYER	11/12/63	7369	TREMPEALEAU	FWC
HURON	WAKEMAN	103	APPALACHIAN EXPLOR. INC.	1	WOLF	10/05/81	4574	GRANITE WASH	FWC
JACKSON	FRANKLIN	76	WORTHINGTON OIL CO.	1	G. & I. WOOD	07/08/64	6320	GRANITE	FWC
JEFFERSON	WAYNE	501	MARQUETTE EXPL., LLC	2-3	NORTH AMERICAN COAL	04/21/11	9700	TRENTON	ST
KNOX	PIKE	1413	DAVID L. CANTWAY	1	E. CUNNINGHAM	08/07/61	5745	GRANITE	FWC
LAKE	LEROY	1094	GREAT PLAINS EXPL. LTD.	1	VROOMAN	01/24/04	6355	GRANITE	DPWC

COUNTY	TOWNSHIP	PERMIT NO.	OPERATOR	WELL NO.	LEASE NAME	COMPLETION DATE	TOTAL DEPTH	FORMATION AT T.D.	WELL CLASS
LAWRENCE	SYMMES	174	J. STANLEY GOLDBERG	1	A. PAYNE	04/01/66	7002	GRANITE	FWC
LICKING	PERRY	4792	RONALD F. MORAN	1	RON MORAN	03/08/84	6237	GRANITE	SWIW
LOGAN	JEFFERSON	86	WORTHINGTON OIL CO.	1	LENA COMER	05/11/76	3402	MT. SIMON	FWC
LORAIN	GRAFTON	1370	KENOIL/KEN R. MILLER	1	LAWRENCE PALL	08/24/91	5018	TREMPEALEAU	DPWC
LUCAS	HARDING	60	LIBERTY PETR. CORP.	1	KETRING UNIT	08/24/72	3915	GRANITE	FWC
MADISON	FAIRFIELD	3	AMERADA PETR. CORP.	1	J. HUME	11/01/65	3631	GRANITE	FWC
MAHONING	BEAVER	3158	D & L ENERGY, INC.	4	NORTHSTAR LUCKY	10/21/11	10088	GRANITE	SWIW
MARION	CLARIDON	8	UNITED PRODUCING	1	H. & M. MITCHELL	03/14/62	3672	GRANITE	FWC
MEDINA	HINCKLEY	1143	WISER OIL CO.	1-A	F. L. SMITH	01/03/59	7040	GRANITE	FWC
MEIGS	LEBANON	3651	MURPHY OIL CO.	3	M. MCKELVEY	02/10/09	9082	TREMPEALEAU	DPWC
MERCER	CENTER	141	HARNER UNION OIL CO.	2	M. & M. YEWEL	02/09/71	3215	GRANITE	DPWC
MIAMI	LOST CREEK	3	NATIONAL ASSOC. PETR.	1	E. WALKER	10/30/58	3513	GRANITE	FWC
MONROE	WASHINGTON	4302	HG ENERGY, LLC	701S-5H	WHITACRE ENTERPRISES, INC.	10/24/11	9310	BLACK RIVER	ST
MONTGOMERY	MAD RIVER	D-2	DAYTON	M	DAYTON	01/1887	2440	UNKNOWN	UNKN.
