

Nomination **NOM-0010** Printable View

DRAFT	Submitted	Reviewed
Mark Status as Complete		

Details Comments

∨ Information

Percentage Of Interest
100.00%

Percentage Of Interest Type
Undivided

Source Deed
Book 269 Page 69 in the Carroll County Recorder's Office

Description Of Acreage
Parcel # 15-0000935.000 being more or less 0.055 gross acres located in Section 20-15N-6W located in Harrison Township, Carroll County, Ohio further described in attached Exhibit "A", Exhibit "B", & Exhibit "C".

Estimated Distance from well pad
Approximately 2.55 miles

Proposed Lease Bonus
\$3,500/acre for 0.055 net acres being a total bonus of \$192.50

Not A State Agency

Nomination Fee

Insurance And Financial Assurance

Obtained Identification Number

Nomination Number
23-DNR-0001

Status
Submitted

Company Name
Encino Acquisition Partners, LLC

First Name
Tanner

Middle Name

Last Name
Quiring

Street
5847 San Felipe St., Suite 400

City
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State
TX

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Country
US

Person Phone
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Person Email
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Notes (0) (/lightning/r/Nomination__c/a1D8y000000HIFSEA0/related/AttachedContentNotes/view) New

Files (2) (/lightning/r/Nomination__c/a1D8y000000HIFSEA0/related/AttachedContentDocuments/view) ∨

- 15-0000935.00 Nomination Plats - Exhibits
 May 30, 2023 • 940KB • pdf
</lightning/r/ContentDocument/0698y000007ID25AAE/view>
- 15-0000935.00 Nomination Packet
 May 30, 2023 • 1,015KB • pdf
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 Nomination
NOM-0010

May 30, 2023

Ohio Oil and Gas Land Management Commission
2045 Morse Road
Columbus, Ohio 43229-6693

RE: Nomination of State-Owned Lands
Parcel # 15-0000935.000
Harrison Township, Carroll County, Ohio

Dear Chair Richardson and Members of the Commission:

Please find enclosed Nomination of State-Owned Lands Form and its supporting documents. See **Exhibit A**.

In addition, and in accordance with R.C. 155.33, we ask that this Commission consider the following as it determines whether to approve or disapprove this nomination:

(a) Regarding the economic benefits to the State and its citizens resulting from an approval of this nomination, including those benefits to neighboring landowners who might not otherwise have their lands developed, please see attached **Exhibit B** containing the following:

1. Cleveland State University Shale Dashboard Study
2. PricewaterhouseCoopers (PwC) Impacts of the Oil and Natural Gas Industry on the US Economy in 2021
3. OOGA Sustainability Report

(b) Regarding whether the proposed oil or gas operation is compatible with the current uses of the lands made a part of this nomination, we note that this nomination contemplates a non-surface use lease with no surface impacts made to the nominated parcels.

(c) Regarding the environmental impact that may result if this nomination were approved, we note:

1. As noted above, this nomination contemplates the development of the nominated parcels without impacting the surface lands or its present uses.
2. Operations are governed by and undertaken in accordance with Federal and Ohio statutes and regulations that protect against adverse environmental impacts from natural gas and oil drilling, completion, production, and waste management activities (see, e.g., the Clean Air Act, Clean Water Act, Safe Drinking Water Act, Right-To-Know Laws, and R.C. 1509.10, 1501:9-1).

(d) Regarding potential subsurface impacts, there is no reason to believe that the horizontal drilling and completion operations contemplated in this nomination will have any adverse geological impacts.

(e) Regarding potential impacts on visitors or users of the parcels made a part of this nomination:

1. There was and continues to be significant support for the leasing of oil and gas underlying Carroll County for development.
2. In addition, but for this Commission leasing these parcels, a significant number of private mineral owners would find their acreage stranded and excluded from area development. These owners would endure substantial adverse economic impacts as all unit(s) associated with these nominated parcel(s) have Surface Use Agreements or proposed well pad locations with adjacent private mineral owners.
3. Moreover, the substantial resources accruing to the State from this contemplated development will likely, at least in part, be used to make material improvements to the park enhancing visitor and user experience. See **Exhibit C**. The Muskingum Watershed Conservancy District (MWCD) provides an actionable example of how the leasing and development of public use lands can and should occur. The 2021 audit clearly states, “The overall increase in operating revenue is a combination of increases in oil and gas activity and park camping activity.” This case study provides a clear example of the positive impacts made for MWCD visitors as a result of oil and gas activity and the actions taken by the MWCD.

Thank you in advance for your consideration and due diligence to ensure that Ohio selects the right producer to partner with and develop the State’s mineral interests.

EXHIBIT A

Nomination of State-Owned Lands Form and Associated Exhibits

EXHIBIT B

Cleveland State University Shale Dashboard Study
Price Waterhouse Coopers (PwC) Impacts of the Oil and Natural Gas Industry on the US
Economy in 2021
OOGA Sustainability Report

EXHIBIT C

Muskingum Watershed Conservancy District (MWCD) 2021 Annual Report
Muskingum Watershed Conservancy District (MWCD) 2021 Audit Report

Exhibit "A"

Attached to and made a part of that certain Nomination of State-Owned Lands
Letter dated May 30, 2023, Parcel 15-0000935.000, Carroll County, Ohio

- Nomination of State-Owned Lands and Associated Exhibits

NOMINATION OF STATE-OWNED OR CONTROLLED FORMATION FOR THE EXPLORATION FOR AND DEVELOPMENT AND PRODUCTION OF OIL OR NATURAL GAS



OHIO OIL AND GAS LAND MANAGEMENT COMMISSION

Box 1- Identification of Formation and Parcel(s) of Land Nominated for Leasing

1.) Percentage of interest owned or controlled by state agency: 100% Divided Undivided Partial

2.) Description of Nominated Parcel(s) of Land:

a.) Source Deed/Instrument (By Book and Page Number): Book: 269 Page: 69 in the Carroll County Recorder's Office

b.) Description of Acreage of the Parcel and an Identification of the County, Section, Township, and Range in Which the Parcel is Located

Parcel # 15-0000935.000 being more or less 0.055 gross acres located in Section 20-15N-6W located

in Harrison Township, Carroll County, Ohio

further described by Exhibit "A" – Acreage Description

3.) Plat Map Depicting the Area in Which the Parcel is Located: **(PLEASE UPLOAD/ATTACH)** – Attached Exhibit "B"

4.) Estimated Distance of the well pad to the state owned or controlled property: Approximately 2.55 miles

further described in attached Exhibit "C"

5.) Any Additional Documentation to support nomination: **(PLEASE UPLOAD/ATTACH)** – Attached Packet

Box 2- Information About the Person or Entity Submitting the Nomination

1.) Company Name (If Applicable): Encino Acquisition Partners, LLC

2.) Contact Information:

First Name: Tanner Middle Name: _____ Last Name: Quiring

2.) Address:

Street: 5847 San Felipe St., Suite 400 City: Houston

State: TX Zip: 77057

3.) Telephone Number: 346-240-3232

4.) Email Address: tquiring@encinoenergy.com

Box 3- Proposed Lease Bonus

As the person or entity submitting this nomination, I hereby propose a lease bonus as follows:

\$3,500/acre for 0.055 net acres being a total bonus of \$192.50

I am not a state agency, and I understand that my nomination will serve as the opening bid to lease the nominated formation. (Please Complete Box 4)

I am a state agency (You Do Not Need To Complete Box 4)

Box 4- Fees, Registration and Financial Assurance (TO BE COMPLETED IF THE PERSON MAKING THE NOMINATION IS NOT A STATE AGENCY):

Please Check All Boxes Below And Submit Applicable Documents:

a.) A nomination fee of \$150 is being submitted with this nomination.

b.) I certify that I (or the entity on behalf of which I submit this form) have obtained the insurance and financial assurance required under section 1509.07 of the Revised Code.

c.) I certify that I (or the entity on behalf of which I submit this form) registered with and obtained an identification number from the division of oil and gas resources management under section 1509.31 of the Revised Code.

****PURSUANT TO O.R.C. 155.339(A)(3) THE INFORMATION CONTAINED IN BOXES 2-4 IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED TO THE PUBLIC UNTIL A LESSEE IS SELECTED IN ACCORDANCE WITH THE STATUTE****

Any Questions Can Be Directed To:

Commission.Clerk@oglmc.ohio.gov

EXHIBIT "A"

Attached to and made a part of that certain Nomination of State-Owned Lands dated May 30, 2023, Parcel
15-0000935.00000, Carroll County, Ohio

Tax Parcel	Entity	Gross Acres	Township	County	Section	TWN	RNG	Source Deed (BK/PG)
15-0000935.000	State of Ohio	0.055	Harrison	Carroll	20	15N	6W	269/69

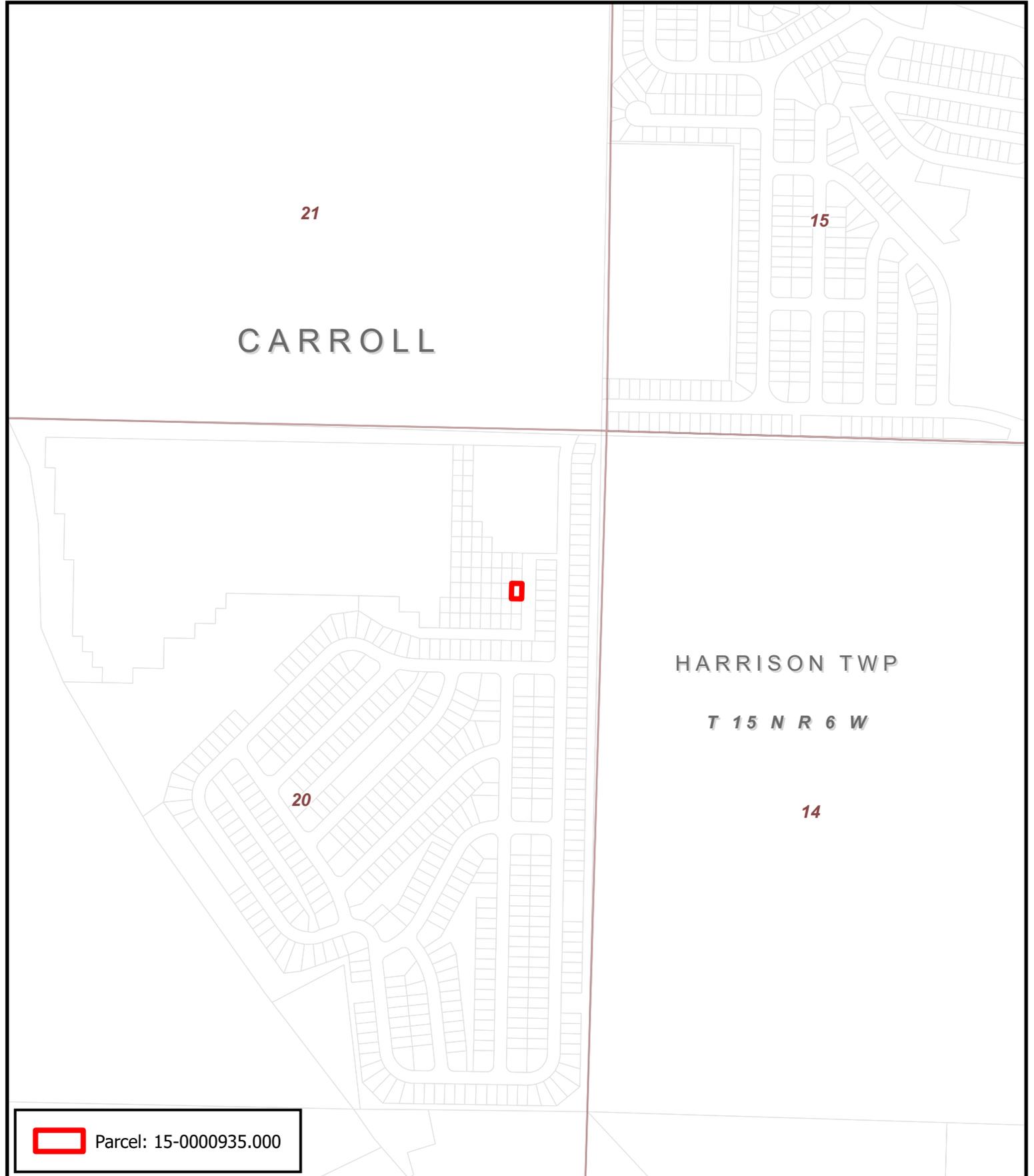
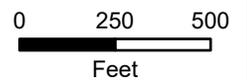


Exhibit "B"
Parcel 15-000935.000 Location Plat
Harrison Township
Carroll Co., OH
1 inch =500 feet



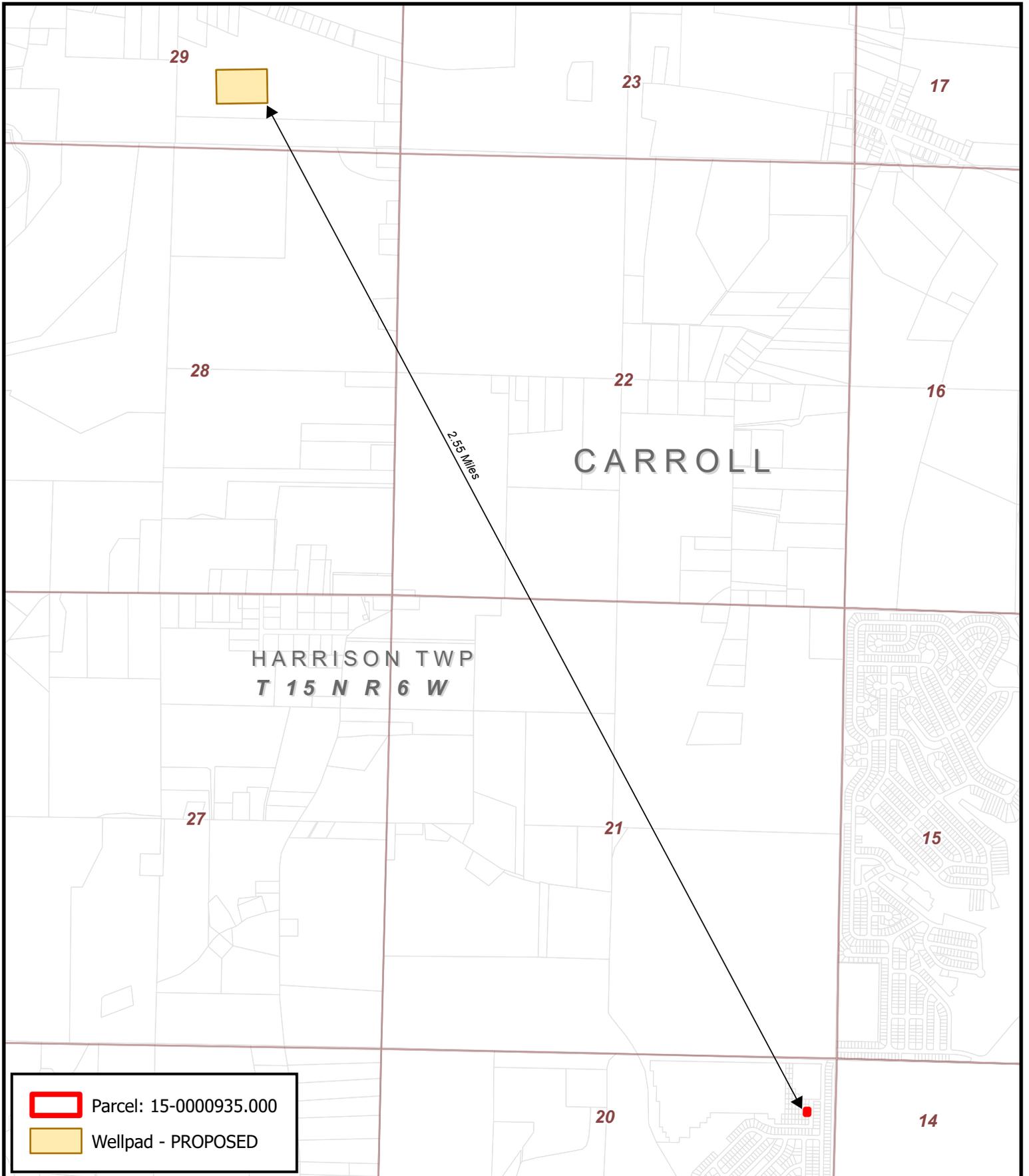


Exhibit "C"

**Parcel 15-0000935.000 Development Plat
Harrison Township
Carroll Co., OH**

1 inch = 1,500 feet

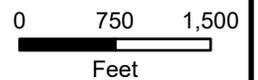


Exhibit "B"

Attached to and made a part of that certain Nomination of State-Owned Lands
Letter dated May 30, 2023, Parcel 15-0000935.000, Carroll County, Ohio

- Cleveland State University Shale Development Dashboard Study
- PricewaterhouseCoopers (PwC) Impacts of the Oil and Natural Gas Industry on the US Economy in 2021
- OOGA Sustainability Report

4-1-2023

Shale Investment Dashboard in Ohio Q1 and Q2 2022

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Samuel Owusu-Agyemang

Seeberg Shelbie

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Levin College of Public
Affairs and Education

Prepared for:
JOB SOHIO

Prepared by:
Andrew R. Thomas
Mark Henning
Samuel Owusu-Agyemang
Shelbie Seeberg

April 2023

**SHALE INVESTMENT
DASHBOARD IN OHIO
Q1 AND Q2 2022**

**Energy Policy
Center**

1717 Euclid Avenue Cleveland, Ohio 44115
<http://urban.csuohio.edu>

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Executive Summary

This report presents findings from an investigation into shale-related investment in Ohio. The investment estimates are cumulative from January through June of 2022. Prior investments have been included in previous reports that are available from Cleveland State University.¹ Subsequent reports will estimate additional investment since the date of this report. Investment in Ohio into the Utica during the first half of 2022 can be summarized as follows:

Total Estimated Upstream Utica Investment: January – June 2022

Lease Renewals and New Leases	\$71,628,000
Drilling	\$922,080,000
Roads	\$13,432,310
Lease Operating Expenses	\$178,628,486
Royalties	\$1,585,438,000
Total Estimated Upstream Investment	\$2,771,206,796

Total Estimated Midstream Investment: January – June 2022

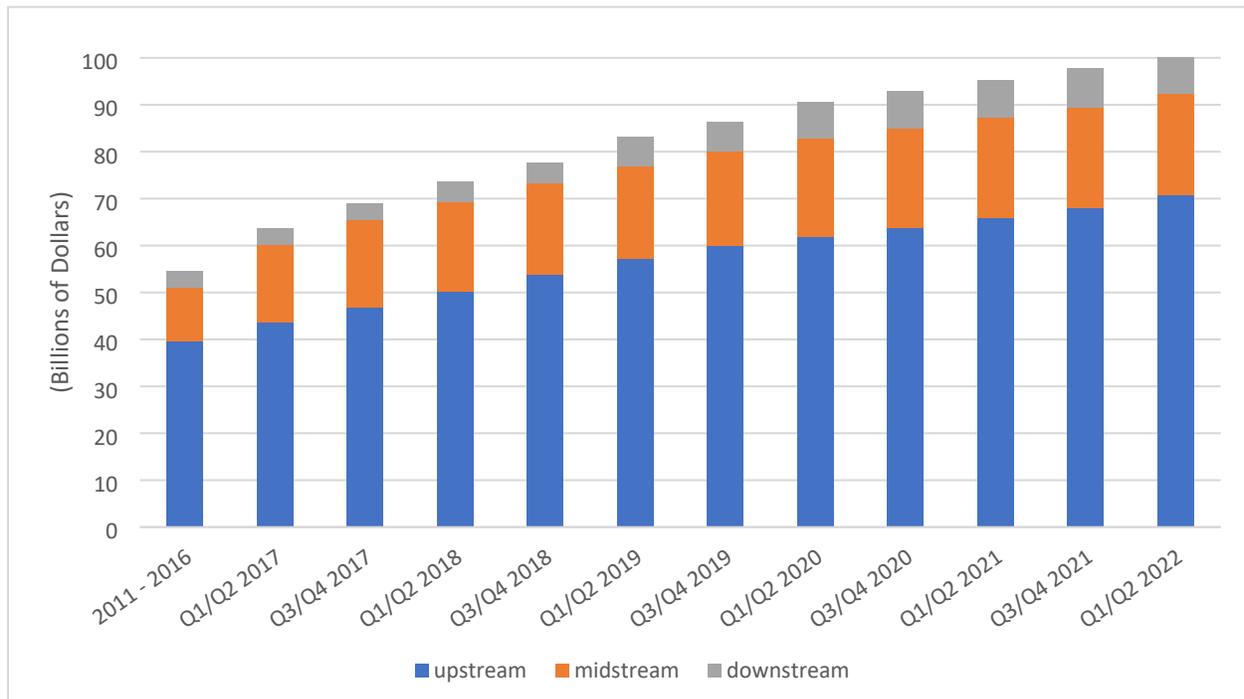
Gathering Lines	\$18,048,000
Gathering System Compression and Dehydration	\$12,783,000
Rail Transloading Facilities	\$5,270,000
Transmission Line Interconnect	\$1,000,000
Total Estimated Midstream Investment	\$37,101,000

Total investment from January through June 2022 was approximately \$2.8 billion, including upstream and midstream. There was no significant Ohio investment in downstream oil and gas industries in the first half of 2022, as we have defined it for this Study. Indirect downstream investment, such as development of new manufacturing as a result of lower energy costs, was not investigated as part of this Study. Together with previous investment to date, cumulative oil and gas investment in Ohio through June of 2022 is estimated to be around \$100.6 billion. Of this, \$70.8 billion has been in upstream, \$21.5 billion in midstream, and \$8.3 billion in downstream industries.² Figure 1 shows the growth in cumulative shale-related investment for Ohio since the release of the first Shale Dashboard.

¹ The twelve previous reports on shale investment in Ohio up to December 2021 can be found at https://engagedscholarship.csuohio.edu/urban_enpolc/

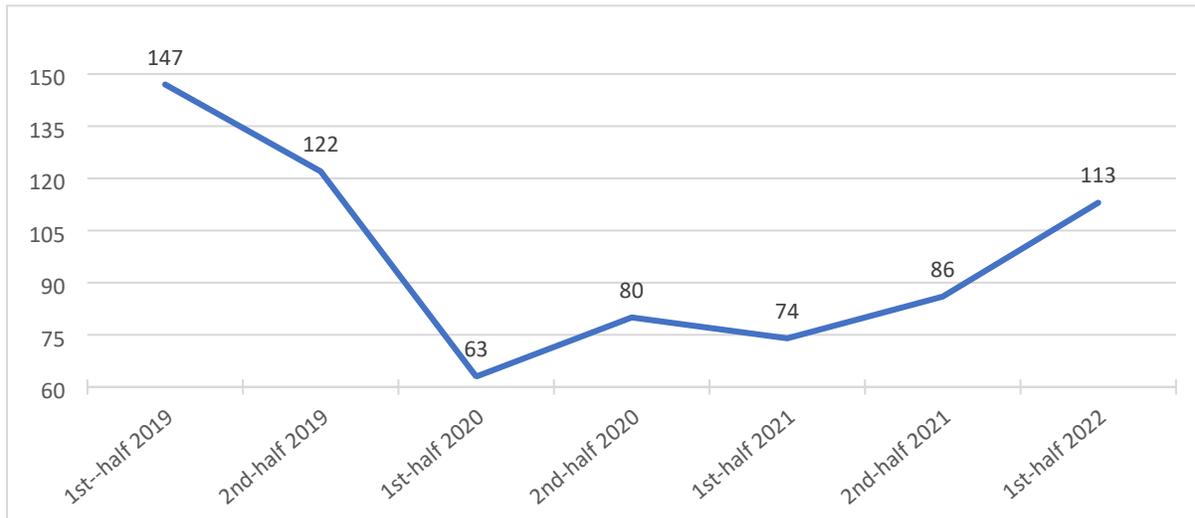
² Numbers may not add up precisely due to rounding.

Figure 1: Cumulative Shale Investment in Ohio Over Time



Overall upstream investments were up by about \$628 million in the first half of 2022 compared to the second half of 2021, reflecting both higher royalty earnings and an increase in new wells drilled due to higher oil & gas prices. See Figure 2 for the change in new shale wells drilled in Ohio by 6-month period since 2019. As determined from Ohio Department of Natural Resources Division of Oil and Gas (ODNR) data for shale well drilling, 113 new wells were drilled during the first and second quarters of 2022, 27 more than the number drilled in the second half of 2021. ODNR production data also indicated that the total volume of gas-equivalent shale production in the first half of 2022 was 2.7% less than overall production in the second half of 2021. (Production volumes have consistently been stronger in the second half of the year since the advent of the Shale Investment Dashboard). Jefferson County had the highest number of new wells with 27, followed by Harrison County with 20 new wells, Carroll County with 19 new wells, and Monroe County with 16 new wells. Belmont and Guernsey Counties had 14 and 10 new wells, respectively. No other county had more than 10 new wells drilled for the first half of 2022.

Figure 2: New Shale Wells in Ohio by 6-month Period



Data Source: ODNR (2023).

Ascent and EAP Ohio were the top producers for Q1 and Q2 of 2022, having produced 417 and 197 billion cubic feet equivalent (Bcfe), respectively. Gulfport was third in production at 158 Bcfe. SWN Production (Southwestern) and Rice Drilling produced 121 Bcfe and 82 Bcfe, respectively.³ Antero had the sixth highest production during the Study period at 60 Bcfe. These six companies represented a little over 91% of total production in Ohio for the first half of 2022.

EOG Resources announced the establishment of a 395,000 net-acre position in the Ohio Utica during the second half of 2022, making it one of the largest leaseholders in the play within the state.⁴ The acquisition—totaling around \$500 million—included 135,000 mineral acres in the southern part of the Ohio Utica (e.g., Guernsey and Noble Counties).⁵ The company expects to develop 20 wells throughout its newly acquired Utica acreage footprint in 2023.

The first half of 2022 saw midstream investment of \$37.1 million, around half the spending for this segment compared to the previous 6-month period. The majority of midstream investment during the Study period (\$30.8 million) was for gathering system buildout. However, \$5.3 million was also spent on a propane rail terminal in Sycamore in the northwestern part of the state, supplied primarily by rail cars from regional shale plays.⁶ A further \$1 million was spent on a pipeline interconnection to allow for the delivery of natural gas supplies from the Rover Pipeline

³ SWN Production's Utica assets include wells formerly belonging to Eclipse and Montage Resources.

⁴ See EOG's November 3, 2022 report on quarterly earnings.

https://s24.q4cdn.com/589393778/files/doc_financials/2022/q3/3Q-2022-Earnings-Press-Release-with-Tables.pdf

⁵ *Id.* The acquisition is not included as an upstream investment in this Study because it is assumed that the acreage is not newly leased, and had been accounted for in previous reports estimating bonus payments. EOG's 10-K report does not identify new leases in its acreage, but if this information becomes available, the bonuses will be added to future reports.

⁶ LP Gas Magazine. (2022, February 28). *NGL Supply Co. Ltd. opens Ohio Rail Terminal.*

<https://www.lpgasmagazine.com/ngl-supply-co-ltd-opens-ohio-rail-terminal/>

system to the North Coast Gas Transmission system along NCGT's existing Toledo-to-Marion intrastate pipeline.⁷ Future midstream investment will include Ohio's share of the \$161 million Ohio Valley Connector Expansion project to increase takeaway capacity out of the region, which was actively under development as of March 2023.⁸

There were no significant downstream investments during the first half of 2022. However, sitework has recently begun on the \$1.2 billion natural gas-fired Trumbull Energy Center near Lordstown. Also, construction on a second natural gas-fired power plant in Oregon, OH is planned to commence in the coming year. Natural gas-based hydrogen projects—such as the \$1.6 billion advanced hydrogen clean energy manufacturing facility under development at the site of the DOE's former Portsmouth Gaseous Diffusion Plant near Piketon—will present additional downstream opportunities in the next few years. These and other investments—including the buildout of fueling infrastructure for CNG, LPG, LNG, and hydrogen-powered vehicles—will be included in future Dashboard reports.

1. INTRODUCTION

This is the thirteenth CSU study reporting investment resulting from oil and gas development in Ohio related to the Utica and Point Pleasant formations (hereinafter, the "Utica").⁹ This analysis looks at investments made in Ohio between January 1 and June 30, 2022, separately considering the upstream, midstream, and downstream portions of the industry. For the upstream part, the Study Team estimated spending primarily based upon the likely costs of drilling new and operating existing wells, together with royalties and lease bonuses.

For midstream estimates, the Study Team looked at new infrastructure built during the relevant time period downstream of production, from gathering to the point of hydrocarbon distribution. This included pipelines, processing, natural gas liquid storage, and intermodal transloading facilities.

For the downstream analysis, the Study Team considered those industries that directly consume large amounts of oil, natural gas or natural gas liquids. Since hydrocarbon consumption may or may not be related to shale development, the examination of downstream investment has been limited to those projects that have been deemed by the Study Team to be dependent on, or directly the result of, the large amount of oil and gas being developed in the region as a result of the Marcellus and Utica shale formations.

⁷ See Energy Information Administration. (January 2023). *U.S. Natural Gas Pipeline Projects*. https://www.eia.gov/naturalgas/pipelines/EIA-NaturalGasPipelineProjects_Jan2023.xlsx

⁸ See FERC Docket No. CP22-44. (2023, March 23). *Equitrans, L.P. submits Response to FERC's March 21, 2023, Data Request re the Application for a Certificate of Public Convenience and Necessity for the Ohio Valley Connector Expansion Project under CP22-44*. <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=ECD4D7F4-474C-CF37-9C02-870FD8400000>

⁹ This and other Investment Dashboard reports include drilling into the Marcellus and other shale units, but these comprise a very small portion of shale development in Ohio to date. This will be revisited as necessary in future iterations of the Investment Dashboard reports.

This thirteenth Study includes as Appendix A the cumulative investment made in Ohio resulting from shale development, based upon all previous reports that tracked total investment from early 2011 through June 2022.¹⁰ The methodology for determining the investments is set forth in Appendix B, and has been updated since the last report. Subsequent reports will include incremental spending on a six-month basis.

2. SHALE INVESTMENT UPDATES

A. UPSTREAM DEVELOPMENT

1. Overview.

A total of 113 new wells were listed by the Ohio Department of Natural Resources as “drilled,” “drilling,” or “producing” during the period of January 1 to June 30, 2022.¹¹ This represents a 31.4% increase in new well development compared to the second half of 2021. The total number of production wells in the Utica was 2,886 on June 30, 2022, a 3.4% increase from the end of December 2021. Total shale-related oil and gas production in billion cubic feet equivalent (Bcfe) for this period was 1,135 Bcfe, led by Belmont County with 306 Bcfe. Jefferson County was second with 284 Bcfe, followed by Monroe County with 229 Bcfe.¹²

The Ohio Department of Natural Resources (ODNR) Division of Oil and Gas Resources Management issues weekly reports on well status and quarterly reports on production. The ODNR production reports for the first and second quarters of 2022 provide the foundation for the upstream analyses presented in this Study.

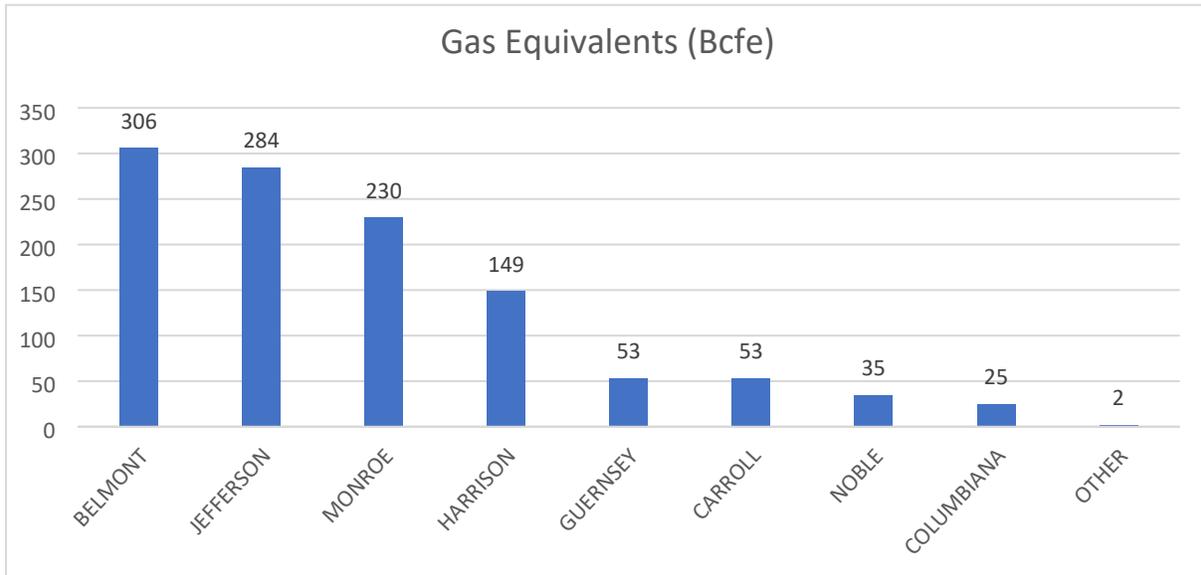
The Utica is currently identified by the ODNR as producing in eighteen eastern Ohio counties with the vast majority (over ninety-eight percent) of producing wells located in eight counties, stretching from Columbiana in the north, to Monroe and Noble at the southern end of the play. Total production in quarters 1 and 2 for 2022 is set forth by county and operator in Figures 3 and 4 below. Total cumulative production in billions of cubic feet equivalent (Bcfe) by county and by operator through June 2022 can be found in Appendix A as Figures 10 and 11.

¹⁰ See *fn 1, supra*.

¹¹ The number of new wells was determined using ODNR Cumulative Permitting Activity reports for the beginning and end of the 6-month period (see <http://oilandgas.ohiodnr.gov/shale>). Wells are assigned an American Petroleum Institute API number, which is included in the ODNR reports. Wells were considered new if they had a status of drilled, drilling, or producing at the end of the 6-month period but did not have any one of these status designations at the beginning of it.

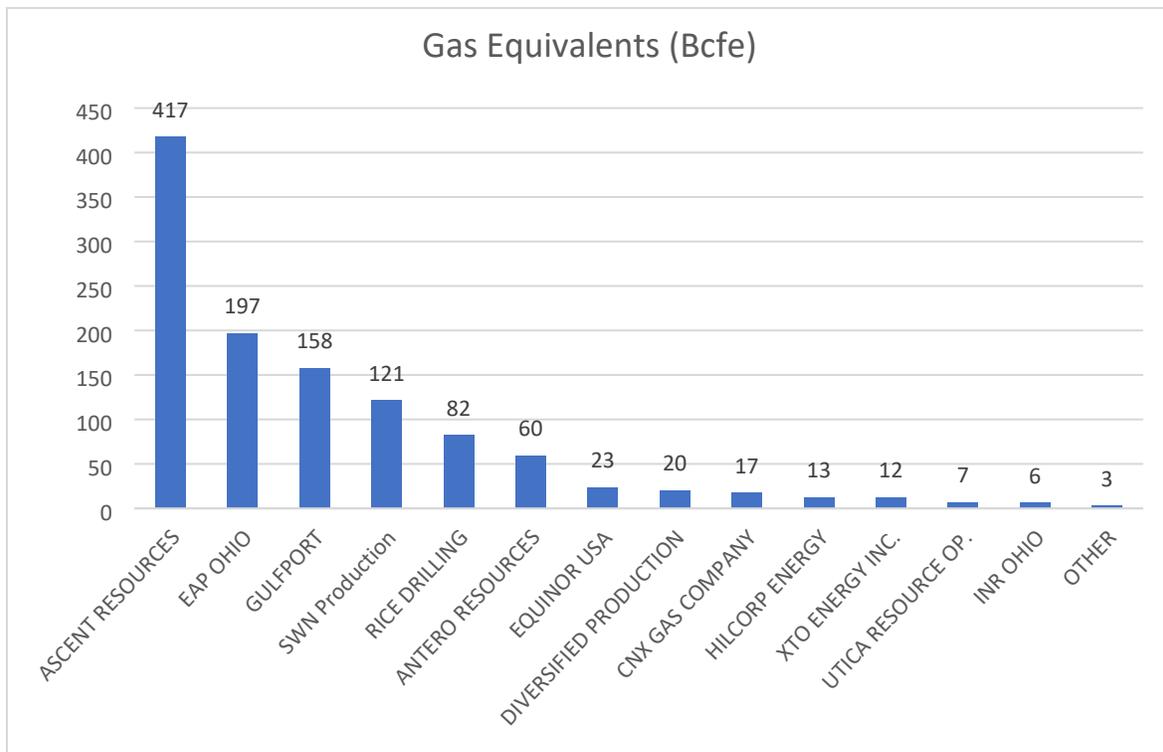
¹² Production is reported to the ODNR at the wellhead as gas measured in thousands of cubic feet (Mcf) and as oil measured in barrels (bbl). The Utica also produces significant volumes of natural gas liquids (NGLs) such as ethane, propane, butane and natural gasoline. These NGLs are separated from the natural gas stream at midstream cryogenic and fractionation plants and not included in the ODNR production reports. For the purposes of this Study, oil and gas production is combined as gas equivalents (Mcf) based on the energy content of oil and gas, measured as British thermal units (Btu). Gas equivalents were calculated using the following formula: Gas Equivalents (Mcf) = Oil (bbl) x 5.659 Mcf/bbl + Gas (Mcf).

Figure 3: Production by County for Q1 and Q2 of 2022



Data Source: ODNR (2023).

Figure 4: Production by Operator for Q1 and Q2 of 2022



Data Source: ODNR (2023).

2. Production Analysis.

Production can be summarized using tables that show gas equivalent production measured in billions of cubic feet equivalent as a function of time. This summary, for both production in the first and second quarters of 2022, and also for cumulative production since 2011, is set forth in Table 1. Table 2 sets forth production by county for the first half of 2022. Figure 5 sets forth the geographic distribution of production for the same period.

Table 1: Ohio's Shale Production by Reporting Period

Year	Quarter	Production Wells	Gas (Mcf)	Oil (bbl)	Gas Equivalents (Mcf)	Gas Production (% Change from Previous Quarter)
2022	2	2,921	543,019,311	5,018,523	571,419,133	1.3
2022	1	2,850	541,815,020	3,957,294	564,209,347	-5.8
2021	4	2,817	576,496,677	3,912,593	598,638,041	5.2
2021	3	2,764	547,540,443	3,781,319	568,938,927	-0.6
2021	2	2,805	549,211,398	4,154,041	572,332,375	-0.2
2021	1	2,752	548,129,151	4,543,462	573,417,606	-6.4
2020	4	2722	586,878,969	4,625,639	612,624,813	-1.3
2020	3	2688	588,630,465	5,713,477	620,431,107	3.6
2020	2	2643	569,396,136	5,182,481	598,723,796	-2.6
2020	1	2573	581,634,083	5,887,032	614,948,797	-14.1
2019	4	2524	677,685,505	6,818,682	716,272,426	0.2
2019	3	2470	673,962,146	7,200,304	714,708,666	10
2019	2	2365	614,218,362	5,813,755	647,118,402	1.4
2019	1	2277	609,452,391	5,073,536	638,163,531	-8.4
2018	4	2201	663,534,323	5,810,484	696,415,852	9.3
2018	3	2198	605,716,125	5,545,536	637,098,313	9.9
2018	2	2002	554,306,916	4,488,104	579,705,097	4.7
2018	1	1906	531,291,017	3,942,251	553,600,215	5.1
2017	4	1866	503,066,907	4,193,562	526,784,387	8.7
2017	3	1769	460,844,826	4,207,674	484,656,053	18.1
2017	2	1646	387,725,175	4,019,281	410,512,053	4.7
2017	1	1530	369,913,713	3,877,717	391,904,993	2.5
2016	4	1492	362,107,422	3,568,077	382,364,866	-0.2
2016	3	1442	360,681,356	3,954,095	383,057,580	5.9
2016	2	1382	334,257,982	4,839,792	361,646,365	0.3
2016	1	1328	329,537,838	5,485,854	360,582,286	7.0
2015	ANNUAL	1248	923,908,838	20,698,159	1,041,039,721	--
2014	ANNUAL	810	449,966,930	10,893,625	511,613,948	--
2013	ANNUAL	371	99,050,302	3,635,419	119,623,141	--
2012	ANNUAL	82	12,831,292	635,874	16,429,703	--
2011	ANNUAL	9	2,561,524	46,326	2,823,683	--
Total			15,159,372,543	161,523,968	16,071,805,223	--

Source: ODNR (2023).

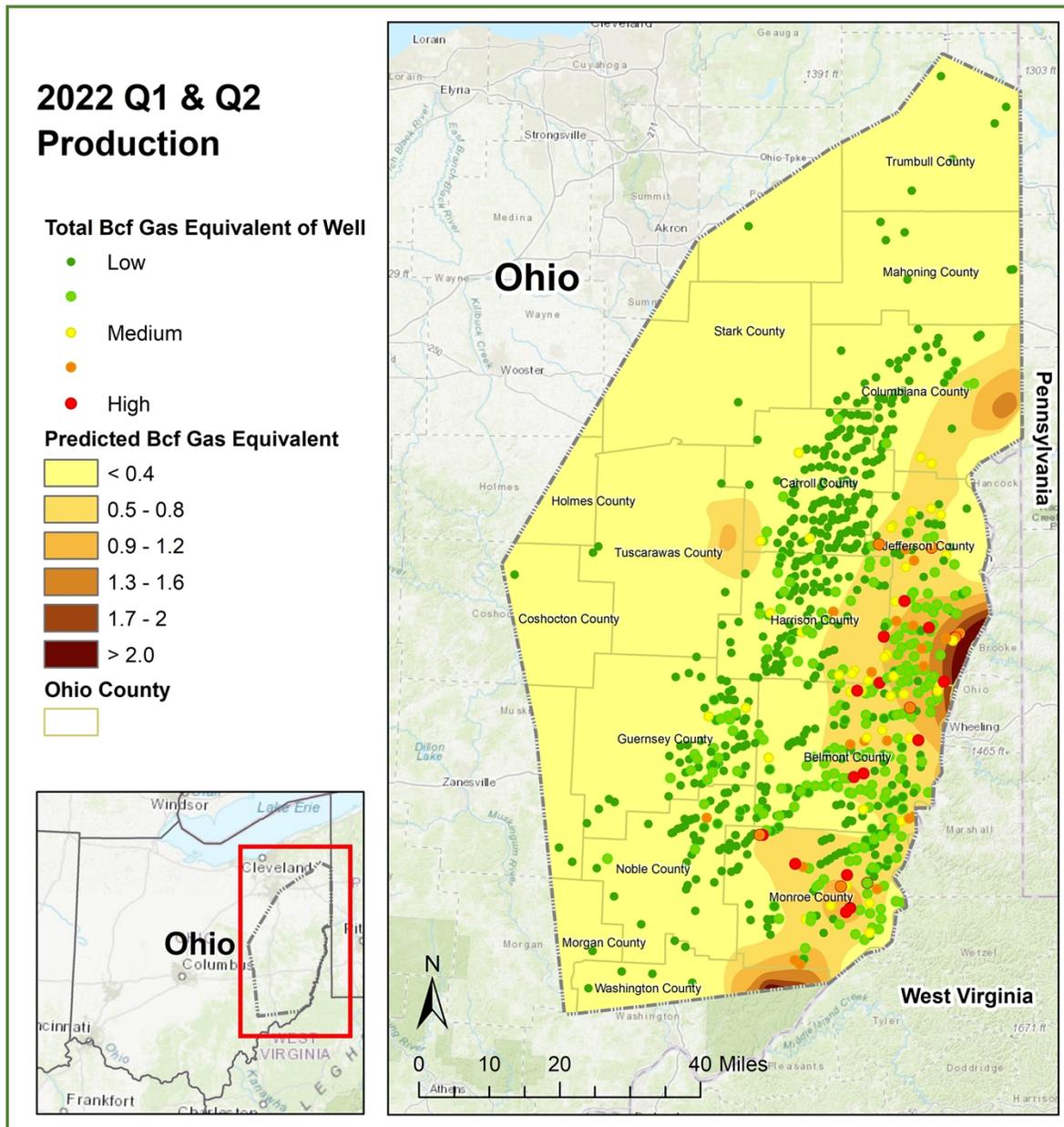
Table 2: Production by County for January – June 2022

County	Gas (Mcf)	Oil (bbl)	Gas Equivalents (Mcf)	Production Wells ¹³
BELMONT	305,379,996	75,695	305,808,354	622
CARROLL	41,833,417	1,983,197	53,056,329	487
COLUMBIANA	24,449,114	11,373	24,513,474	97
COSHOCTON	10,643	-	10,643	1
GUERNSEY	33,066,391	3,570,244	53,270,402	261
HARRISON	134,022,843	2,573,892	148,588,498	463
JEFFERSON	284,203,720	70	284,204,116	311
MAHONING	453,958	2,875	470,228	11
MONROE	228,717,672	138,381	229,500,770	429
MORGAN	59,218	2,144	71,351	2
MUSKINGUM	257,604	7,386	299,401	2
NOBLE	31,214,208	597,379	34,594,776	176
PORTAGE	28,603	129	29,333	2
STARK	28,059	327	29,909	1
TRUMBULL	168,823	971	174,318	6
TUSCARAWAS	144,343	6,625	181,834	5
WASHINGTON	772,761	5,049	801,333	11
WAYNE	22,958	80	23,411	1
Total	1,084,834,331	8,975,817	1,135,628,479	2,886

Source: ODNR (2023).

¹³ Represents the average number of production wells for the first and second quarters of 2022.

Figure 5: Distribution of Gas Equivalent Production for January – June 2022



Of the 3,118 total wells identified from the ODNR records for cumulative drilling activity as of June 2022, 165 were in the process of drilling, 77 wells had been drilled and were awaiting markets, and 2,876 were in the production phase.¹⁴ (See Table 3, Ohio Utica Well Status.) Belmont County continued to lead in total wells (see Table 4).

¹⁴ The discrepancy between the number of “Producing” wells in Table 3 and “Production” wells in Table 2 is due to how wells are reported in the ODNR’s *Shale Well Drilling & Permitting* and *Well Production* spreadsheets. For a particular point in time, a given well may be classified as non-producing in the spreadsheet for cumulative activity yet have a record of production in the well production spreadsheet.

Table 3: Ohio Utica Well Status as of June 2022

Well Status	No. of Wells
Drilled	77
Drilling	165
Producing	2,876
Total	3,118

Source: ODNR (2022)

Table 4: Well Status by County (June 2022)

County	Drilled	Drilling	Producing	Total
BELMONT	15	26	625	666
CARROLL	2	22	493	517
HARRISON	3	30	460	493
MONROE	19	12	400	431
JEFFERSON	1	35	320	356
GUERNSEY	3	15	260	278
NOBLE	1	6	174	181
COLUMBIANA	13	17	97	127
MAHONING	1	0	12	13
TRUMBULL	3	1	7	11
WASHINGTON	0	0	11	11
PORTAGE	6	1	2	9
TUSCARAWAS	2	0	7	9
STARK	4	0	2	6
COSHOCTON	1	0	1	2
MORGAN	0	0	2	2
MUSKINGUM	0	0	2	2
ASHLAND	1	0	0	1
KNOX	1	0	0	1
MEDINA	1	0	0	1
WAYNE	0	0	1	1
Total	77	165	2,876	3,118

B. UPSTREAM INVESTMENT ESTIMATES

Upstream investments have been broken down into four areas: investments into drilling, including road construction associated with well development; lease operating (post-production) expenses; new lease and lease renewal bonuses; and royalties on hydrocarbon production. The methodology used for each calculation is set forth in Appendix B. Average drilling costs were updated for this study, based upon reports from publicly traded operating companies. Previous shale reports differentiated between northern and southern counties with respect to drilling costs based on the greater vertical depths and horizontal lengths of wells developed in southern counties, on average. However, a recent review of ODNR drilling surveys indicated that there is no longer a significant difference in average well depth and horizontal length between northern and southern counties. Based on an average lateral length of 13,600 ft. for the eight most active shale-producing counties in Ohio over the last two years, and average drilling and completion costs of \$600 per lateral foot for operators in the Utica during 2022, we assumed an average drilling cost of \$8.2 million per well for *all* horizontal wells.¹⁵

This section covers upstream investments between January and June 2022. Cumulative upstream investments to date in Ohio, including 2011 through the first half of 2022, are set forth in Table 17 of Appendix A.