MORGAN	CENTER	4533	ARTEX OIL COMPANY	1	BICKFORD UNIT	08/20/05	8222	ROSE RUN	DPWC
MORROW	PERRY	3737	STAR EXPL. CORP.	1	R. & W. BREWER	12/19/86	5000	GRANITE	DPWC
MUSKINGUM	HIGHLAND	7959	CGAS EXPLORATION INC.	7-2108	G. VICKERS	07/07/97	7316	TREMPEALEAU	DPWC
NOBLE	ELK	1278	AMERADA PETR. CORP.	1	R. ULLMAN	02/01/67	11442	GRANITE	DPWC
OTTAWA	CARROLL	50	FRED E. FITZGERALD	1	RAYMOND ARNDT	08/07/68	2287	ST. PETER	FWC
PAULDING	JACKSON	13	MT. PLEASANT MINES LTD.	1	H. & E. AREND	10/30/76	3440	GRANITE	FWC
PERRY	JACKSON	6595	R.C. POLING CO. INC.	1	RUSH CREEK PARTNERS, ETAL.	04/20/85	6395	GRANITE	SWIW
PICKAWAY	PICKAWAY	24	RAMCO OIL & GAS CORP.	1	M. KERNS	01/17/85	4500	GRANITE	FWC
PIKE	BEAVER	1	FRANK D. STAHLER	1	R. BAPST	06/14/50	4227	ST. PETER?	FWC
PORTAGE	DEERFIELD	2860	VIKING RESOURCES CORP.	1	VIKING RESOURCES CORP.	05/24/82	8800	GRANITE WASH	DPWC
PREBLE	WASHINGTON	D-3	DOC TOLLIVER	3	A. H. CHRISTMAN	06/01/29	1750	ST. PETER	FWC
PUTNAM	LIBERTY	31	OHIO OIL CO.	1	L. BARLAGE	03/21/44	3377	GRANITE	FWC
RICHLAND	WASHINGTON	431	TRI-STATE PRODUCING CO.	2	C. & K. SCOTT	09/05/66	5503	GRANITE	DPWC
ROSS	GREEN	8	WELL SUPERVISION INC.	1	M. IMMELL	08/24/64	4168	MT. SIMON	FWC
SANDUSKY	TOWNSEND	77	EAST OHIO GAS CO.	2	V. & I. HAFF	11/17/60	3128	GRANITE	FWC
SCIOTO	GREEN	212	USS CHEMICAL SUS STEEL	1	USS CHEMICAL SUS STEEL	07/05/68	5617	GRANITE	IWDW
SENECA	ADAMS	128	ASHLAND OIL	1	W. STIGAMIRE	01/24/65	3175	MT. SIMON	FWC
SHELBY	SALEM	13	GUMP OIL CO.	1	J. & B. FOGY	11/10/56	3360	GRANITE	FWC
STARK	PARIS	5052	VIKING RESOURCES CORP.	1	HANNA UNIT	09/02/97	8292	ROSE RUN	POOL
SUMMIT	TWINSBURG	1591	K.S.T. OIL & GAS CO.	5	K.S.T. OIL & GAS CO.	07/18/84	7225	GRANITE WASH	SWIW
TRUMBULL	LIBERTY	4043	D & L ENERGY, INC.	2	NORTHSTAR UNITED	08/21/11	9038	GRANITE	SWIW
TUSCARAWAS	OXFORD	5465	RED HILL DEVELOPMENT	1	GENERAL CLAY	01/23/11	8720	GRANITE	DPWC
UNION	DOVER	69	FUNK EXPLORATION	1	YODER	08/15/84	3500	GRANITE	FWC
VAN WERT	JENNINGS	44	WEST OHIO GAS CO.	5	A. & M. MILLER	01/05/73	3242	GRANITE	DPWC
VINTON	VINTON	924	COLUMBIA NAT. RES. INC.	723984	MORRIS	03/25/00	5700	TREMPEALEAU	FWC
WARREN	WAYNE	C-2627	OHIO GEOLOGICAL SURVEY	DS-2	AMERICAN AGGREGATES CORP.	04/26/89	5380	"MIDDLE RUN"	CORE
WASHINGTON	LAWRENCE	8666	CARTER RESOURCES	1	STRAUSS UNIT	12/06/89	10200	ROSE RUN	DPWC
WAYNE	CHIPPewa	71	EAST OHIO GAS CO.	2	N. STEINER	08/12/61	6919	GRANITE	DPWC
WILLIAMS	BRIDGEWATER	46	COLUMBIA GAS TRANS.	11061	COOK	12/31/71	4497	GRANITE WASH	FWC
WOOD	LIBERTY	D-6	J. S. BAILEY	1	P. KILLIAN	08/25/37	2927	GRANITE	DPWC
WYANDOT	JACKSON	D-8	DIBBLE & MILLER	1	P. PARSELL	03/07/47	5632	GRANITE	FWC

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