1. Investments into Drilling.

The following tables set forth estimated investments for the Study period made into drilling shale wells in Ohio. Jefferson County was the leader in new upstream investment, with 27 new wells and an investment of around \$223.5 million between January and June 2022. Harrison and Carroll counties were second and third, with 20 and 19 new wells, and approximately \$165.6 million and \$157.3 million invested, respectively. (See Table 5). Road-related investments for this version of the Shale Investment Dashboard reflect average road costs per well determined from three sources: The Ohio Oil and Gas Association's (OOGA) 2017 report *Ohio's Oil & Gas Industry Road Improvement Payments*; OOGA's 2022 *Community Impact/Sustainability Report*; and spending in 2021 on Road Use Maintenance Agreements (RUMAs) by companies in Monroe, Noble, and Carroll Counties as reported to the Study Team by the engineer's office for those counties.¹⁶ Based on information from these sources, road costs related to drilling were assumed to be \$118,870 per well.

¹⁵ See Upstream Methodology in Appendix B.

¹⁶ OOGA's 2017 report indicated that oil and gas companies in Ohio had spent approximately \$300 million on roads from 2011 through 2017. OOGA's 2022 report indicated that cumulative spending by the industry on roads had reached approximately \$400 million by the end of 2021. This suggests that \$100 million was spent on roads from 2018 through 2021. The Study Team has tracked 846 new wells over that period for the bi-annual shale dashboards. This suggests an average expenditure per well on roads of around \$118,200. Independent of this estimate, the 2021 RUMA-based improvement totals as gathered by the engineer's office in Monroe, Noble, and Carroll counties and shared with the Study Team tallied about \$3.825 million. Based on the 32 new wells the Study Team tracked for those three counties last year, this comes out to \$119,500 per well. The two estimates were averaged and rounded to the nearest \$1,000 to yield the rule of thumb for spending on roads.

Ascent was the leading operator-investor during the six-month period, with 51 new wells and an estimated \$422.2 million. EAP Ohio recorded the second highest investment, with 32 new wells and an estimated \$264.9 million investment. Gulfport Appalachia and SWN Production invested \$91.1 million and \$82.8 million in 11 and 10 wells, respectively. (See Table 6.)

Table 5: Estimated Upstream Shale Investment by County, January – June 2022

County	No. of New Wells	Drilling (\$)	Roads (\$)	Total Amount (\$)
JEFFERSON	27	\$220,320,000	\$3,209,490	\$223,529,490
HARRISON	20	\$163,200,000	\$2,377,400	\$165,577,400
CARROLL	19	\$155,040,000	\$2,258,530	\$157,298,530
MONROE	16	\$130,560,000	\$1,901,920	\$132,461,920
BELMONT	14	\$114,240,000	\$1,664,180	\$115,904,180
GUERNSEY	10	\$81,600,000	\$1,188,700	\$82,788,700
COLUMBIANA	7	\$57,120,000	\$832,090	\$57,952,090
Total	113	\$922,080,000	\$13,432,310	\$935,512,310

Source: The Authors (2023)

Table 6: Estimated Upstream Shale Investment in Ohio by Company, January – June 2022

Operators	No. of Wells	Drilling (\$)	Roads (\$)	Total Amount (\$)
ASCENT RESOURCES UTICA LLC	51	\$416,160,000	\$6,062,370	\$422,222,370
EAP OHIO LLC	32	\$261,120,000	\$3,803,840	\$264,923,840
GULFPORT APPALACHIA LLC	11	\$89,760,000	\$1,307,570	\$91,067,570
SWN Production (Ohio) LLC	10	\$81,600,000	\$1,188,700	\$82,788,700
ANTERO RESOURCES CORPORATION	3	\$24,480,000	\$356,610	\$24,836,610
INR OHIO LLC	2	\$16,320,000	\$237,740	\$16,557,740
DIVERSIFIED PRODUCTION LLC	2	\$16,320,000	\$237,740	\$16,557,740
EOG RESOURCES INC.	1	\$8,160,000	\$118,870	\$8,278,870
ECLIPSE RESOURCES I LP	1	\$8,160,000	\$118,870	\$8,278,870
Total	113	\$922,080,000	\$13,432,310	\$935,512,310

Source: The Authors (2023)

2. Lease Operating Expenses.

Post-production investments have been estimated on a half-year basis, assuming an average cost of \$0.16/Mcf-equivalent.¹⁷ This estimate is based upon recent operator reports.¹⁸ These investments are set forth below. Belmont County and Jefferson County led the lease operating expense investment, with an estimated \$48.2 million and \$44.8 million invested, respectively.

Table 7: Estimated Lease Operating Expenses for January – June 2022 by County

County	Gas Equivalents (Mcf)	Lease Operating Expense for Period
BELMONT	305,808,354	\$48,164,816
JEFFERSON	284,204,116	\$44,762,148
MONROE	229,500,770	\$36,146,371
HARRISON	148,588,498	\$23,402,688
GUERNSEY	53,270,402	\$8,390,088
CARROLL	53,056,329	\$8,356,372
NOBLE	34,594,776	\$5,448,677
COLUMBIANA	24,513,474	\$3,860,872
OTHER	2,091,761	\$329,452
TOTAL	1,135,628,479	\$178,861,486

Table 8: Estimated Lease Operating Expenses for January – June 2022 by Operator

Operator	Gas Equivalents (Mcf)	Lease Operating Expense for Period
ASCENT RESOURCES UTICA LLC	417,368,330	\$65,735,512
EAP OHIO LLC	196,715,703	\$30,982,723
GULFPORT APPALACHIA LLC	157,766,273	\$24,848,188
SWN Production (Ohio) LLC	121,156,362	\$19,082,127
RICE DRILLING D LLC	82,116,624	\$12,933,368
ANTERO RESOURCES CORPORATION	59,599,195	\$9,386,873
EQUINOR USA ONSHORE PROP.	23,149,858	\$3,646,103
DIVERSIFIED PRODUCTION LLC	19,980,685	\$3,146,958
CNX GAS COMPANY LLC	17,239,710	\$2,715,254
HILCORP ENERGY COMPANY	12,617,967	\$1,987,330
XTO ENERGY INC.	12,231,081	\$1,926,395
UTICA RESOURCE OPERATING LLC	6,545,532	\$1,030,921
INR OHIO LLC	6,161,178	\$970,386
OTHER	2,979,982	\$469,347
TOTAL	1,135,628,479	\$178,861,486

¹⁷ Previous reports relied on a per-well rule-of-thumb to calculate lease operating expenses, which attributed an equal amount to both low- and high-producing wells. A production-based rule of thumb more accurately captures the expenses that companies are likely to incur while operating wells.

¹⁸ The per-Mcfe rule-of-thumb for lease operating expenses is based on average production costs for Ascent's and Gulfport's Utica operations in the first half of 2022 as reported in quarterly financial statements for both companies. See Appendix B.

3. Royalties.

Royalty investments have been estimated on a per quarter basis, assuming the formulas set forth in Appendix B. Total estimated royalties spent on Ohio properties between January and June 2022 were nearly \$1.6 billion, or about 36% higher than the amount dispersed in the second half of 2021. The breakdown by quarter for oil, residue gas (gas left after extracting liquids) and natural gas liquids is set forth in Tables 9, 10, and 11 below. The average price for natural gas was \$5.51/MMBtu during the first half of 2022, up from \$4.02 in the second half of 2021.¹⁹ Regional oil prices increased from an average of \$84.54/bbl during the first quarter of 2022 to \$98.71/bbl for the second quarter.²⁰ For comparison, regional oil prices averaged \$60.02 and \$67.11 per barrel in the third and fourth quarters of 2021, respectively.

Table 9: Total Royalties from Oil, January – June 2022 (in millions)

Year	Quarter	Oil Price \$/bbl	Oil Royalty (20%) \$/bbl	Royalty (\$mm)
2022	2	\$98.71	\$19.74	\$99.08
2022	1	\$84.54	\$16.91	\$66.91
			Subtotal	\$165.99

Table 10: Total Royalties from Residue Gas, January – June 2022 (in millions)

Year	Quarter	Residue Gas Price \$/Mcf	Residue Gas Royalty (20%) \$/Mcf	Royalty (\$mm)
2022	2	7.53	\$1.51	\$719.82
2022	1	4.58	\$0.92	\$437.20
			Subtotal	\$1,157.02

Table 11: Total Royalties from Natural Gas Liquids, January – June 2022 (in millions)

Year	Quarter	NGL Price \$/bbl	NGL Royalty (20%) \$/bbl	Royalty (\$mm)
2022	2	29.61	5.92	\$141.51
2022	1	25.36	5.07	\$120.93
			Subtotal	\$262.43

¹⁹ Reflects average natural gas prices over the respective periods across the Columbia Gas, Eastern Gas South, and Texas Eastern M-2 trading hubs as derived from Intercontinental Exchange (ICE) trade data published in regular weekly market reports by Snyder Brothers Gas Marketing. See <https://www.snyderbrothersinc.com>.

²⁰ Reflects average prices reported by Ergon for Marcellus-Utica light crude (<https://ergon.com>). See Appendix B.

4. Lease Renewals and New Leases.

New leases and lease renewal investments have been estimated for the Utica region based upon the drilling activity of the top six drilling companies in the region. These six companies have together drilled over 88% of the Utica wells to date, and it is assumed that they likewise control over 88% of the leases. The estimated investments into new leases and lease renewals are set forth below in Table 12.

There are several potential sources of error in these estimates. Because operators do not report lease bonus information, the Study Team was required to estimate investments into lease bonuses based upon some industry rules of thumb, together with information found in public leases. One important rule of thumb we deployed in estimating lease bonus investment is that “primary” lease terms average about 5 years. The primary term is that period of time during which the operator may conduct drilling operations but hold the lease without producing. Once a lease is drilled and production begins, the lease moves into its “secondary term,” and may be thereafter “held by production” (HBP) for the life of that production. Using this rule of thumb, we determined that each operator will, on average, every year replace about 20% of its undeveloped acreage that is not HBP.

However, it is possible to hold undeveloped acreage without producing it. This can be done through the process of unitization. An operator may, for instance, have a 750-acre unit that is designed to drain a reservoir by 3 wells draining 250 acres each. The operator may drill the first well and begin to pay royalties therefrom to all the unit leases, thereby moving all the unit leases into HBP status, even though only one third of the reservoir is actually producing. Under this scenario, 500 acres would be classified as “undeveloped acreage,” while 250 acres would be “developed acreage.”

Most operators report undeveloped acreage.²¹ However, they generally do not distinguish what portions of their undeveloped acreage are HBP or under primary term. Some do, however, report what percentage of their overall acreage is HBP, and this number can be used to estimate the likely acreage of leases that required bonuses. Based on the most recent annual financial reports for Antero, Ascent, and Gulfport, the Study Team found that on average 14% of a Utica operator’s net Utica acreage was not classified as “Held-By-Production.” Accordingly, for purposes of this Study, and using the 5-year primary term assumption, we assumed that operators, on average, paid lease bonuses on 20% of such non-HBP acreage for the year (i.e. ~3% of the total net acreage), and 10% over the half-year Study period.

Another important assumption is the lease bonus rate. For this Study, we have assumed bonuses to average \$5000/acre lease for renewals and new leases. From 2013-2019, this was a pretty

²¹ *Undeveloped acreage* is defined by operators as that acreage on which wells have not been drilled or completed to a point that would permit the production of economic quantities of oil and natural gas regardless of whether the acreage contains proved reserves. Accordingly, undeveloped acreage can have a wide range of meaning, ranging from highly speculative to proven. Operators use a different, more rigorous classification system to account for proven or potential reserves.

conservative number in the Utica, and therefore likely to still be conservative for renewals of older leases. There is evidence that in 2020 new lease bonus rates were depressed due to sustained low natural gas prices. More recent publicly reported information on lease bonuses suggests, however, that \$5000/acre continues to be a reasonable estimate. In May 2022, for example, the Muskingum Watershed Conservancy District leased mineral rights for \$5,500/acre for a 5-year primary term on acreage in Harrison County.²² A more recent bid to drill on state-owned land confirmed this per-acreage bonus estimate, although the primary term was shorter.²³

One additional factor that may make the lease bonus estimate inaccurate is the use of only “net” non-HBP lease acreage data to avoid possible double counting of leases. Operating companies often collaborate on development with non-operators but report only their own portion of the lease. However, bonuses must be paid on the “gross” lease acreage. So long as the non-operators are among the top six operators (which is commonly the case), their own net acreage reports will capture all the acreage. But if they are not, the acreage will not be captured, and the bonuses estimated herein will be under reported.

²² See Muskingum Watershed Conservancy District. (2022, May 20). *MWCD Negotiates Oil and Gas Lease with Encino Energy*. <https://www.mwcd.org/news/2022/05/20/mwcd-negotiates-oil-and-gas-lease-with-encino-energy>

²³ See Cleveland.com. (2023, April 10). *Texas Driller Offers Ohio ‘Potential’ of Nearly \$2 Billion to Frack Salt Fork State Park*. <https://www.cleveland.com/open/2023/04/texas-driller-offers-ohio-potential-of-nearly-2-billion-to-frack-salt-fork-state-park.html>

**Table 12: Total Estimated Investments into New Leases and Lease Renewals
January – June 2022 (in millions)**

Operator	Acreage not held for production ²⁴	Estimated Bonus Investment (\$mm)
ANTERO RESOURCES ²⁵	17,302	\$8.7
ASCENT RESOURCES ²⁶	42,087	\$21.0
EAP OHIO ²⁷	21,802	\$10.9
GULFPORT ENERGY ²⁸	30,077	\$15.0
RICE DRILLING (EQT) ²⁹	17,129	\$8.6
SOUTHWESTERN ENERGY (SWN) ³⁰	14,861	\$7.4
Total	143,257	\$71.6

C. ESTIMATED MIDSTREAM INVESTMENTS

Midstream investment includes natural gas processing and fractionation facilities, including rail and transloading facilities for storing and handling natural gas liquids. Midstream also includes transmission and gathering pipelines, storage facilities, compressor stations (including compressor engines), dehydration units, and generators installed as part of these stations.

Pipeline investments were estimated using mileage and size information from the Public Utilities Commission of Ohio, and cost information from the Interstate Natural Gas Association of America (INGAA). Similarly, compressor station investments were based on estimated cost per unit of power output for the region as obtained from the INGAA. A full description of the methodology can be found in Appendix B.

²⁴ Antero and Southwestern did not distinguish between Ohio, Pennsylvania, and West Virginia acreage for their Appalachia operations in their FY2022 10-K reports. EAP Ohio is privately held and does not release this sort of annual financial report. Gross developed acreage in Ohio for these companies was assumed to be equivalent to the total acreage for their horizontal drilling units in the state, data for which is available through the ODNR's Oil & Gas Well Viewer at <https://gis.ohiodnr.gov/mapviewer/?config=oilgaswells>. For operators who *do* file 10-K reports in which Appalachian acreage is differentiated by state (Ascent, Gulfport, and Rice Drilling), this estimate for gross developed acreage has been within $\pm 10\%$ of the actual amount. Total net acreage for Antero, Southwestern Energy, and EAP Ohio were estimated based on the average ratio of total-net-acres-to-gross-developed-acres in Ohio for Ascent, Gulfport, and Rice Drilling.

²⁵ Fifteen percent of Antero's total net Ohio acreage was assumed to not be held by production as this was the percentage of the company's overall net Appalachian acreage not held by production in FY2022 based on its most recently filed 10-K.

²⁶ Twelve percent of Ascent's total net Ohio acreage was not held by production based on the company's FY2022 Consolidated Financial Statements.

²⁷ See *fn 24, supra*. Approximately 5% of EAP's acreage in Ohio is not held by production (see <https://www.encinoenergy.com/operations>).

²⁸ Sixteen percent of Gulfport's net Ohio acreage was not held by production based on the company's FY2022 10-K.

²⁹ Acreage not held by production was not identified in the FY2022 10-K for Rice Drilling or Southwestern Energy. This percentage was assumed to be 12%, which was the average for Antero, Ascent, EAP Ohio, and Gulfport.

³⁰ *Id.*

Additional investment information was collected from midstream company investor presentations, news reports, and other sources including Ohio EPA permits. Table 13 summarizes midstream investments identified by the Study Team for the first half of 2022. Some costs related to these projects may have occurred outside the six-month window for this study. However, because the investments cannot easily be separated and tracked while construction is ongoing, the investments are treated as though made entirely during the Study period if construction on the project was begun then.

Table 13: Midstream Investments, January – June 2022

Category	Company	Additions to Infrastructure	Total Amount (\$mm)
Gathering System	Cardinal Gas Services (Williams)	<ul style="list-style-type: none"> 0.04 miles of 8.63" pipeline 1.41 miles of 16" pipeline 	\$5.8
	Dominion Energy	<ul style="list-style-type: none"> 2,760 hp of compression at New Cambridge Compressor Station in Guernsey County 	\$12.8
	EOG Resources	<ul style="list-style-type: none"> 3.89 miles of 6.63" pipeline 	\$6.1
	Summit Midstream Partners	<ul style="list-style-type: none"> 1.12 miles of 12.75" pipeline 	\$3.4
	Utica Gas Services (Williams)	<ul style="list-style-type: none"> 1.34 miles of 8.63" pipeline 	\$2.8
Transportation	NGL Supply Co. Ltd. propane rail terminal ³¹	<ul style="list-style-type: none"> 180,000-gallon rail terminal in Sycamore, OH for propane from Utica/Marcellus 	\$5.3
	Rover Pipeline ³²	<ul style="list-style-type: none"> North Coast Interconnect Project for delivery of natural gas supplies to the North Coast Gas Transmission system. 	\$1.0
Total			\$37.1

Source for Gathering Line Mileage and Diameter Data: PUCO Gathering Construction Reports (2023). Numbers may not add up precisely due to rounding.

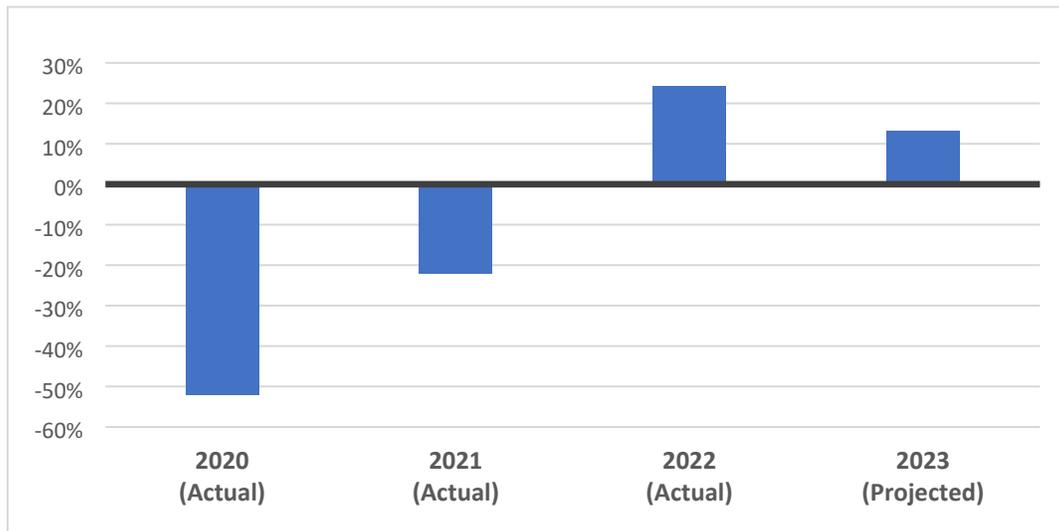
Midstream investments were down 50% during the first half of 2022 compared to the second half of 2021, totaling around \$37 million. Spending for this segment has likely rebounded moderately since the first half of 2022. Figure 6 shows the average annual growth in capital expenditures for midstream companies operating in the Utica based on actual spending since 2019, and projected spending for 2023.³³ (This change in Capex growth reflects operations both inside and outside the Utica for these companies).

³¹ See fn 6, *supra*.

³² See fn 7, *supra*.

³³ Midstream companies whose expenditures were factored into estimating average Capex growth based on available Capex guidance were Antero Midstream, Summit Midstream, Williams, MPLX, Energy Transfer, and Kinder Morgan.

Figure 6: Average Capex Growth for Midstream Operators



The region likely has sufficient near-term gas processing capacity. For example, in 2022 MPLX had about 1.6 Bcf/d of gas processing capacity and 115,000 bpd of fractionation capacity that was underutilized across its Utica and Marcellus operations, representing approximately 25% of the company's design capacity in the region.³⁴

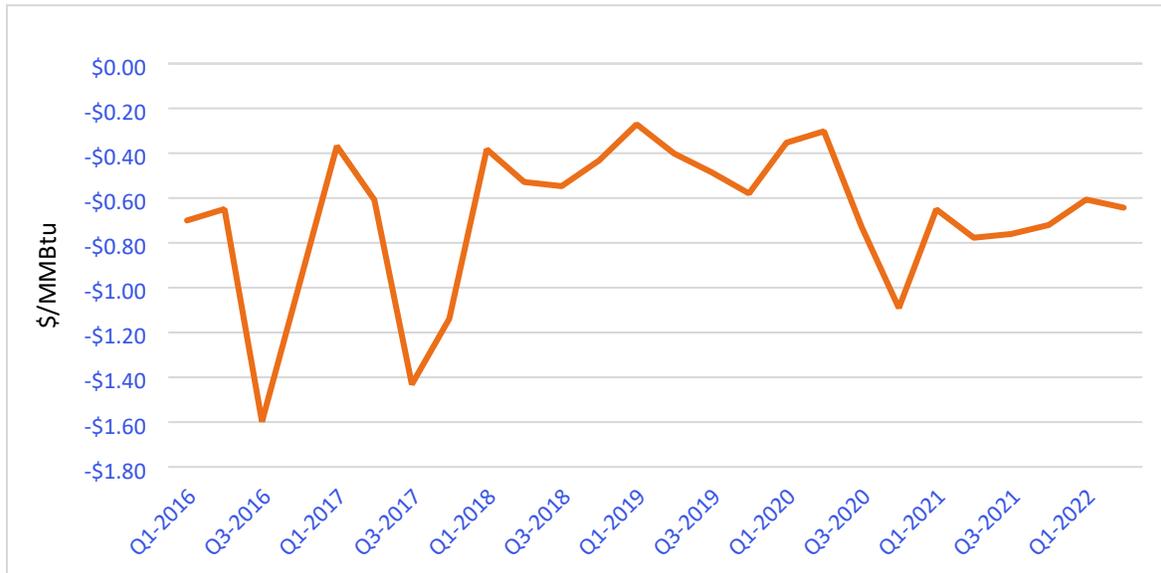
Future midstream investment in Ohio will likely be directed toward pipeline projects to bolster takeaway capacity out of the region. The sustained discount at which regional gas has traded relative to the Henry Hub indicates that a pipeline constraint persists. (See Figure 7). One such project is the \$161 million Ohio Valley Connector Expansion, the purpose of which is to increase the capability (by 350 MMcf/d) to deliver natural gas volumes to mid-continent and Gulf Coast markets along the Rockies Express and Rover pipeline systems.³⁵ The Ohio Valley Connector Expansion project will likely have all required rights of way secured by April 2023, with construction beginning soon thereafter.³⁶ This and other midstream projects to be tracked for future shale reports are listed in Table 14. Cumulative midstream investments through the end of June 2022 are set forth in Table 18 in Appendix A.

³⁴ See MPLX's FY2022 Form 10-K submission to the U.S. Securities and Exchanges Commission. <https://d18rn0p25nwr6d.cloudfront.net/CIK-0001552000/e02cfb18-f2d1-4d28-b38b-1f7dae662c38.pdf>

³⁵ See FERC Docket No. CP22-44. (2022, September 30). *Draft Environmental Impact Statement for Equitrans, LP's Ohio Valley Connector Expansion Project under CP22 44.*

<https://elibrary.ferc.gov/eLibrary/filedownload?fileid=B15F441D-A174-C0E5-8B1C-838EC4300000>

³⁶ See *fn 8, supra*. See also Equitrans Midstream. (n.d.). *Ohio Valley Connector Expansion: Project Schedule.* <https://www.ovcx.info/project-schedule/>

Figure 7. Average Eastern Gas South Trading Margin Compared to Henry Hub³⁷**Table 14: Future Ohio Midstream Projects**

Project	Description	Est. Investment (\$mm)
Ohio Valley Connector Expansion ³⁸	Takeaway capacity out of Appalachia (Ohio portion)	\$19.0
Gathering system buildout ³⁹	2.5 miles of pipeline with avg. diameter of 12.75"; 4,565 hp of compression	\$28.1

D. DOWNSTREAM DEVELOPMENT

1. Combined Heat and Natural Gas Power Plants

Over the past twelve reports, we have noted 10 new natural gas-powered power plants in Ohio that were in the planning, construction, or newly operational stages since 2015. Based on a recent review of EIA data for the six of these plants that are operational, the Study Team estimates that these facilities require around 42,400 mcf annually per MW of installed power

³⁷ See Energy Information Administration. (2023, March 15). *Henry Hub Natural Gas Spot Price*. <https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm>. See also Snyder Brothers Gas Marketing. (2016-2023). *Market Reports* [weekly report that includes ICE settlement prices for natural gas trading hubs in the Appalachian basin]. <https://www.snyderbrothersinc.com>.

³⁸ See fn 35, *supra*.

³⁹ Pipeline estimate reflects construction starts through the end of December 2022 as gathered from the PUCO's Gathering Construction Reports. Compression estimate reflects projects receiving Final Issuance of Permit-to-Install and Operate from Ohio EPA as of December 31, 2022. See Appendix B for methodology used to calculate total dollar amount.

generation capacity on average.⁴⁰ This translates to an estimated 40 Bcf of natural gas consumed annually for a 940 MW power plant.

No new construction starts occurred for plants under development during the first half of 2022. However, in January 2023 tree clearing and site preparation began for the \$1.2 billion, 940 MW Trumbull Energy Center.⁴¹ Investment related to this natural gas-fired power plant will be included in a future shale report.

In September 2022, Clean Energy Future-Oregon, LLC applied for, and was granted by the Ohio Power Siting Board the following month, a one-year extension of its certificate to construct a 955 MW natural gas-fired power plant in Lucas County that would be in addition to the 960 MW one already operational nearby.⁴² This application amendment indicates that construction on the second Oregon, OH plant is planned to commence by October 2023. Construction on the \$1 billion, 1085 MW Harrison Power Plant had not started as of April 2023.⁴³ Meanwhile, construction for the \$1.6 billion, 1875MW Guernsey Power Station—investment for which was included in a previous report—is nearing completion and is planned to conclude in the first half of 2023.⁴⁴

The 10 current and projected natural gas-powered facilities across 8 locations, along with the 106 MW CHP project at Ohio State (investment for which was included in the last Shale Dashboard), are set forth in Figure 8 below.

⁴⁰ See Energy Information Administration. (2023, March 27). *Form EIA-923 Detailed Data with Previous Form Data (EIA-906/920)*. <https://www.eia.gov/electricity/data/eia923>. Form EIA-923 data include monthly and annual fuel consumption and electricity generation at the power plant level. Based on EIA's data for net generation and the PUCO's data for nominal net capacity per facility, Ohio's six operational natural gas-fired power plants developed since 2015 have an average capacity factor of nearly 77%.

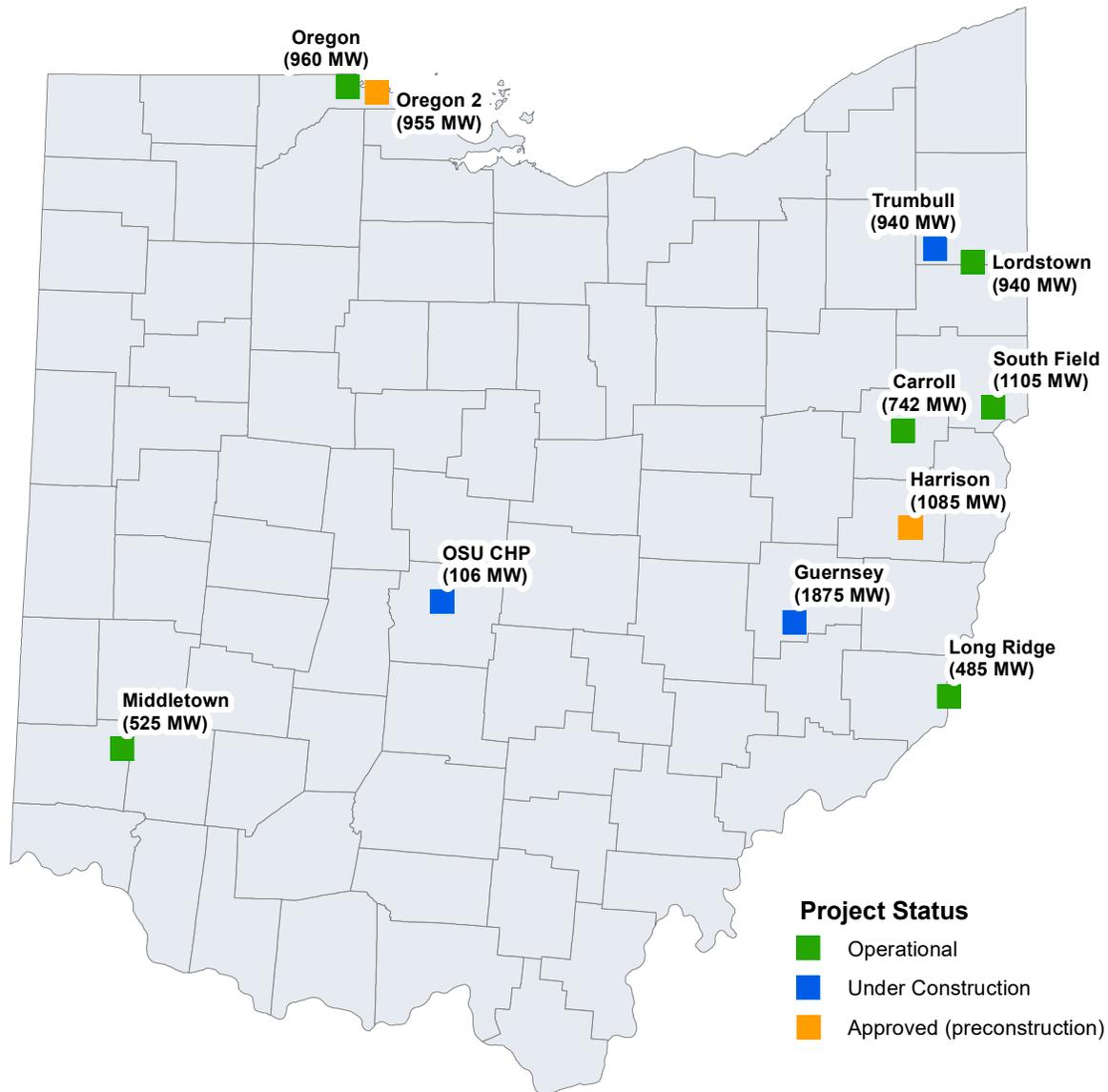
⁴¹ Business Journal Daily. (2023, January 11). *Site Work Begins for Second Power Plant in Lordstown*. <https://businessjournaldaily.com/site-work-begins-for-second-power-plant-in-lordstown>

⁴² PUCO Case Record 22-0826-EL-BGA. (2022). *Application of Oregon Clean Energy Future-Oregon, LLC for a Second Amendment to its Certificate*. <https://dis.puc.state.oh.us/CaseRecord.aspx?CaseNo=22-0826-EL-BGA&x=22&y=20>.

⁴³ No construction notice had been filed with the Ohio Power Siting Board as of this writing.

⁴⁴ PUCO Case Record 16-2443-EL-BGN. (2022). *Compliance Report electronically filed by Mr. Matt Butler on behalf of Staff of OPSB*. <https://dis.puc.state.oh.us/CaseRecord.aspx?CaseNo=16-2443>.

Figure 8: Existing and Projected Natural Gas Power Plants



Source: Ohio Power Siting Board (2023)

2. Other Future Downstream Investment

No significant direct downstream expenditures were identified during the Study Period for other uses of natural gas and NGLs. However, some downstream investments have either occurred since the first half of 2022, or are likely to occur based on recent announcements. These downstream investments to be tracked and included in future shale reports are described herein.

a. Petrochemical

As previously reported, Nutrien plans to expand production capacity of Urea Ammonium Nitrate (a natural gas derivative) beginning in 2023 at its Lima complex as part of \$260 million in spending toward organic growth projects across five North American sites.⁴⁵ Also, Tessengerlo Kerly broke ground in August 2022 on a \$44 million facility in Defiance that will use natural gas as a feedstock to produce the company's range of liquid fertilizers.⁴⁶

b. Transportation

Five public liquefied petroleum gas (LPG) fueling stations opened across the state in January 2023.⁴⁷ Most of these recently opened stations are located at U-Haul self-storage and vehicle rental locations as part of the company's efforts to convert medium and heavy-duty fleets from gasoline and diesel to LPG, also known as Autogas.⁴⁸ Equipment costs for LPG refueling stations range from \$150,000 for medium stations with an 18,000-gallon storage tank, to \$300,000 for large stations with a 30,000-gallon storage tank.⁴⁹

Federal funding opportunities under the Infrastructure Investment and Jobs Act could foster further investment toward refueling infrastructure for vehicles powered by natural gas derivatives. The recently announced Charging and Fueling Infrastructure (CFI) Discretionary Grant Program will provide \$2.5 billion toward alternative fueling infrastructure in publicly accessible locations in urban and rural communities, as well as along designated Alternative Fuel Corridors (see Figure 9 for Alternative Fuel Corridors in Ohio).⁵⁰

Qualifying projects under the CFI program can include natural gas, propane, or hydrogen fueling infrastructures.⁵¹ For projects that place neighborhood-level alternative fueling infrastructure within communities, award amounts will range from a minimum of \$500,000 to a maximum of \$15 million. For projects that place alternative refueling infrastructure along or within close

⁴⁵ Nutrien. (January 2023). *Investor Presentation*. <https://nutrien-prod-asset.s3.us-east-2.amazonaws.com/s3fs-public/uploads/2023-01/Investor%20Presentation%202023-01%20FINAL.pdf>.

⁴⁶ See Tessengerlo Kerley, Inc. (2022, August 31). *Tessengerlo Kerley, Inc. Celebrates Groundbreaking in Ohio for Fertilizer Facility*. <https://www.tkinet.com/en/defiance-ohio-groundbreaking>.

See also JobsOhio. (2022, January 31). *New Multi-Million Dollar Fertilizer Plant Coming to Northwest Ohio*. <https://www.jobsohio.com/news-press/new-multi-million-dollar-fertilizer-plant-coming-to-northwest-ohio>

⁴⁷ Alternative Fuels Data Center. (2023). *Locate Stations* [Station Data by State]. https://afdc.energy.gov/data_download.

⁴⁸ See U-Haul. (n.d.). *Propane AutoGas Trip Planner* [What is Propane AutoGas Fleet?]. <https://www.uhaul.com/Propane/AutoGas>. See also U-Haul. (n.d.). *Beginner's Guide to Autogas Vs. Gasoline*. <https://www.uhaul.com/Tips/Propane/Beginners-Guide-To-Autogas-Vs-Gasoline-18268/>

⁴⁹ Alternative Fuels Data Center. (August 2014). *Costs Associated with Propane Vehicle Fueling Infrastructure*. https://afdc.energy.gov/files/u/publication/propane_costs.pdf.

⁵⁰ Joint Office of Energy and Transportation. (2023). *Technical Assistance and Resources for States and Communities* [Charging and Fueling Infrastructure (CFI) Discretionary Grant Program]. <https://driveelectric.gov/states-communities>.

⁵¹ U.S. Department of Transportation. (2023, March 21). *Charging and Fueling Infrastructure Discretionary Grant Program*. <https://www.grants.gov/web/grants/view-opportunity.html?oppld=346798>.

proximity to an Alternative Fuel Corridor, award amounts will start at a minimum of \$1 million with no cap on the maximum award amount. For both project types, the awarded amount can cover up to 80% of total project cost.

Figure 9: Alternative Fuel Corridors in Ohio⁵²



Data Source: U.S. Department of Transportation (2022)

⁵² See U.S. Department of Transportation. (2022, November 1). *Alternative Fuel Corridors*. <https://hub.arcgis.com/datasets/usdot::alternative-fuel-corridors/about>

c. Hydrogen

A team of companies have coalesced around a plan to develop a \$1.6 billion closed-loop manufacturing facility powered by clean hydrogen at the former site of the DOE's Portsmouth Gaseous Diffusion Plant near Piketon.⁵³ Newpoint Gas, the lead on the project, will procure hydrogen from natural gas, capturing the associated CO₂ and storing it in nearby geologic formations.⁵⁴ In March 2023, Newpoint signed a teaming agreement with CDM Smith for the latter to serve as the engineering, procurement, and construction (EPC) partner on the Piketon clean hydrogen project.⁵⁵ This adds to an already established list of partners that includes Babcock & Wilcox, which will provide foundational technology for hydrogen generation and decarbonization, and J.W. Didado as the primary electrical contractor.⁵⁶

Cumulative downstream investments reported to date in Ohio, including 2011 through the first half of 2022, are set forth in Table 19 in Appendix A. An outline of the key products and processes for this sector within the shale gas value chain is set forth in Appendix B.

3. CONCLUSION

Total upstream shale investment in Ohio was up considerably (+29.3%) for the first half of 2022 compared to the second half of 2021. This increase accompanied surging natural gas prices that in the first half of 2022 more than doubled average prices for 2016 through 2021. This upward trend in upstream investment likely continued into the second half of 2022, during which the region saw some of its highest natural gas prices (>\$8/MMBtu at local hubs) since the advent of shale development. While southerly Belmont County again led all counties in production, more northerly Jefferson County for the fourth six-month period in a row had the highest number of new wells developed. Indeed, 65% of new well development during the Study period occurred in more northerly counties (Carroll, Columbiana, Harrison, and Jefferson), suggesting that investment for this segment continues to be tilted toward the northern part of the Utica. Altogether, upstream shale investment totaled nearly \$2.8 billion for the first half of 2022. It remains to be seen how the geographical distribution of drilling will change as a result of EOG's recent investment into the condensate heavy parts of the Utica.

⁵³ Business Wire. (2022, September 8). *J.W. Didado Electric to Partner with Newpoint Gas on Advanced Hydrogen Generation and Carbon Sequestration Project in Ohio*. <https://www.businesswire.com/news/home/20220908005657/en/J.W.-Didado-Electric-to-Partner-with-Newpoint-Gas-on-Advanced-Hydrogen-Generation-and-Carbon-Sequestration-Project-in-Ohio>

⁵⁴ See Columbus Dispatch. (2022, May 17). *Hydrogen Power Plant Proposed for Former Uranium Enrichment Facility in Southern Ohio*. <https://www.dispatch.com/story/business/2022/05/17/hydrogen-power-facility-planned-site-former-piketon-plant/9798251002/>. See also Newpoint Gas. (2022). *h2Trillium Energy and Manufacturing (h2TEAM) Complex*. <https://www.newpointgas.com/wp-content/uploads/2022/06/Final-h2TEAM-%E2%80%93-Revitalizing-Central-Appalachia-2022.6.15.pdf>

⁵⁵ Newpoint Gas. (2023, March 21). *CDM Smith and Newpoint Gas Sign Clean Hydrogen Project Teaming Agreement to Reindustrialize Former DOE Site in Pike County Ohio*. <https://www.newpointgas.com/news/cdm-smith-and-newpoint-gas-sign-clean-hydrogen-project-teaming-agreement-to-reindustrialize-former-doe-site-in-pike-county-ohio/>

⁵⁶ *Id.*

Midstream investments for the first half of 2022 were constrained as the region appears to have sufficient processing capacity for the time being. Pipeline projects to enhance takeaway capacity out of the region, particularly the \$161 million Ohio Valley Connector Expansion project, continued to progress and could commence with construction in the first half of 2023. Gathering system buildout continued during the Study period, with an estimated investment of \$18 million for pipelines and \$12.8 million for compression. Additional midstream spending included \$5.3 million towards a propane rail terminal.

The first half of 2022 saw a pause in downstream investment. However, this will soon change. Construction starts representing at least \$2 billion in natural gas power generation are planned for 2023. Also, construction for a 500-metric ton/day hydrogen production plant that uses natural gas with carbon capture—part of a \$1.6 billion clean energy manufacturing facility—is planned to commence sometime in 2023.⁵⁷ Spurred by federal support for alternative fueling stations, additional millions may flow into the state to build out refueling infrastructure for CNG, LNG, LPG, and hydrogen-powered vehicles.

Altogether, shale-related investment in Ohio for the first half of 2022, including upstream, midstream, and downstream, was around \$2.8 Billion. Cumulative total shale related investment since 2012 is around \$100.6 billion.

⁵⁷ See Newpoint Gas. (2022). *h2Trillium Energy and Manufacturing (h2TEAM) Complex*. <https://www.newpointgas.com/wp-content/uploads/2022/06/Final-h2TEAM-%E2%80%93-Revitalizing-Central-Appalachia-2022.6.15.pdf>

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About the Energy Policy Center

The Energy Policy Center is housed within the Maxine Goodman Levin College of Urban Affairs at Cleveland State University. The mission of the EPC is to help overcome social and institutional barriers to the implementation of solutions to energy challenges by providing an objective channel for the free exchange of ideas, the dissemination of knowledge, and the support of energy related research in the areas of public policy, economics, law, business and social science. For more information, go to <http://urban.csuohio.edu/epc/>.

4. APPENDICES

APPENDIX A. CUMULATIVE OHIO SHALE INVESTMENT

Figure 10: Total Utica Production in Bcfe (Gas Equivalence) by County through June 2022

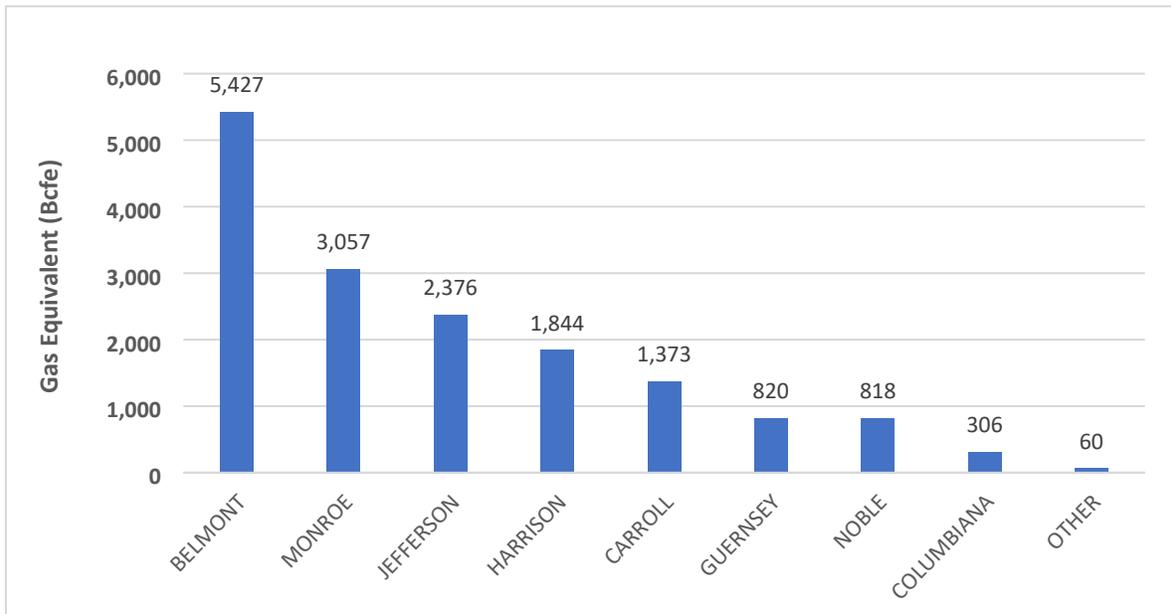


Figure 11: Total Utica Production in Bcfe by Operator through June 2022

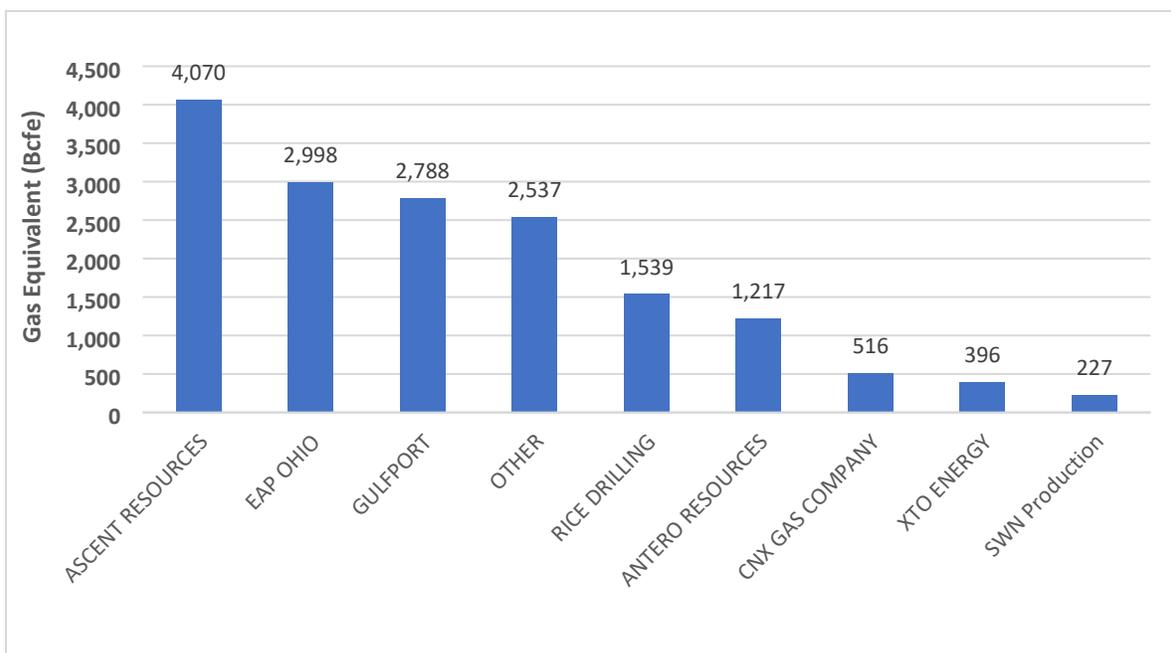
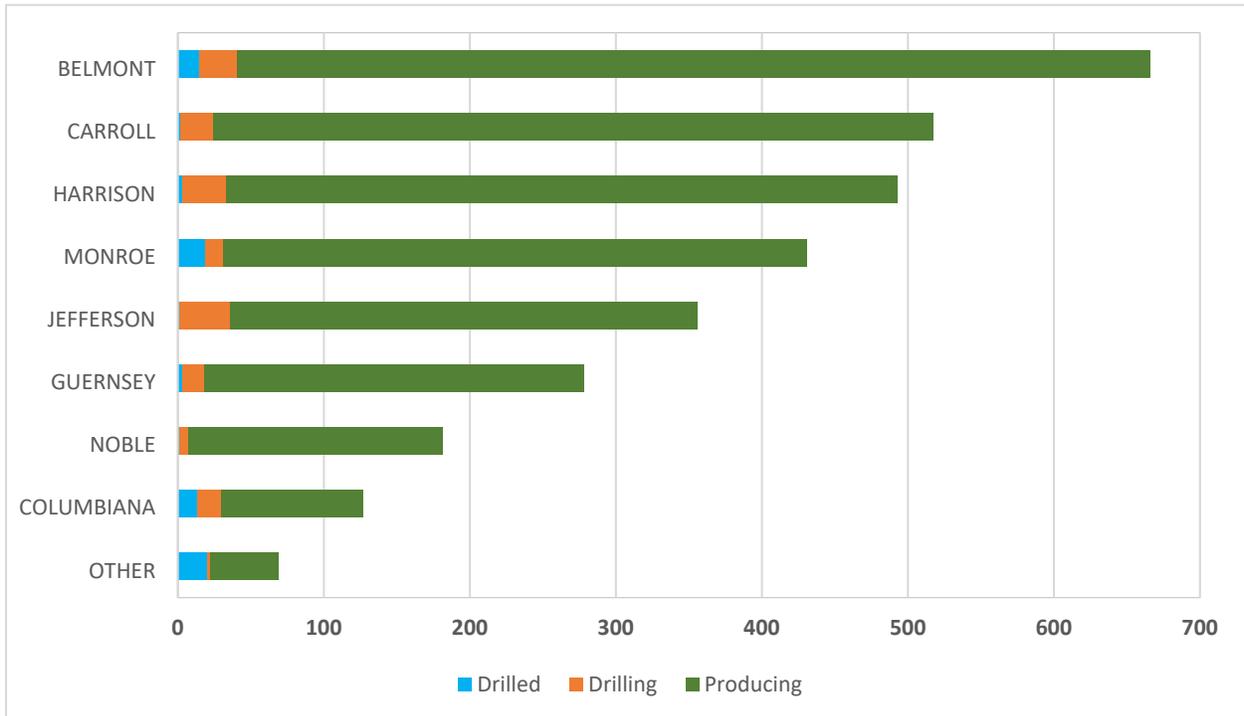


Figure 12: Cumulative Number of Wells by County through June 2022



Source: Ohio Department of Natural Resources (June 2022)

Figure 13: Distribution of Gas Equivalent Production for 2011 through June 2022

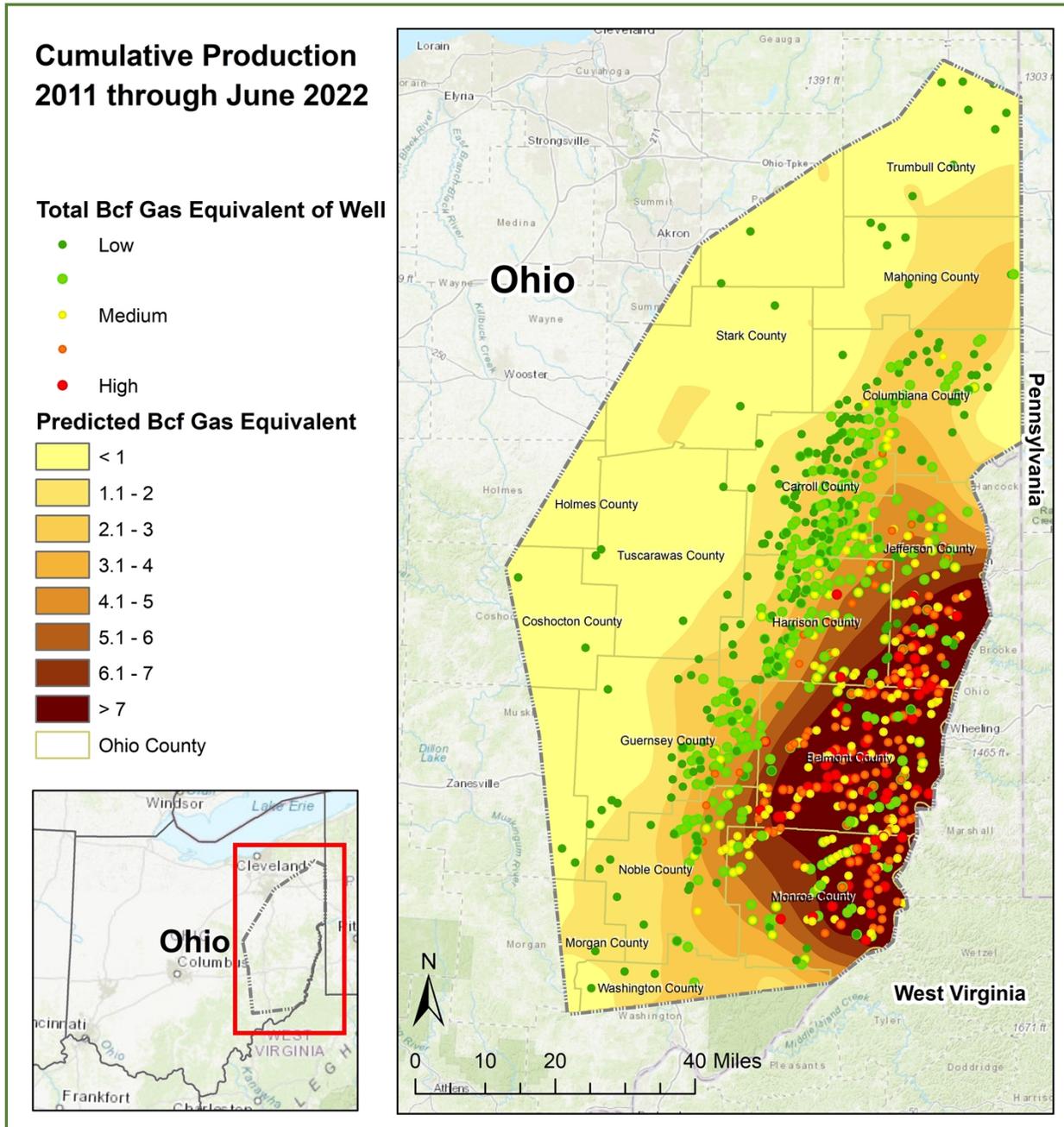


Figure 14: Distribution of Utica Wells by Status as of July 1, 2022

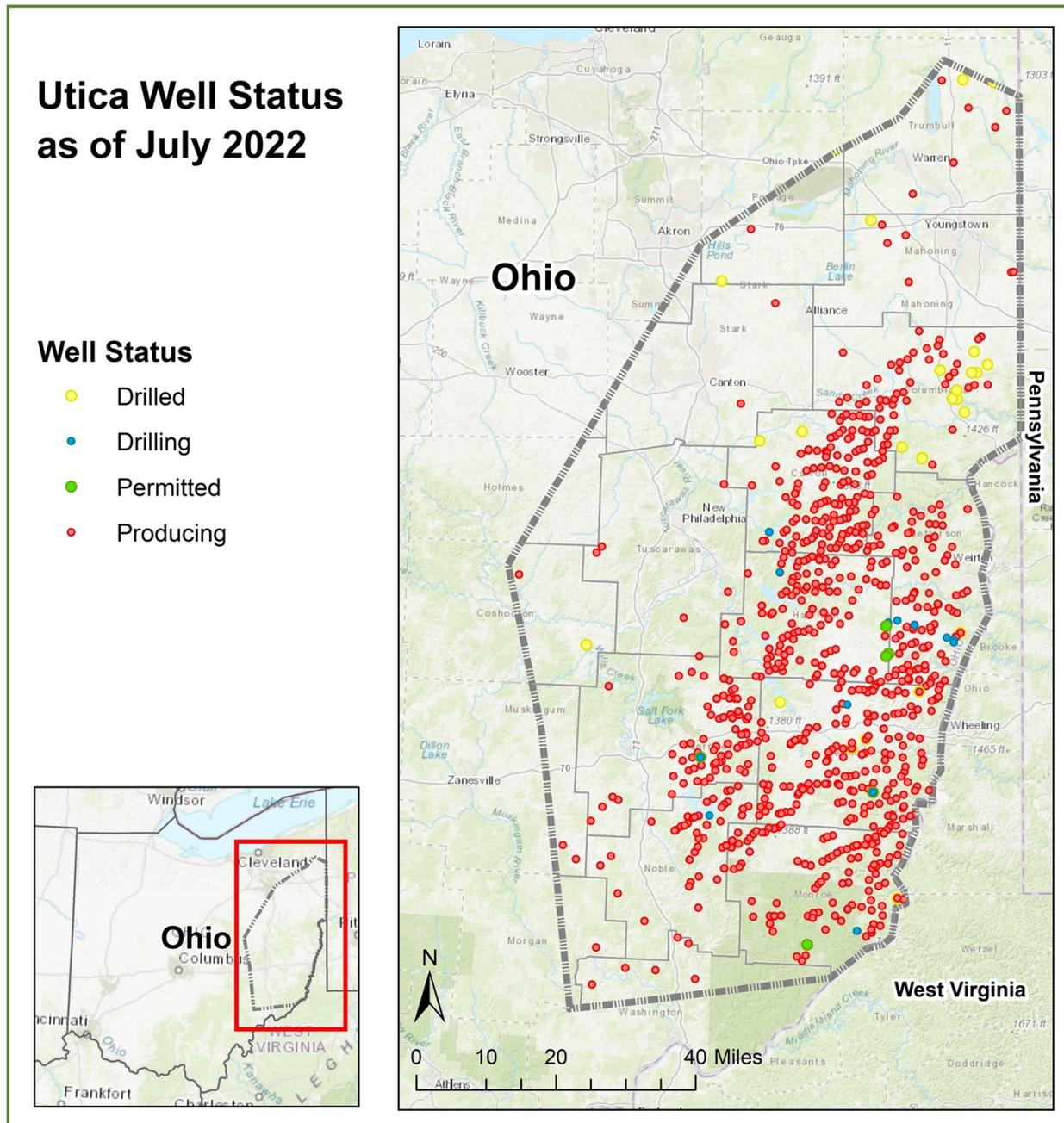


Table 15: Utica Upstream Companies Drilling in Ohio as of July 1, 2022

Operator	Cumulative no. of Wells
EAP OHIO LLC	929
ASCENT RESOURCES UTICA LLC	750
GULFPORT APPALACHIA LLC	437
ANTERO RESOURCES CORPORATION	242
SWN Production (Ohio) LLC	208
RICE DRILLING D LLC	149
XTO ENERGY INC.	58
HILCORP ENERGY COMPANY	47
CNX GAS COMPANY LLC	46
INR OHIO LLC	45
EQUINOR USA ONSHORE PROPERTIES INC.	42
UTICA RESOURCE OPERATING LLC	37
PIN OAK ENERGY PARTNERS LLC	33
DIVERSIFIED PRODUCTION LLC	27
GEOPETRO LLC	17
GULFPORT ENERGY CORPORATION	12
ARTEX ENERGY GROUP LLC	9
NORTHWOOD ENERGY CORP	6
SUMMIT PETROLEUM INC	6
EOG RESOURCES INC.	5
CHESAPEAKE EXPLORATION LLC	3
DEVON ENERGY PRODUCTION CO LP	3
BRAMMER ENGINEERING INC	2
EQT PRODUCTION COMPANY	2
AMERICAN ENERGY UTICA LLC	1
BP AMERICA PRODUCTION COMPANY	1
ECLIPSE RESOURCES I LP	1
Grand Total	3,118

Note: Cumulative Number of Wells are calculated based upon the total number Drilled, Drilling, and Producing. Source: ODNR (July 1, 2022).

Table 16: Total Lease Operating Expenses through June 2022 (in millions)

Year	Period	Production Wells	Lease Operating Expenses for Period (\$mm)
2022	Q1 and Q2	2,886	178.6
2021	Q3 and Q4	2,791	151.8
2021	Q1 and Q2	2,806	205.7
2020	Q3 and Q4	2,705	206.1
2020	Q1 and Q2	2,610	266.2
2019	Q3 and Q4	2,497	262.2
2019	Q1 and Q2	2,273	228.0
2018	Q3 and Q4	2,200	231.0
2018	Q1 and Q2	1,874	191.2
2017	Q3 and Q4	1,818	121.8
2017	Q1 and Q2	1,588	141.3
2016	Q3 and Q4	1,467	101.2
2016	Q1 and Q2	1,355	97.6
2015	Annual	1,034	148.9
2014	Annual	612	88.1
2013	Annual	237	34.1
2012	Annual	82	3.0
2011	Annual	9	0.3
		Total	2,657.1

Table 17: Cumulative Utica-Related Upstream Investments in Ohio through June 2022

Estimated Investments	Total Amount
Mineral Rights	\$25,724,763,000
Drilling	\$29,974,440,000
Roads	\$1,116,115,310
Lease Operating Expenses	\$2,657,165,486
Royalties	\$11,385,688,000
Total	\$70,858,171,796

Table 18: Cumulative Utica-Related Midstream Investments in Ohio through June 2022

Estimated Investments	Total Amount
Midstream Gathering	\$7,807,279,000
Processing Plants	\$1,259,300,000
Fractionation Plants	\$1,697,360,000
NGL Storage	\$261,000,000
Rail Loading Terminals	\$150,270,000
Transmission Pipelines	\$10,304,128,000
Total	\$21,479,337,000

Table 19: Cumulative Utica-Related Downstream Investments in Ohio through June 2022

Estimated Investments	Total Amount
Petrochemical Plants and Refineries	\$635,443,000
Other Industrial Plants	\$760,000,000
Natural Gas Refueling Stations	\$78,675,000
Natural Gas Power Plants	\$6,442,500,000
Combined Heat and Power (CHP) Plants	\$377,370,000
Total	\$8,293,988,000

APPENDIX B. METHODOLOGY

1. Upstream Methodology.

Investment into the upstream for this fourth report has been broken down into four categories.

a. Wells and Related Roads. The first category is investment into wells and includes one-time investments into drilling and road construction related to well development. They were estimated as:

- Drilling:
 - Drilling and completion costs of \$8.2 mm/well.⁵⁸
 - Equivalent true vertical depth (TVD) for wells in all counties.
 - Average drilling and completion costs of \$600 per lateral foot.⁵⁹
 - Average lateral length of 13,600 ft.⁶⁰
- Roads: average investments - approximately \$119,000 per well based on recent OOGA reports and data for 2021 from engineer’s office in Carroll, Noble, and Monroe counties.⁶¹

The number of new wells developed in the Study period, used as a basis for these calculations, were accounted for by subtracting the number of wells in the drilled, drilling and producing categories as of December 31, 2021, from the number existent as of June 30, 2022. This information was downloaded from the ODNR’s weekly *Combined Utica/Point Pleasant Shale Permitting Report*.⁶²

b. Lease Operating Expense. The second estimated upstream cost identified by operators is the “lease operating expense.” This includes post-production costs such as the storage,

⁵⁸ Previous shale reports distinguished between drilling costs for northern counties (Carroll, Harrison, Jefferson, Columbiana, Trumbull, Mahoning and Tuscarawas) and southern counties (Noble, Guernsey, Belmont, Monroe and Washington) based on the assumption that the Utica is deeper in the south, requiring more expensive drilling in over-pressured formations. The Study Team conducted a review of drilling surveys associated with ODNR completion reports for new wells drilled since January 2020 and found a difference in mean true vertical depth between northern and southern counties of less than 500 ft., which would likely not lead to significant cost differences. Also, the same review of drilling surveys indicated that laterals for new wells in southern counties were not longer on average than for those in the north, contrary to prior analyses of lateral lengths by county. Indeed, laterals for wells in northern counties were found to be about 600 feet longer on average than those in the south, although this difference would likely not lead to significant cost differences.

⁵⁹ Based on Ascent Resources’ and Antero Resources’ recent estimated drilling costs per lateral foot in the Appalachian Basin. See PR Newswire. (2022, March 10). *Ascent Resources Utica Holdings, LLC Reports Fourth Quarter and Year-End 2021 Operating and Financial Results and Issues Initial 2022 Guidance*. <https://www.prnewswire.com/news-releases/ascent-resources-utica-holdings-llc-reports-fourth-quarter-and-year-end-2021-operating-and-financial-results-and-issues-initial-2022-guidance-301500382.html>. See also PR Newswire. (2021, February 17). *Antero Resources Reports Fourth Quarter Results, Announces 2021 Guidance, Proved Reserves and Drilling Partnership*. <https://www.prnewswire.com/news-releases/antero-resources-reports-fourth-quarter-results-announces-2021-guidance-proved-reserves-and-drilling-partnership-301230367.html>.

⁶⁰ Calculated using well completion reports obtained from the ODNR’s *Ohio Oil & Gas Well Database*.

⁶¹ See fn 16, *supra*.

⁶² Ohio Department of Natural Resources. (2023). *Horizontal Wells*. <https://ohiodnr.gov/business-and-industry/energy-resources/oil-and-gas-wells/horizontal-wells>

processing and disposal of produced water, among other expenses. Lease operating expenses for Utica wells were estimated to be a production-based \$0.16/Mcf-equivalent. This average expense was developed by the Study Team based on analysis of Ascent’s and Gulfport’s lease operating expenses in the Utica for the first half of 2022 as reported in their quarterly financial statements.⁶³

c. Oil and Gas Production Royalties. A third area of upstream investment, royalty calculation, is more complicated. The estimate is based upon the total production over the six-month period and the likely price received for sales of the hydrocarbon during that same period. However, because much of the natural gas has been processed, Ohio Department of Natural Resources production records cannot be readily converted to royalty payments. Accordingly, a number of assumptions are required to estimate the royalties paid. These include estimating the local market conditions at the time hydrocarbons were sold. Royalties were estimated on a per quarter basis for Utica production based upon the hydrocarbon content for a typical Utica well.

To estimate the royalties, the following assumptions were made based upon industry interviews, industry investor presentations, and Energy Information Agency reports:

- Production for each well was similar to that found in the wet gas region, and not the dry gas or condensate regions. This represents the average situation.
- The average production shrinkage after processing was 12%, thereby making the residue gas volume 88% of the total natural gas production.⁶⁴
- The residue energy content was around 1.1 MMBtu/Mcf.⁶⁵
- Residue gas in the Utica was selling at an average price of \$4.17/MMBtu for Q1 and \$6.85/MMBtu for Q2.⁶⁶ These prices were used to estimate royalties.
- Around 44 barrels of liquids were recovered per million cubic feet of gas produced.⁶⁷
- Natural gas liquids were selling for around 30% of the listed price for Marcellus-Utica light crude oil.⁶⁸
- Oil in the Utica region was selling for \$84.54 and \$98.71 per barrel, on average, during the first and second quarters of 2022, respectively.⁶⁹
- Royalty rates are 20% of gross production.

⁶³ See Ascent Resources’ financial reports at <https://ascentresources.com/financials>. See also Gulfport Energy’s financial reports at <https://www.gulfportenergy.com/investors/sec-filings/quarterly-reports>.

⁶⁴ Based on industry interviews, experts citing API 12.3, Manual of Petroleum Measurements and Standards.

⁶⁵ EIA estimates a conversion rate of 1.037 MMBtu/Mcf (see <https://www.eia.gov/tools/faqs/faq.php?id=45&t=8>). However, industry interviews suggest 1.1 is closer to the average conversion for the Utica Shale.

⁶⁶ Reflects average price across the Columbia Gas, Eastern Gas South, and Texas Eastern M-2 trading hubs as derived from ICE trade data published by Snyder Brothers Gas Marketing at <https://www.snyderbrothersinc.com>. Hub prices reflect the delivered price of natural gas and so do not require further deductions for transportation costs. See <https://www.eia.gov/todayinenergy/detail.php?id=18391>

⁶⁷ Based on industry data.

⁶⁸ Based on industry interviews.

⁶⁹ See Marcellus/Utica prices for light crude at <http://ergon.com/prices>. More than 95% of Ohio oil production is light crude by API gravity. See <https://www.eia.gov/petroleum/production/xls/api-history.xls>

d. New and Renewal Lease Bonuses. Finally, a fourth form of upstream investment was estimated: new and renewal lease bonuses. For this purpose, we assumed that the average new lease or renewal bonus paid was \$5000/acre, and that the typical lease has a five-year primary term. In prior studies, based upon the assumption that most undeveloped acreage was in the primary term of the least, we assumed that approximately 20% of the undeveloped acreage identified will need to be renewed each year or is otherwise new.⁷⁰ Since this Study covered six months, we assumed that half of this 20% was renewed or new during the Study period. However, as units have developed in the Utica, we have changed this estimate going forward to assume that 25% of the operator's total acreage is in its primary term, and that 20% of this acreage must be renewed or replaced very year (10% for a six-month period). This estimate may be high insofar as companies are not renewing or replacing all their primary term acreage. However, it may also be low insofar as the studies have only identified net acreage for the top six to nine operators in Ohio and may not be capturing all of the non-operator net acreage. (Acreage status is typically reported in company 10-K and other financial statements).

2. Midstream Methodology.

Midstream investments include pipeline construction (intrastate, gathering lines and inter-state), processing plants (compression, dehydration, fractionation, and others), natural gas liquid storage facilities, and railroad terminals and transloading facilities. Midstream expenditures were estimated based upon a combination of midstream company investor reports, media reports, and industry "rules of thumb" obtained from industry interviews, government reports, and industry trade journals. Estimated investments were then compared against investor presentations and other information gleaned from public sources to confirm their accuracy. Interviews were also used to confirm ranges of expenditures.

a. Processing plants. Processing plant information was obtained by searching a wide range of resources including EPA permit databases, news agencies, and company web sites and presentations. For purposes of estimating the investments for midstream processing plants, rules of thumb were developed based upon facility throughput capacities. These rules of thumb were applied to the processing plants that have been built in Ohio, using the throughput capacity estimates cited in permit documents, or made available from public literature. Likewise, rules of thumb based upon throughput capacity were used to estimate investments downstream of the processing plants, such as storage facilities and loading terminals. Dehydration processing plants were estimated using average cost per Mcf capacity for similarly designed and recently built plants in the Appalachian region.

Compressor station investments were calculated based on the horsepower rating listed in Ohio EPA air permit data and estimated construction costs per horsepower of \$4,631 for the Midwest

⁷⁰ This estimate was confirmed through industry interviews. New operator undeveloped acreage reports are likely to be made available over time that may suggest these estimates could be either too high or too low.

Region as projected by the Interstate Natural Gas Association of America (INGAA) for 2022 after adjusting for inflation.⁷¹

The approximate capital cost for TEG dehydration units based on throughput was obtained from Carroll's *Natural Gas Hydrates: A Guide for Engineers* (2014, 3rd ed.). Facilities receiving a final permit-to-install or permit-to-install-and operate were assumed to be constructed during the same 6-month period in which the permit was issued by the Ohio EPA.

The following assumptions were used to estimate midstream-related investments:

- Processing Plants.
 - \$400,000 per MMcf/d throughput
 - \$80 MM per 200 MMcf/d plant (typical skid size)
- Fractionation Plants: \$3,542 per bbl/d⁷²
- Storage Tankage: \$80 MM for 1 Bcf/d throughput
- Rail Loading Terminals: \$40 MM for 1 Bcf/d throughput

b. Pipelines. Pipeline investments were estimated by applying “inch-mile” cost estimates to known pipeline diameter and length for both inter- and intrastate projects. Interstate pipeline diameters and mileage can be determined from Federal Energy Regulatory Commission data. These estimates were confirmed from investor presentations, when available. Intrastate mileage and diameter were determined using data for gathering system construction that was obtained from the Public Utilities Commission of Ohio.

For this report, up-to-date cost projections for natural gas transmission and gathering line pipelines, per inch-mile, was obtained from the INGAA. The estimated cost for natural gas pipelines for the Midwest Region as used in this analysis was \$237,353 per inch-mile, which included labor, raw materials, and permitting costs, as projected by the INGAA for 2022 after adjusting for inflation.⁷³

No investments into distribution lines were included in the Study since it is assumed that these have not grown as a direct result of shale development. For pipelines carrying liquids, the

⁷¹ See The INGAA Foundation, Inc. (2018). *North America Midstream Infrastructure through 2035*. <https://ingaa.org/wp-content/uploads/2018/06/34703.pdf>. INGAA's projections for midstream infrastructure costs are in 2016 dollars. These projections were converted to 2022 dollars using the Bureau of Labor Statistics' Producer Price Index for *Other Pipeline Transportation* (available at <https://fred.stlouisfed.org/series/PCU48694869>).

⁷² The Study Team reviewed the published investment costs and throughput capacities of eight different fractionation facilities that have been developed since 2018, all of which are in Texas. The assumed unit cost for fractionation reflects the median investment per barrel of processing capacity per day for these eight facilities. See the following examples: Targa Resources Inc.'s Mont Belvieu fractionation facilities (<https://www.naturalgasintel.com/targa-building-two-new-fractionation-trains-at-mont-belvieu/>); Phillip 66's Sweeny fractionation facilities (https://s22.q4cdn.com/128149789/files/doc_presentations/2019/11/Investor-Day-Slides-for-Website-11.06.2019-vF.pdf).

⁷³ See fn 71, *supra*.

investment assumption is that expenditures will be comparable to those seen for gas pipelines. These were also corroborated by industry investor reports.

3. Downstream Methodology.

For estimating downstream expenditures, the Study Team relied upon publicly available reports gathered from news media, trade association publications, company websites and investor presentations. The Study Team also used interviews, and Ohio EPA permits and public notices to identify projects and support investment estimates. Search terms included identified company names, and key words associated with specific facility types and industries.

As of this report, downstream investment is categorized into eight categories:

- Natural Gas Power Plants
- Combined Heat and Power Plants
- Ethane Cracker Plants
- Methanol Plants
- Refineries
- Natural Gas refueling stations
- Petrochemical Plants
- Other industrial plants with natural gas inputs

NAICS codes used to generate keywords for searches included the following:

3251 – Basic Chemical Manufacturing

3252 – Resin, Synthetic Rubber, and Artificial and Synthetic Fibers and Filaments Manufacturing

3253 – Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing

3255 – Paint, Coating, and Adhesive Manufacturing

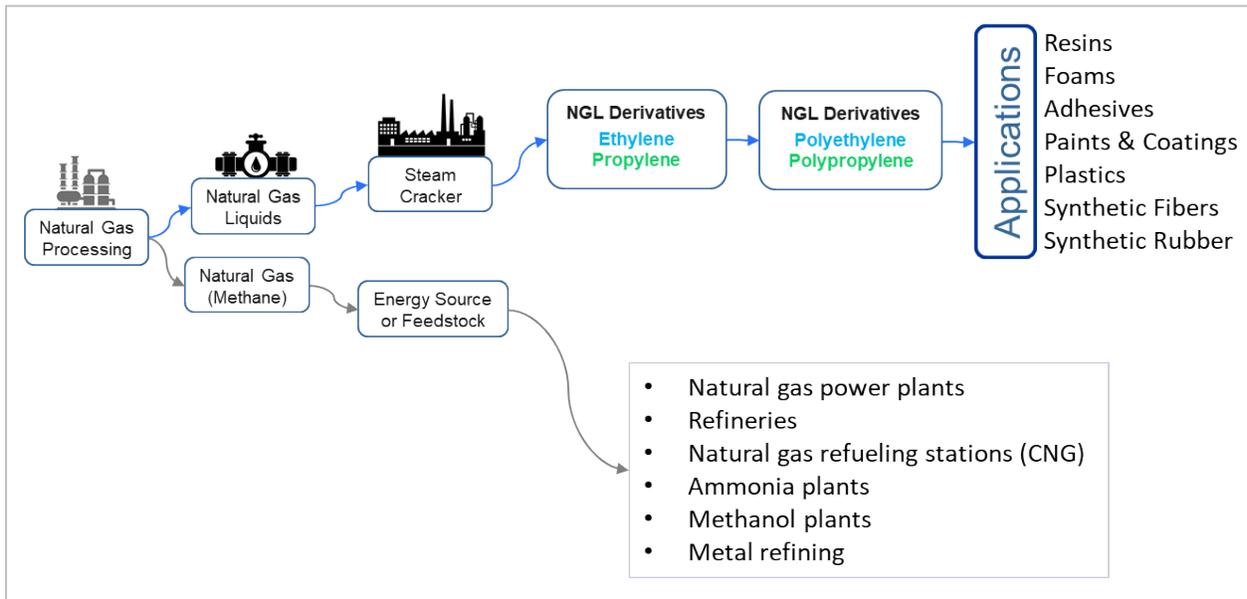
3259 – Other Chemical Product and Preparation Manufacturing

3261 – Plastics Product Manufacturing

Downstream activities include the deployment of processes that turn hydrocarbons— natural gas (methane) and natural gas liquids (ethane, propane, butanes)—into higher-valued fuels and petrochemicals. Shale gas may be monetized into numerous resulting value-added products. Figure 15 shows the primary intermediates and products that can be manufactured from the main hydrocarbon components in shale gas as part of downstream production.⁷⁴

⁷⁴ See U.S. Department of Energy. (June 2020). *The Appalachian Energy and Petrochemical Renaissance: An Examination of Economic Progress and Opportunities*. https://www.energy.gov/sites/prod/files/2020/06/f76/Appalachian%20Energy%20and%20Petrochemical%20Report_063020_v3.pdf

Figure 15: Shale/Natural Gas Value Chain for Petrochemicals



Impacts of the Oil and Natural Gas Industry on the US Economy in 2021

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Prepared for

**American Petroleum
Institute**



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Impacts of the Oil and Natural Gas Industry on the US Economy in 2021

Executive Summary

This report explores the economic impact of the oil and natural gas industry in the United States. These impacts are the result of three channels: direct impacts from the employment and production within the oil and natural gas industry; indirect impacts through the industry's purchases of intermediate and capital goods from a variety of other US industries; and induced impacts from the personal purchases of employees and business owners both within the oil and natural gas industry and its supply chain, as well as from the personal spending by shareholders out of the dividends received from oil and natural gas companies.¹

The American Petroleum Institute engaged PwC to quantify the economic impacts of the US oil and natural gas industry in terms of employment, labor income, and value added at the national, state, and congressional district level.² This report provides PwC's economic impact estimates for 2021.

The report's findings show that the US oil and natural gas industry has a widespread economic impact throughout all sectors of the economy. Combining the industry's direct, indirect, and induced impacts, the industry's total impact amounted to 10.8 million full-time and part-time jobs and accounted for 5.4 percent of total US employment in 2021 (see **Table ES-1**, below).

Table ES-1.– Total Operational and Capital Investment Impacts of the Oil and Natural Gas Industry on the US Economy, 2021

Item	Direct Impacts	Indirect and Induced Impacts		Total Impacts	Percent of US Total
		Operational Impacts	Capital Investment Impacts		
Employment (millions)*	2.3	7.1	1.4	10.8	5.4%
Labor Income (\$ billions)**	278.5	526.9	103.3	\$908.7	6.4%
Value Added (\$ billions)	773.6	844.5	156.0	\$1,774.1	7.6%

Source: PwC calculations using the IMPLAN modeling system. Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

At the national level, each direct job in the oil and natural gas industry supported an additional 3.8 jobs elsewhere in the US economy in 2021 (for a multiplier of 4.8). Counting direct, indirect, and induced impacts, the industry's total impact on labor income (including proprietors'

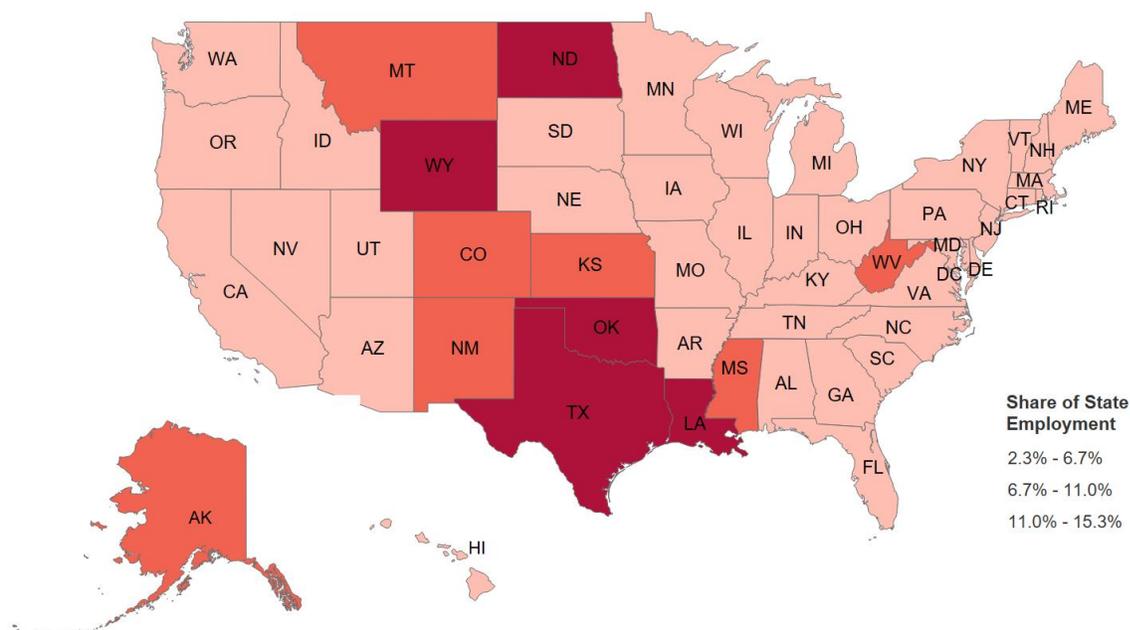
¹ These economic impacts represent the entire *backward linkages* of the US oil and natural gas industry to its suppliers. They do not capture *forward linkages* (i.e., the economic impact on production in sectors that use oil and natural gas as an input).

² Value added refers to the additional value created at a particular stage of production. It is a measure of the overall importance of an industry and represents the industry's portion of US gross domestic product ("GDP"). Value added consists of: employee compensation, proprietors' income, income to capital owners from property, and indirect business taxes (including excise taxes, property taxes, fees, licenses, and sales taxes paid by businesses).

income) was \$908.7 billion, or 6.4 percent of the US national labor income in 2021. The industry's total impact on US GDP was nearly \$1.8 trillion, accounting for 7.6 percent of the national total in 2021.

The economic impact of the oil and natural gas industry can be seen across the United States. The states with the largest direct employment effects are Texas, California, Oklahoma, Pennsylvania, and Louisiana, each with more than 90,000 jobs directly attributable to the oil and gas industry. In 30 states the industry directly and indirectly supported at least 100,000 jobs in 2021. Texas alone had 2.5 million jobs directly and indirectly supported by the industry, and California had over 1 million jobs directly and indirectly supported by the industry. The share of state employment supported by the oil and natural gas industry (including direct, indirect, and induced impacts) ranges from 2.3 percent in the District of Columbia to 15.3 percent in Oklahoma (see **Figure ES-1**, below).

Figure ES-1. Share of Employment Directly and Indirectly Supported by the Oil and Natural Gas Industry, 2021



Source: PwC calculations.

At the congressional district level, the number of jobs directly provided by the oil and natural gas industry was at least 1,000 in all but 11 districts and exceeded 5,000 in 121 congressional districts in 2021. Including direct, indirect, and induced effects, the industry supported more than 10,000 jobs in all but four congressional districts in 2021.

These results were calculated using the IMPLAN model, an input-output model based on government data.

Impacts of the Oil and Natural Gas Industry on the US Economy in 2021

I. Introduction

The American Petroleum Institute engaged PwC to quantify the economic impacts of the US oil and natural gas industry on the national economy in terms of employment, labor income, and value added.³ This report presents PwC's economic impact estimates for 2021.⁴

In describing the economic impact of the US oil and natural gas industry through its employment and purchases of goods and services, this report considers three separate channels -- the direct impact, the indirect impact, and the induced impact -- that in aggregate provide a measure of the total economic impact of the US oil and natural gas industry.⁵

- **Direct impact** is measured as the jobs, labor income, and value added *within* the oil and natural gas industry.
- **Indirect impact** is measured as the jobs, labor income, and value added occurring *throughout the supply chain* of the oil and natural gas industry attributable to its operating and capital expenditures.⁶
- **Induced impact** is measured as the jobs, labor income, and value added resulting from *household spending* of labor and proprietor's income earned either directly or indirectly from the oil and natural gas industry's spending and from the personal spending by shareholders out of the dividends received from oil and natural gas companies.

Together these effects result in the oil and natural gas industry having a widespread economic impact throughout all sectors of the US economy.

The main data source for the industry's direct jobs, labor income, and value added is the *State Annual Personal Income and Employment* data set published by the US Bureau of Economic Analysis ("BEA").

³ Value added refers to the additional value created at a particular stage of production. It is a measure of the overall importance of an industry and represents the industry's share of GDP. Value added consists of: employee compensation, proprietors' income, income to capital owners from property, and indirect business taxes (including excise taxes, property taxes, fees, licenses, and sales taxes paid by businesses).

⁴ PwC has prepared several prior economic impact studies for the American Petroleum Institute, with the most recent being *Economic Impacts of the Oil and Natural Gas Industry on the US Economy in 2019* (July 2021).

⁵ These economic impacts represent all of the *backward linkages* of the oil and natural gas industry to its suppliers. They do not capture *forward linkages* (i.e., the economic impact on production in sectors that use oil and natural gas as an input).

⁶ Operating expenditures are the costs of noncapital inputs (such as materials, rent, and utilities) for a company to run its business operations on a daily basis. Capital expenditures are the amounts that companies use to purchase major physical goods or services that will have a productive life of more than one year.

We have developed the estimates of the industry’s indirect and induced economic impacts using customized input-output models for each study area based on the IMPLAN input-output economic modeling system.⁷

The rest of this report is organized as follows. **Section II** defines the oil and natural gas industry for this study. **Section III** presents PwC’s estimates of the industry’s economic impacts at the national, state, and congressional district level in 2021. **Section IV** presents a composite measure of the industry’s total US “spend” – i.e., its direct economic contribution from the industry’s expenditures on labor and capital and its payment of dividends to US households and retirement plans. Detailed results by sector, by state, and by congressional district and an overview of the methodology are provided in the appendices.

⁷ The IMPLAN input-output economic modeling system is supported by the IMPLAN Group LLC. Its users include academia, federal, state, and local governments, and the private sector.

II. Industry Definition

The US oil and natural gas industry encompasses multiple activities that span separate industry classifications in government economic data. Oil and natural gas exploration and production is included in the mining sector; oil refining is part of the manufacturing sector; pipeline operations are included in the transportation sector; natural gas distribution is in the utilities sector; and oil marketing is considered part of the wholesale and retail trade sector. For this study, PwC has defined the oil and natural gas industry to include all of these activities.

Table 1, below, shows the composition of the industry as defined by PwC, followed by detailed descriptions based on the *North American Industry Classification System* (“NAICS”).

Table 1.– Composition of the US Oil and Natural Gas Industry

NAICS Code	Description
211	Oil and gas extraction (including NGL extraction)
213111	Drilling oil and gas wells
213112	Support activities for oil and gas operations
2212	Natural gas distribution (private and public)
23712	Oil and gas pipeline and related structures construction
32411	Petroleum refineries
32412	Asphalt paving, roofing and saturated materials manufacturing
324191	Petroleum lubricating oil and grease manufacturing
4247	Petroleum and petroleum products merchant wholesalers
44711, 44719	Gasoline stations
45431	Fuel dealers
486	Pipeline transportation

NAICS Code 211. Oil and gas extraction. Establishments in this subsector operate and/or develop oil and gas field properties. Such activities may include exploration for crude petroleum and natural gas; drilling, completing, and equipping wells; operating separators, emulsion breakers, desilting equipment, and field gathering lines for crude petroleum and natural gas; and all other activities in the preparation of oil and gas up to the point of shipment from the producing property. This subsector includes the production of crude petroleum, the mining and extraction of oil from oil shale and oil sands, and the production of natural gas, sulfur recovery from natural gas, and recovery of hydrocarbon liquids. Establishments in this subsector include those that operate oil and gas wells on their own account or for others on a contract or fee basis.

NAICS Code 213111. Drilling oil and gas wells. This subsector comprises establishments primarily engaged in drilling oil and gas wells for others on a contract or fee basis. This industry includes contractors that specialize in spudding, drilling, re-drilling, and directional drilling.

NAICS Code 213112. Support activities for oil and gas operations. This subsector comprises establishments primarily engaged in performing support activities on a contract or fee basis for oil and gas operations (except site preparation and related construction activities). Services included are exploration (except geophysical surveying and mapping); excavating slush pits and cellars, well surveying; running, cutting, and pulling casings, tubes, and rods; cementing wells, shooting wells; perforating well casings; acidizing and chemically treating wells; and cleaning out, bailing, and swabbing wells.

NAICS Code 2212. Natural gas distribution. This subsector comprises:

(1) establishments primarily engaged in operating gas distribution systems (e.g., mains, meters); (2) establishments known as gas marketers that buy gas from the well and sell it to a distribution system; (3) establishments known as gas brokers or agents that arrange the sale of gas over gas distribution systems operated by others; and (4) establishments primarily engaged in transmitting and distributing gas to final consumers. Both privately and publicly owned establishments are included in this study.

NAICS Code 23712. Oil and gas pipeline and related structures construction. This subsector comprises establishments primarily engaged in the construction of oil and gas lines, mains, refineries, and storage tanks. The work performed may include new work, reconstruction, rehabilitation, and repairs. Specialty trade contractors are included in this group if they are engaged in activities primarily related to oil and gas pipeline and related structures construction. All structures (including buildings) that are integral parts of oil and gas networks (e.g., storage tanks, pumping stations, and refineries) are included in this subsector.

NAICS Code 32411. Petroleum refineries. This subsector comprises establishments primarily engaged in refining crude petroleum into refined petroleum. Petroleum refining involves one or more of the following activities: (1) fractionation; (2) straight distillation of crude oil; and (3) cracking.

NAICS Code 32412. Asphalt paving, roofing, and saturated materials manufacturing. This subsector comprises establishments primarily engaged in (1) manufacturing asphalt and tar paving mixtures and blocks and roofing cements and coatings from purchased asphaltic materials and/or (2) saturating purchased mats and felts with asphalt or tar from purchased asphaltic materials. These are primarily petroleum-based products.

NAICS Code 324191. Petroleum lubricating oil and grease manufacturing. This subsector comprises establishments primarily engaged in blending or compounding refined petroleum to make lubricating oils and greases and/or re-refining used petroleum lubricating oils.

NAICS Code 4247. Petroleum and petroleum products merchant wholesalers. This subsector comprises establishments with bulk liquid storage facilities primarily engaged in the merchant wholesale distribution of crude petroleum and petroleum products, including liquefied petroleum gas.

NAICS Code 44711. Gasoline stations with convenience stores. This subsector comprises establishments engaged in retailing automotive fuels (e.g., diesel fuel, gasohol, gasoline) in combination with convenience store or food mart items. These establishments can either be in a convenience store (i.e., food mart) setting or a gasoline station setting. These establishments may also provide automotive repair services.

NAICS Code 44719. Other gasoline stations. This subsector comprises establishments known as gasoline stations (except those with convenience stores) primarily engaged in one of the following: (1) retailing automotive fuels (e.g., diesel fuel, gasohol, gasoline) or (2) retailing these fuels in combination with activities, such as providing repair services; selling automotive oils, replacement parts, and accessories; and/or providing food services

NAICS Code 45431. Fuel dealers. This subsector comprises establishments primarily engaged in retailing heating oil, liquefied petroleum (LP) gas, and other fuels via direct selling.

NAICS Code 486. Pipeline transportation. Establishments in this subsector use transmission pipelines to transport products, such as crude oil, natural gas, refined petroleum products, and slurry. It also includes the storage of natural gas because the storage is usually done by the pipeline establishment and because a pipeline is inherently a network in which all the nodes are interdependent.

III. Economic Impact of the Oil and Natural Gas Industry

This section presents the estimated economic impact of the oil and natural gas industry at the national, state, and congressional district level.

The total economic impact we have measured includes the **direct impact** (the jobs, labor income, and value added *within* the oil and natural gas industry), the **indirect impact** (the jobs, labor income, and value added occurring *throughout the supply chain* of the oil and natural gas industry), and the **induced impact** (the jobs, labor income, and value added resulting from *household spending* of labor and proprietor's income earned either directly or indirectly from the oil and natural gas industry's spending and from dividends received from publicly traded oil and natural gas companies).

To quantify these linkages, we rely on the IMPLAN model, an input-output (I-O) model based on government data. For this analysis, we have separately quantified the indirect and induced impacts of the oil and natural gas industry's **operational** and **capital spending**. Operating expenditures are the costs of noncapital inputs (such as materials, rent, and utilities) for a company to run its business operations on a daily basis. Capital expenditures are the amounts that companies use to invest in major physical goods or services that have a productive life of more than one year.

A. National Results

The economic activity of the industry is measured using three separate metrics: employment, labor income, and value added, as defined below.

- **Employment:** The number of payroll and self-employed jobs (including part-time jobs), averaged over the year.
- **Labor income:** The wages and salaries and benefits paid to employees and proprietors' income for the self-employed.
- **Value added:** The total output of each sector less the associated value of intermediate inputs. The sum of the value added across all sectors in the economy is GDP.⁸ An industry's value added represents its contribution to GDP.

Table 2, below, shows the direct impact of the US oil and natural gas industry on the US economy in terms of employment, labor income (including wages and salaries and benefits as well as proprietors' income), and value added. In 2021, the oil and natural gas industry directly provided 2.3 million jobs for American workers, paid \$278.5 billion in wages and salaries and benefits and proprietors' income, and generated \$773.6 billion in GDP. The industry's direct national impact on the US jobs, labor income, and value added ranged from 1.1 percent to 3.3 percent in 2021 (see **Appendix A** for a breakout of the industry's direct impact by detailed subsector).

⁸ Value added differs from gross output (or sales) because it excludes the value of intermediate goods that are embedded in the final sales of each industry.

Table 2. Direct Impact of the Oil and Natural Gas Industry on the US Economy, 2021

	Employment ⁽¹⁾ (millions of jobs)	Labor Income ⁽²⁾ (\$ billions)	Value Added (\$ billions)
The US Oil and Natural Gas Industry's Direct Impact	2.3	\$278.5	\$773.6
As a percent of the US economy	1.1%	1.9%	3.3%

Source: Estimates based on 2021 employment data from the US Bureau of Economic Analysis and supplemented by data from the US Bureau of Labor Statistics and US Census Bureau and 2021 input-output relationships from the IMPLAN modeling system.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

As shown in **Table 3**, below, the US oil and natural gas industry's total economic impact (including direct, indirect, and induced impacts from both operational and capital spending) ranged between 5.4 percent and 7.6 percent of all US jobs, labor income, and value added in 2021.

Table 3.- Total Impact of the Oil and Natural Gas Industry on the US Economy, 2021

Item	Amount	Percent of US Total
Operational Impact		
Employment (millions of jobs)*	9.4	4.7%
Labor Income (\$ billions)**	\$805.4	5.6%
Value Added (\$ billions)	\$1,618.1	6.9%
Capital Investment Impact		
Employment (millions of jobs)*	1.4	0.7%
Labor Income (\$ billions)**	\$103.3	0.7%
Value Added (\$ billions)	\$156.0	0.7%
Total Impact		
Employment (millions of jobs)*	10.8	5.4%
Labor Income (\$ billions)**	\$908.7	6.4%
Value Added (\$ billions)	\$1,774.1	7.6%

Source: PwC calculations using the IMPLAN modeling system.

Note: Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Employment

PwC estimates that the US oil and natural gas industry's *operations* directly or indirectly supported 9.4 million full- and part-time jobs in the national economy in 2021. Further, the industry's *capital investment* supported an additional 1.4 million jobs in the national economy. Combining the operational and capital investment impacts, the oil and natural gas industry's total employment impact on the national economy amounted to 10.8 million full-time and part-time jobs in 2021, accounting for 5.4 percent of total US employment.

Labor Income

The associated labor income (including wages and salaries and benefits as well as proprietors' income) from jobs directly or indirectly supported by the oil and natural gas industry through its

operations, capital investment, and household spending out of dividend payments is estimated to be \$908.7 billion, or 6.4 percent of total US labor income in 2021.

Value Added

Value added refers to the additional value created at a particular stage of production. The sum of value added across all industries in a country or region is, by definition, equivalent to its Gross Domestic Product (GDP). Value added consists of: employee compensation, proprietors' income, income to capital owners from property, and indirect business taxes (i.e., those borne by consumers rather than producers).

PwC estimates that the US oil and natural gas industry's *operations* directly or indirectly generated \$1.6 trillion of value added in the national economy in 2021, and its *capital investment* added an additional \$156.0 billion of value added. Combining both operational and capital investment impacts, the industry's total value-added impact at the national level was nearly \$1.8 trillion, accounting for 7.6 percent of US GDP in 2021.

Distribution of Indirect and Induced Activity

The indirect and induced economic activity occurs across a broad range of other industries. For employment, 54.8 percent of the indirect and induced impact attributable to the industry's operational expenditures is in the services sector. Another 11.9 percent is in the finance, insurance, real estate, rental, and leasing sector. The indirect and induced impact on employment attributable to the industry's capital expenditures is mostly concentrated in services, construction, and wholesale and retail trade (see **Table 4a**, below).

For labor income, 52.8 percent of the indirect and induced impact attributable to the industry's operational expenditures is in the services sector, and another 12.7 percent is in the finance, insurance, real estate, rental, and leasing sector. The indirect and induced impact to labor income attributable to the industry's capital expenditures is mostly concentrated in services, construction, wholesale and retail trade, and manufacturing (see **Table 4b**, below).

For value added, the services sector accounted for 39.6 percent of the indirect and induced impact attributable to the industry's operational expenditures. Finance, real estate, rental, and leasing accounted for another 24.1 percent. The indirect and induced impact to value added attributable to the industry's capital expenditures is mostly concentrated in services, finance, real estate, rental, and leasing, wholesale and retail trade, manufacturing, and construction (see **Table 4c**, below).

Table 4a. Distribution of Indirect and Induced Activity Generated by the US Oil and Natural Gas Industry, 2021: Employment

Industry Impacted	Indirect and Induced Impacts	
	Operational	Capital
Total (in thousands)	7,104	1,387
Agriculture, forestry and fishing	1.2%	0.9%
Mining	0.2%	0.1%
Utilities	0.6%	0.2%
Construction	2.4%	19.1%
Manufacturing	4.7%	9.5%
Wholesale and retail trade	10.5%	15.8%
Transportation and warehousing	10.0%	5.4%
Information	1.7%	1.6%
Finance, insurance, real estate, rental and leasing	11.9%	8.8%
Services	54.8%	38.2%
Other	1.9%	0.3%
Total	100%	100%

Source: PwC calculations using the IMPLAN modeling system and data from US Census Bureau. Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

Table 4b. Distribution of Indirect and Induced Activity Generated by the US Oil and Natural Gas Industry, 2021: Labor Income

Industry Impacted	Indirect and Induced Impacts	
	Operational	Capital
Total (\$ billions)	\$526.9	\$103.3
Agriculture, forestry and fishing	0.7%	0.5%
Mining	0.2%	0.2%
Utilities	1.6%	0.6%
Construction	2.3%	18.2%
Manufacturing	5.6%	11.9%
Wholesale and retail trade	9.1%	14.3%
Transportation and warehousing	8.3%	4.5%
Information	4.1%	3.9%
Finance, insurance, real estate, rental and leasing	12.7%	9.4%
Services	52.8%	36.1%
Other	2.3%	0.4%
Total	100%	100%

Source: PwC calculations using the IMPLAN modeling system and data from US Census Bureau. Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Table 4c. Distribution of Indirect and Induced Activity Generated by the US Oil and Natural Gas Industry, 2021: Value Added

Industry Impacted	Indirect and Induced Impacts	
	Operational	Capital
Total (\$ billions)	\$844.5	\$156.0
Agriculture, forestry and fishing	0.6%	0.5%
Mining	0.4%	0.4%
Utilities	3.0%	1.2%
Construction	1.8%	12.9%
Manufacturing	7.1%	13.6%
Wholesale and retail trade	10.1%	14.9%
Transportation and warehousing	6.0%	3.5%
Information	5.5%	5.6%
Finance, insurance, real estate, rental and leasing	24.1%	18.2%
Services	39.6%	28.9%
Other	1.9%	0.5%
Total	100%	100%

Source: PwC calculations using the IMPLAN modeling system and data from US Census Bureau.

B. State Results

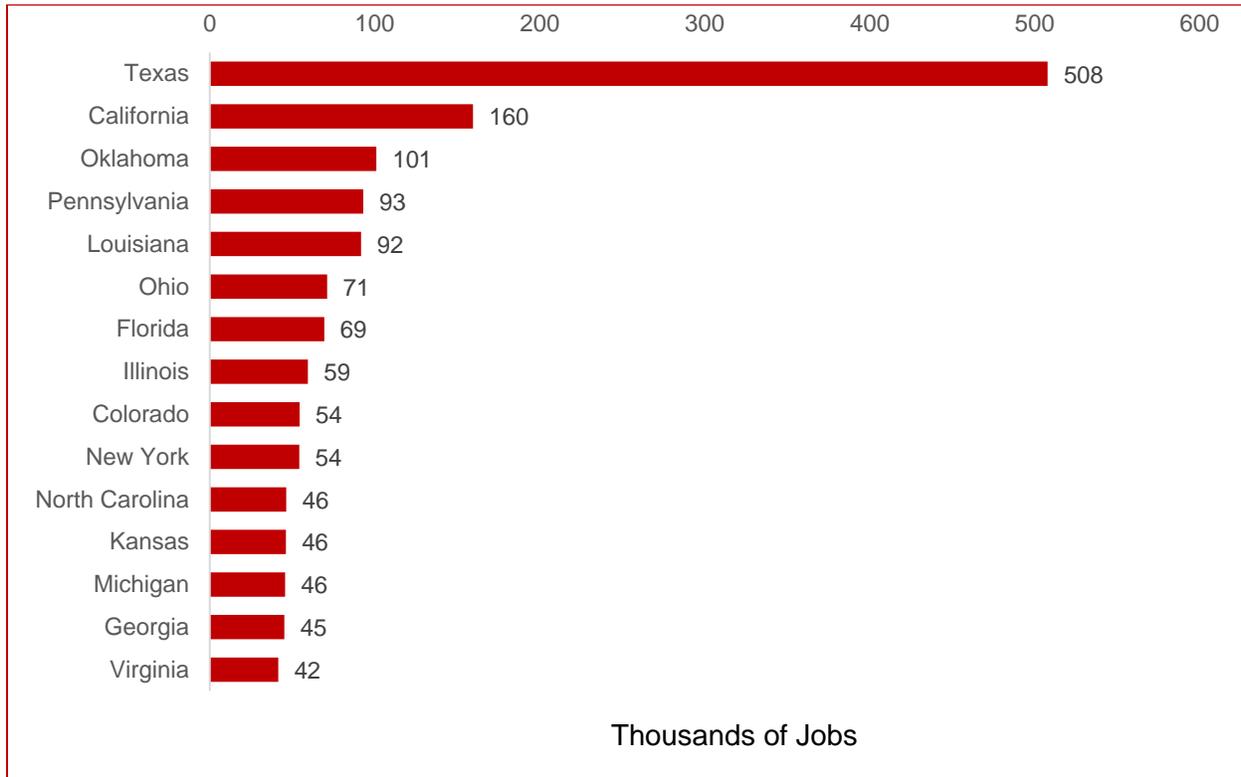
The economic impact of the oil and natural gas industry at the state level reflects the indirect and induced effects attributable to direct activity within each state's borders, as well as indirect and induced activity within a state that is attributable to direct activity in other states.⁹

The economic impact of the oil and natural gas industry varies from state to state, depending on factors such as each state's population, natural resources, industry mix, wage structure, spending and saving patterns, and connections to other economies. In terms of direct impact of the oil and natural gas industry, **Figures 1, 2, and 3**, below, present employment, labor income, and value added for the top 15 states ranked by direct impacts (details for all states are available in **Appendix B**).

The figures indicate that Texas ranks substantially above all other states in terms of direct impacts of the oil and natural gas industry, with 507,800 jobs, \$100.9 billion of labor income, and \$244.1 billion of value added contributed in 2021. Other states with exceptionally large direct impacts include California, Oklahoma, Pennsylvania, and Louisiana, each with more than 90,000 jobs directly attributable to the oil and natural gas industry. These states have vast oil and natural gas deposits on and off shore that have led to substantial upstream and downstream operations.

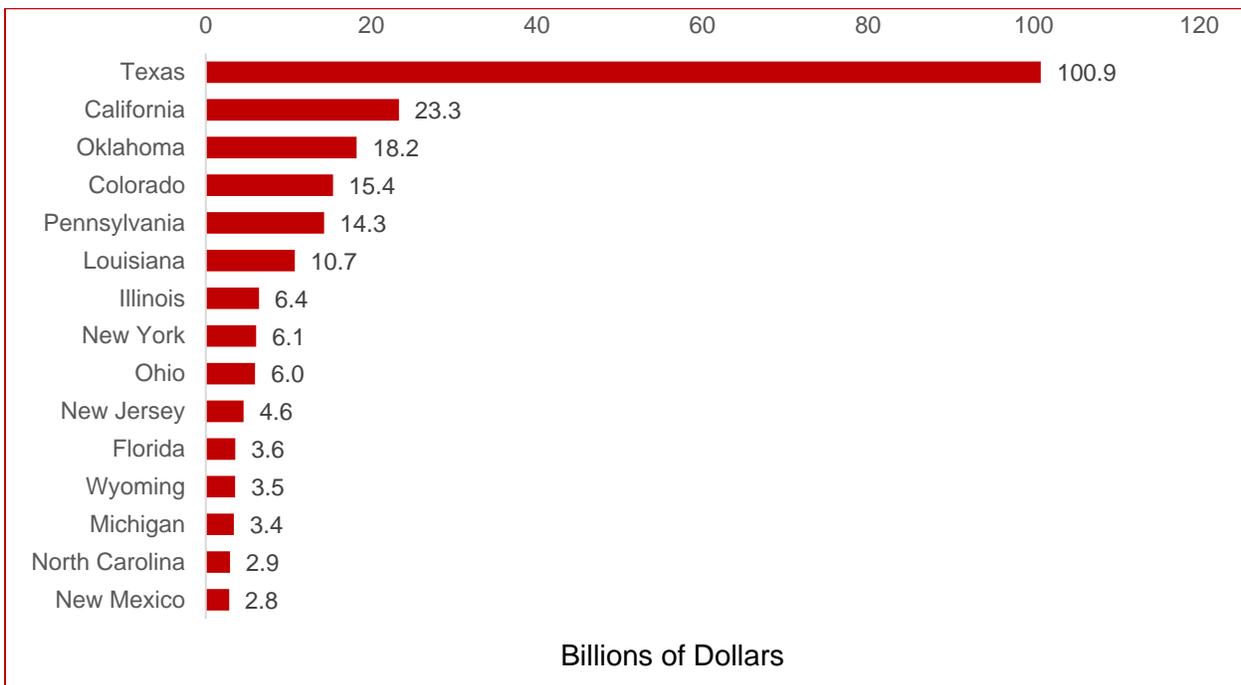
⁹ We have allocated the indirect and induced effects by industry attributable to direct activity in other states based on the overall level of economic activity of that industry in each state.

Figure 1. The Oil and Natural Gas Industry’s Direct Impact: Top 15 States by Direct Employment, 2021



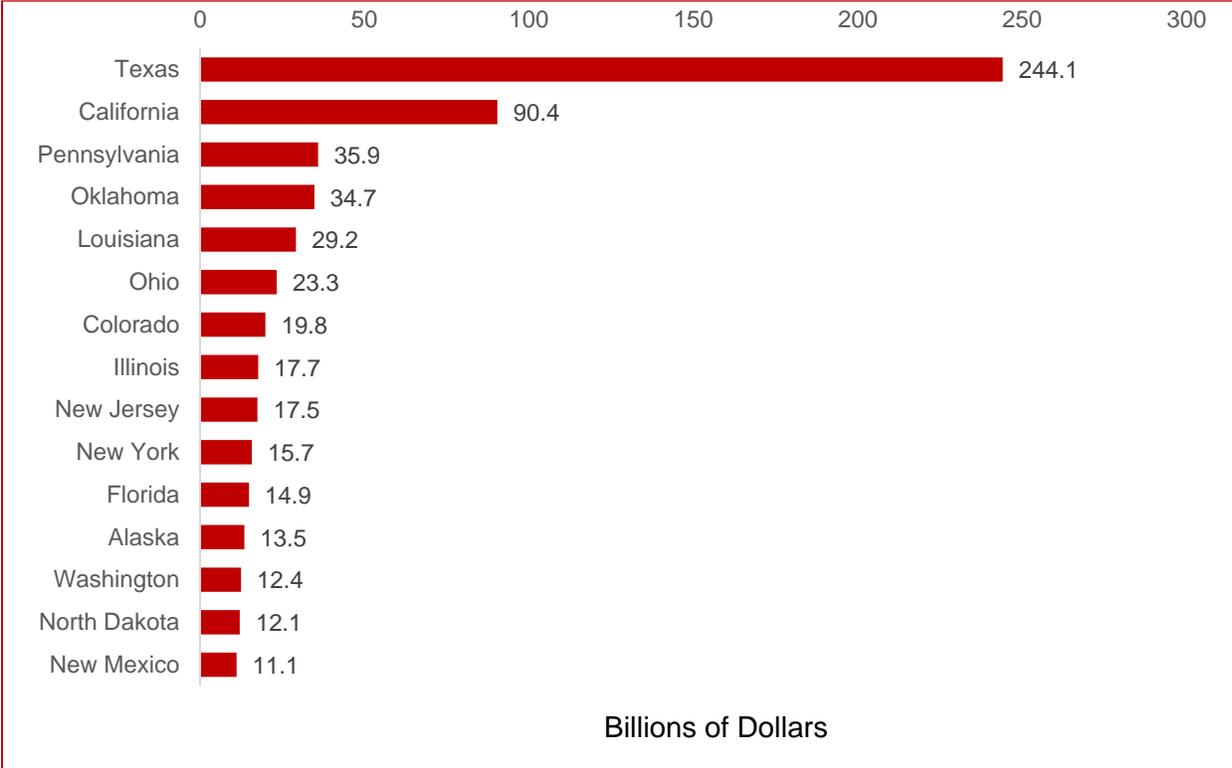
Source: PwC calculations based on the IMPLAN model. See Appendix B for underlying figures.

Figure 2. The Oil and Natural Gas Industry’s Direct Impact: Top 15 States by Direct Labor Income, 2021



Source: PwC calculations based on the IMPLAN model. See Appendix B for underlying figures.

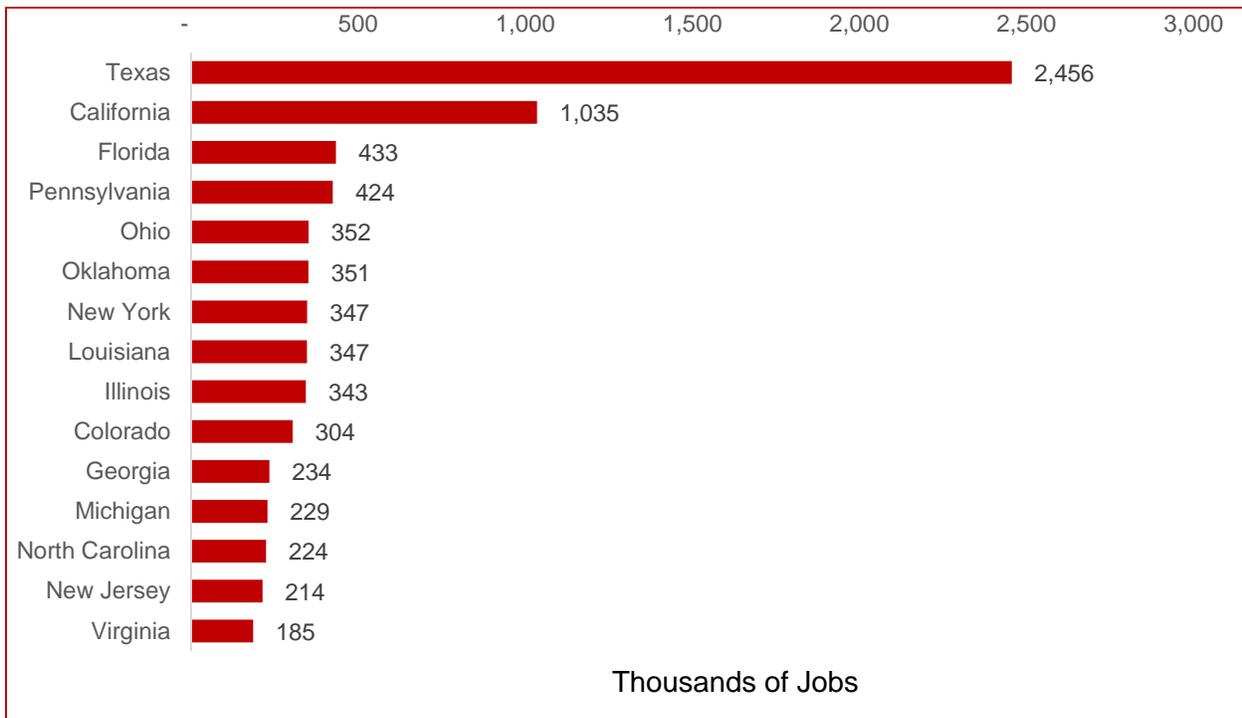
Figure 3. The Oil and Natural Gas Industry’s Direct Impact: Top 15 States by Direct Value Added, 2021



Source: PwC calculations based on the IMPLAN model. See Appendix B for underlying figures.

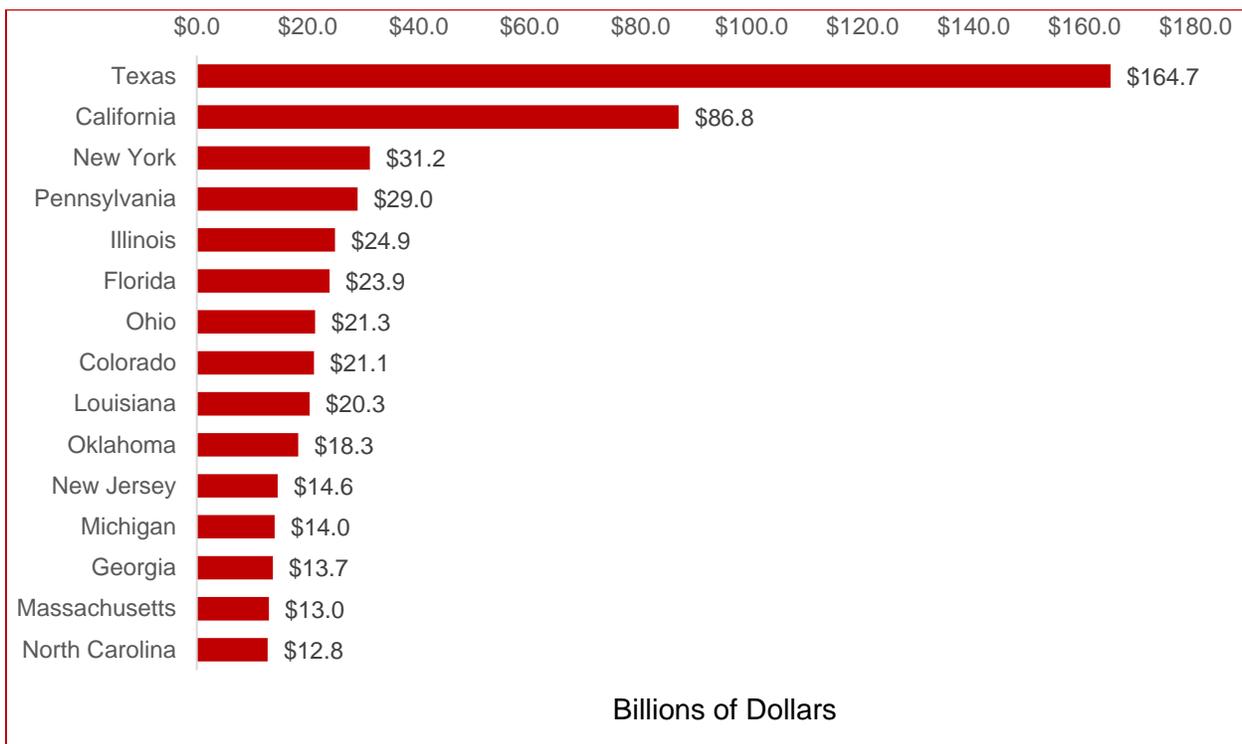
Figures 4 through **9**, below, present the total impact of the oil and natural gas industry by state, including direct, indirect, and induced impacts. Looking at the top 15 states in terms of total employment attributable to the oil and natural gas industry, **Figure 4**, below, indicates that Texas ranks highest by this measure as well, followed by California, Florida, and Pennsylvania. These states also rank high in terms of labor income and value added attributable to the oil and natural gas industry (see **Figures 5** and **6**, below). These states have the highest amounts of activities directly or indirectly attributable to the oil and natural gas industry in part because they also are among the largest economies in the country.

Figure 4. The Oil and Natural Gas Industry’s Total Impact: Top 15 States by Total Employment Impact, 2021



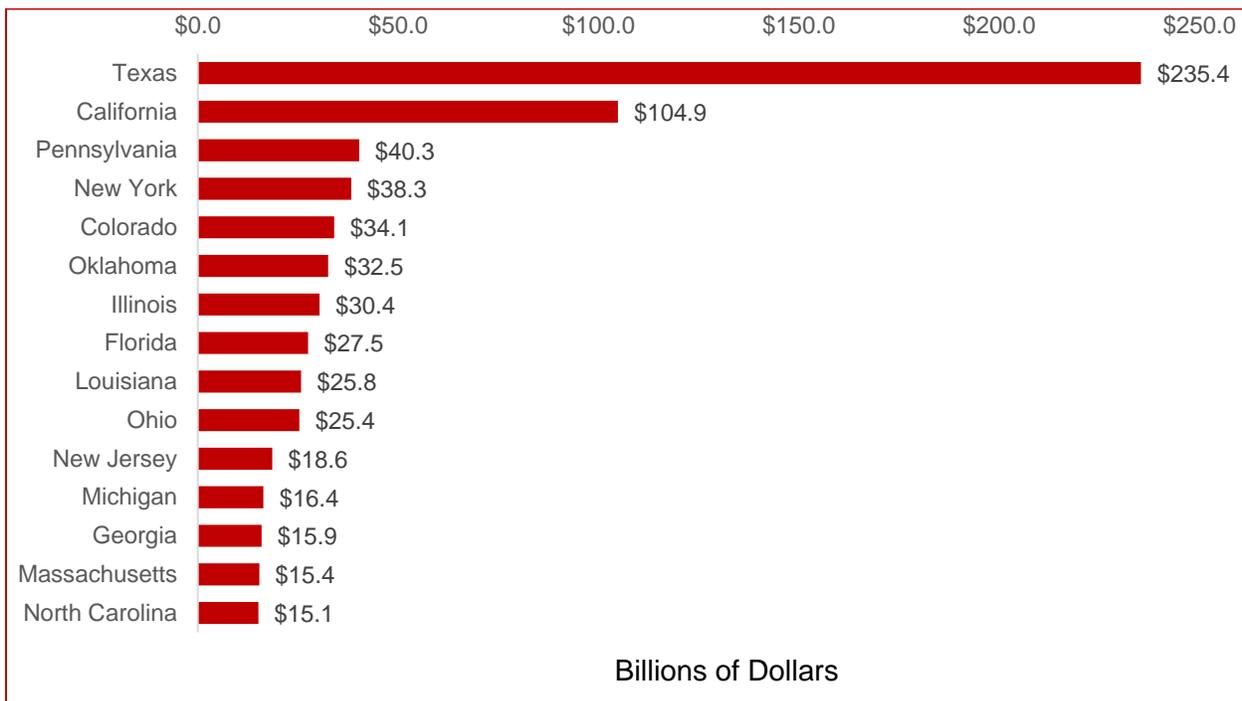
Source: PwC calculations based on the IMPLAN model. See Appendix B for underlying figures.

Figure 5. The Oil and Natural Gas Industry’s Total Impact: Top 15 States by Total Labor Income Impact, 2021



Source: PwC calculations based on the IMPLAN model. See Appendix B for underlying figures.

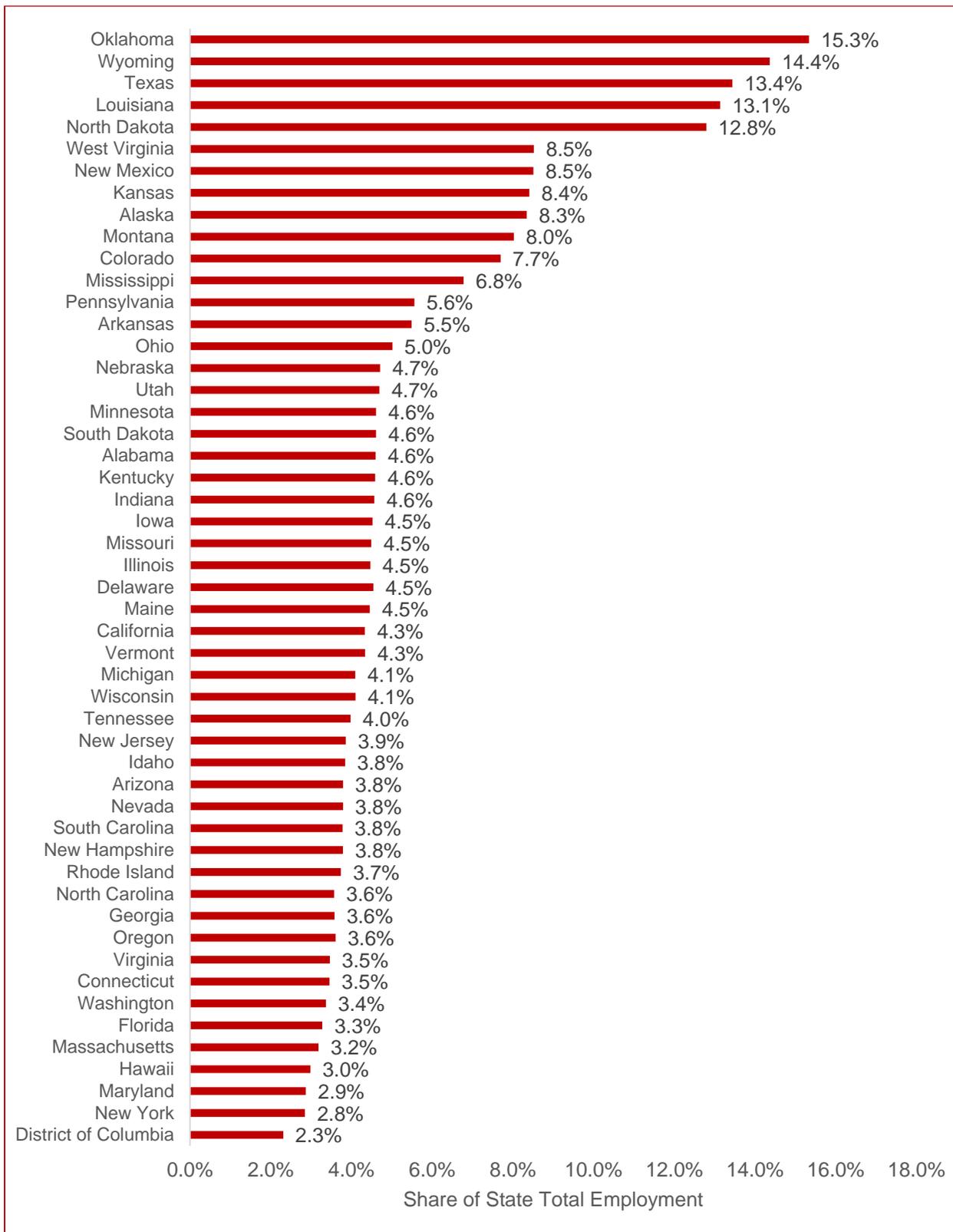
Figure 6. The Oil and Natural Gas Industry’s Total Impact: Top 15 States by Total Value Added Impact, 2021



Source: PwC calculations based on the IMPLAN model. See Appendix B for underlying figures.

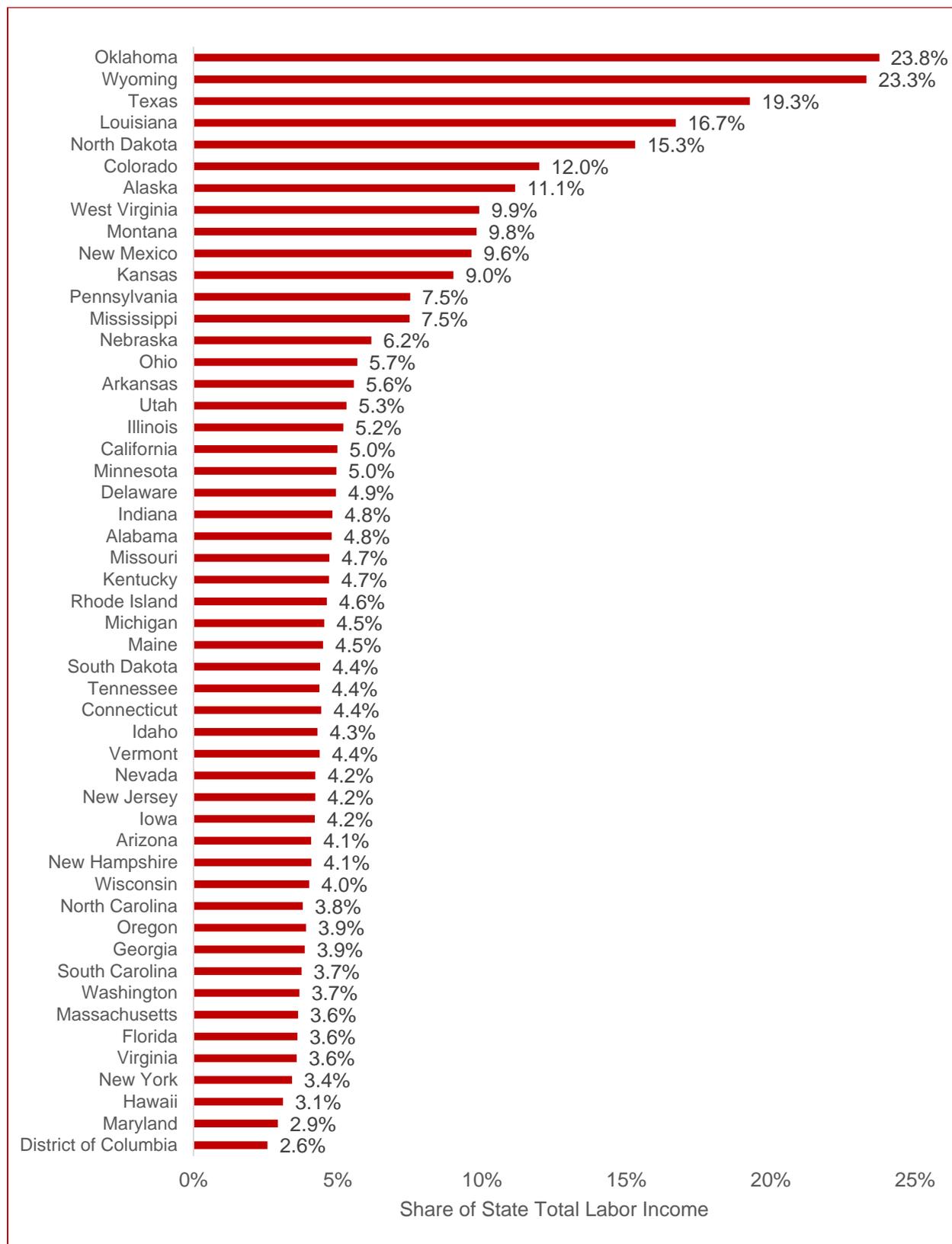
Looking at all states in terms of the share of state employment directly and indirectly attributable to the oil and natural gas industry, **Figure 7**, below, indicates that Oklahoma ranks highest, followed by Wyoming, Texas, Louisiana, and North Dakota. In each of these states, the oil and natural gas industry directly and indirectly contributed more than 10 percent of state employment in 2021. These states also rank high in terms of the share of state labor income and value added directly and indirectly attributable to the oil and natural gas industry (see **Figures 8 and 9**, below). These states, which have large oil and natural gas deposits, produce much of the country's domestic energy supply. The District of Columbia, New York, and Maryland are three study areas with the smallest shares of economic activity attributable to the oil and natural gas industry.

Figure 7. The Oil and Natural Gas Industry’s Total Employment Impact as a Share of State Employment, 2021



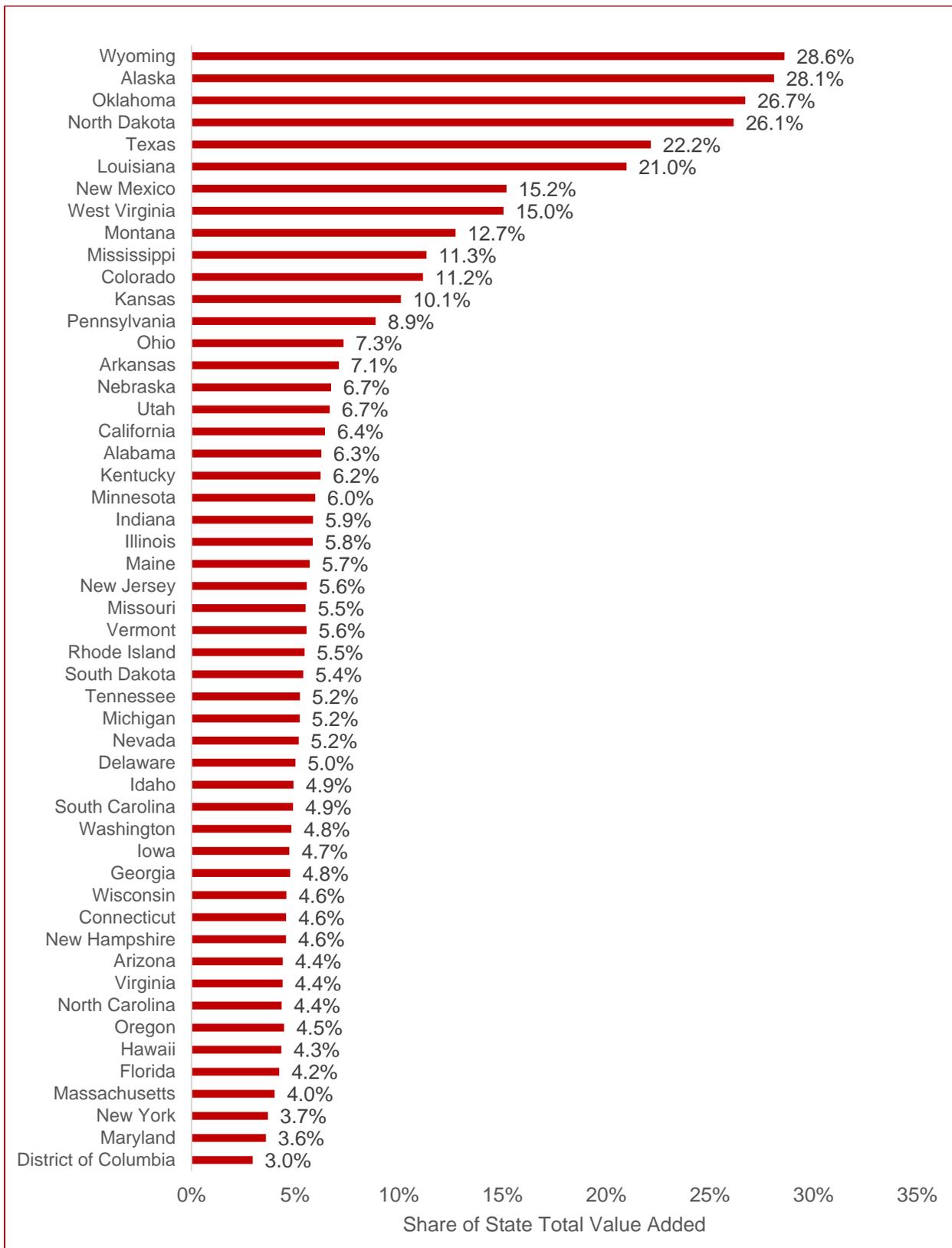
Source: PwC calculations based on the IMPLAN model. See Appendix B for underlying figures.

Figure 8. The Oil and Natural Gas Industry’s Total Labor Income Impact as a Share of State Labor Income, 2021



Source: PwC calculations based on the IMPLAN model. See Appendix B for underlying figures.

Figure 9. The Oil and Natural Gas Industry’s Total Value-Added Impact as a Share of State GDP, 2021



Source: PwC calculations based on the IMPLAN model. See Appendix B for underlying figures.

C. Congressional District Results

The economic impact of the oil and natural gas industry at the congressional district level reflects the indirect and induced effects attributable to direct activity within each congressional district's borders, as well as indirect and induced activity within a congressional district that is attributable to direct activity in other congressional districts.¹⁰

The oil and natural gas industry's activity varies considerably across congressional districts. The number of jobs directly attributable to the oil and natural gas industry was at least 1,000 in all but 11 districts and exceeded 5,000 in 121 congressional districts in 2021. Direct employment is especially pronounced in districts in Texas, Oklahoma, and Louisiana with significant oil and gas extraction activities.

Table 5, below, presents employment, labor income, and value added for the top 15 congressional districts ranked by direct employment. Nine of the top 15 districts in terms of the oil and natural gas industry's direct employment are in Texas, home to the two of America's largest oil fields (the Permian Basin and the Eagle Ford).

Leading all districts in direct employment is Texas's 11th Congressional District, which encompasses all or part of 29 counties in west central Texas, stretching from the Permian Basin through the Hill Country to the outer fringes of Dallas-Fort Worth, including the top crude oil producing county of Midland. Texas's 7th Congressional District includes portions of Harris, Fort Bend, and Brazoria counties, which are all located within the Gulf Coast region of Texas. Texas's 38th Congressional District, the newest addition after the 2020 Census Redistricting, stretches from the Energy Corridor in western Harris County northwards to Cypress and Tomball. It includes the Houston suburbs of Jersey Village, Cypress, Tomball, Katy, and Klein. The Memorial Villages and a portion of the city of Houston are also located within the district.

Oklahoma's 3rd Congressional District includes Oklahoma City and many of its suburbs and is home to the Anadarko Basin and the Arbuckle-Simpson Aquifer, which are known for oil and gas production. Oklahoma's 5th Congressional District is located in Central Oklahoma and includes parts of Oklahoma, Pottawatomie, and Seminole counties, as well as the eastern portion of Canadian County.

North Dakota's At-Large District covers the majority of the Bakken region, another key oil-producing basin in the country.

Louisiana's 3rd Congressional District covers the southwestern and south-central portion of the state. Many of the nation's largest oil fields are found in the federal Outer Continental Shelf ("OCS") off the Louisiana coast, with a large share of federal OCS production in the Gulf of Mexico coming onshore in Louisiana.

Direct employment in the top 15 congressional districts for the oil and natural gas industry was 428,660 in 2021, or about 19.0 percent of direct employment nationwide in the oil and natural gas industry.

In terms of total impacts (including indirect, indirect, and induced impacts), the oil and natural gas industry supported more than 10,000 jobs in all but four congressional districts in 2021.

¹⁰ We have allocated the indirect and induced effects by industry attributable to direct activity in other congressional districts within a state based on the overall level of economic activity of that industry in each congressional district in the state.

**Table 5. The Oil and Natural Gas Industry's Direct Impact, 2021:
Top 15 Congressional Districts, Ranked by Employment**

Rank	CD	Employment ⁽¹⁾		Labor Income ⁽²⁾		Value Added	
		Amount (Jobs)	Share of US ⁽³⁾	Amount (\$ Million)	Share of US ⁽³⁾	Amount (\$ Million)	Share of US ⁽³⁾
1	TX-11	65,590	2.9%	\$17,350	6.2%	\$36,670	4.7%
2	TX-7	46,440	2.1%	\$8,942	3.2%	\$18,860	2.4%
3	TX-38	31,580	1.4%	\$5,726	2.1%	\$24,012	3.1%
4	OK-3	29,430	1.3%	\$2,519	0.9%	\$7,200	0.9%
5	ND-1 (At-Large)	27,150	1.2%	\$2,661	1.0%	\$12,086	1.6%
6	LA-3	27,140	1.2%	\$2,613	0.9%	\$6,777	0.9%
7	OK-5	26,990	1.2%	\$8,793	3.2%	\$13,742	1.8%
8	TX-23	24,750	1.1%	\$3,687	1.3%	\$10,389	1.3%
9	TX-29	23,960	1.1%	\$6,503	2.3%	\$12,991	1.7%
10	TX-27	23,180	1.0%	\$4,596	1.7%	\$12,856	1.7%
11	OK-1	21,630	1.0%	\$5,066	1.8%	\$9,377	1.2%
12	TX-19	20,510	0.9%	\$2,136	0.8%	\$6,940	0.9%
13	TX-36	20,460	0.9%	\$4,255	1.5%	\$12,663	1.6%
14	WY-1 (At-Large)	20,340	0.9%	\$3,548	1.3%	\$8,332	1.1%
15	TX-13	19,510	0.9%	\$2,361	0.8%	\$12,001	1.6%

Source: PwC calculations based on the IMPLAN model.

(1) Employment is defined as the number of direct, indirect, and induced payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Share of US refers to the share of the US oil and natural gas industry's direct impact at the national level.

Table 6, below, presents employment, labor income, and value added for the top 15 congressional districts ranked by total employment impact, reflecting the oil and natural gas industry's direct, indirect, and induced impacts. Many of the same congressional districts that rank high in terms of direct employment also rank high in terms of total employment directly and indirectly attributable to the oil and natural gas industry. Total industry-supported employment in the top 15 congressional districts was 1.3 million in 2021, or 11.8 percent of total industry-supported employment nationwide.

Details for all congressional districts are available in **Appendix C**.

**Table 6. The Oil and Natural Gas Industry’s Total Impact, 2021:
Top 15 Congressional Districts, Ranked by Employment**

Rank	CD	Employment ⁽¹⁾		Labor Income ⁽²⁾		Value Added	
		Amount (Jobs)	Share of US ⁽³⁾	Amount (\$ Million)	Share of US ⁽³⁾	Amount (\$ Million)	Share of US ⁽³⁾
1	TX-11	128,250	1.2%	\$22,293	2.5%	\$45,748	2.6%
2	TX-7	111,050	1.0%	\$14,770	1.6%	\$27,708	1.6%
3	TX-38	98,060	0.9%	\$10,685	1.2%	\$32,965	1.9%
4	OK-5	86,340	0.8%	\$12,796	1.4%	\$20,356	1.1%
5	LA-3	84,080	0.8%	\$5,853	0.6%	\$11,963	0.7%
6	TX-13	83,650	0.8%	\$6,142	0.7%	\$18,568	1.0%
7	TX-27	83,260	0.8%	\$8,154	0.9%	\$19,178	1.1%
8	OK-1	79,650	0.7%	\$9,084	1.0%	\$15,491	0.9%
9	OK-3	79,280	0.7%	\$4,913	0.5%	\$11,171	0.6%
10	TX-26	77,070	0.7%	\$5,584	0.6%	\$10,220	0.6%
11	TX-19	75,400	0.7%	\$5,051	0.6%	\$11,402	0.6%
12	ND-1 (At-Large)	72,460	0.7%	\$5,580	0.6%	\$16,618	0.9%
13	TX-12	71,030	0.7%	\$7,728	0.9%	\$13,589	0.8%
14	TX-23	70,210	0.7%	\$6,507	0.7%	\$14,959	0.8%
15	TX-1	69,210	0.6%	\$5,787	0.6%	\$11,441	0.6%

Source: PwC calculations based on the IMPLAN model.

(1) Employment is defined as the number of direct, indirect, and induced payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors’ income.

(3) Share of US refers to the share of the oil and natural gas industry’s total impact at the national level.

IV. Wages, Capital Spending, and Dividends from the Oil and Natural Gas Industry

As shown in the previous section, the US oil and natural gas industry’s direct labor income in 2021 is estimated to be \$279 billion.

Based on data from the US Census Bureau’s *Annual Capital Expenditure Survey*, the industry’s capital expenditures are estimated to be \$159 billion in 2021.¹¹

Total dividends paid by publicly traded companies in the industry were obtained from S&P’s *Capital IQ*® database. The measure of dividends used includes cash dividends paid to US shareholders from all classes of common stock out of income from US operations by publicly traded US corporations in the oil and natural gas industry. It also includes dividends paid to US shareholders out of income from US operations by publicly traded foreign corporations in the industry.¹² Excluding distributions from Master Limited Partnerships and other pass-through entities,¹³ PwC estimates that the publicly traded companies in the industry paid out a total of \$33 billion in dividends in 2021 to US households and retirement plans.¹⁴

One measure of the industry’s total “spend” is the sum of the industry’s expenditures on labor and capital and its payments of dividends. Using this measure, the industry’s total US “spend” amounted to \$471 billion in 2021, as shown in **Table 7**, below.

Table 7. The Oil and Natural Gas Industry’s Total US Spend in 2021
(Billions of dollars)

Labor Income	Capital Spending	Dividend Payout	Total Spend
\$279	\$159	\$33	\$471

Sources: PwC calculations based on the IMPLAN model, the US Census Bureau’s *Annual Capital Expenditure Survey*, and S&P’s *Capital IQ*® database.

¹¹ The Census Bureau defines capital expenditures to include “all capitalized costs” incurred during the year for structures and equipment “chargeable to asset accounts, and for which depreciation and amortization accounts are ordinarily maintained.”

¹² The measure of dividends used includes cash dividends from all classes of common stock, cash paid in lieu of fractional shares, liquidation payments to shareholders and other cash distributions to shareholders. It does not include the dollar value of stock dividends or dividends paid or accrued on preferred stock.

¹³ Distributions from pass-through entities are included as proprietors’ income in PwC’s estimate of direct labor income.

¹⁴ Additionally, the publicly traded companies in the industry paid out \$4 billion to US finance and insurance companies and other businesses.

Appendix A: Direct Impact by Detailed Sector

Table A-1. Direct Impact of the Oil and Natural Gas Industry on the US Economy by Subsector, 2021

NAICS Code	Subsector Description	Employment ⁽¹⁾ (000's)	Labor Income ⁽²⁾ (\$ billions)	Value Added (\$ billions)
211	Oil and gas extraction (including NGL extraction)	428	\$79	\$239
213111	Drilling oil and gas wells	44	\$5	\$6
213112	Support activities for oil and gas operations	210	\$21	\$26
2212	Natural gas distribution	129	\$26	\$76
23712	Oil and gas pipeline and related structures construction	137	\$14	\$16
32411	Petroleum refineries	64	\$19	\$112
32412	Asphalt paving, roofing and saturated materials manufacturing	29	\$6	\$11
324191	Petroleum lubricating oil and grease manufacturing	12	\$2	\$5
4247	Petroleum and petroleum products merchant wholesalers	100	\$11	\$153
44711, 44719	Gasoline stations	980	\$46	\$76
45431	Fuel dealers	76	\$5	\$9
486	Pipeline transportation	49	\$43	\$45
	Total US Oil and Natural Gas Industry	2,258	\$279	\$774

Source: Estimates based on 2021 employment data from the US Bureau of Economic Analysis and supplemented by data from the US Bureau of Labor Statistics and US Census Bureau and 2021 input-output relationships from the IMPLAN modeling system.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Appendix B: Detailed Results by State

Table B-1. The Oil and Natural Gas Industry's Economic Impact by State, 2021
(Thousands of jobs; Billions of dollars)

State	Employment		Labor Income		Value Added	
	Direct	Total	Direct	Total	Direct	Total
US Total	2,258	10,750	\$278.5	\$908.7	\$773.6	\$1,774.1
Alabama	32	126	\$1.9	\$7.5	\$6.6	\$15.9
Alaska	12	37	\$2.1	\$3.7	\$13.5	\$16.1
Arizona	28	154	\$1.9	\$10.6	\$4.5	\$18.5
Arkansas	25	92	\$1.1	\$5.1	\$3.9	\$10.6
California	160	1035	\$23.3	\$104.9	\$90.4	\$217.1
Colorado	54	304	\$15.4	\$34.1	\$19.8	\$48.7
Connecticut	14	79	\$2.2	\$8.2	\$4.2	\$13.6
Delaware	6	28	\$0.5	\$2.0	\$1.0	\$4.1
District of Columbia	2	20	\$0.5	\$2.9	\$1.1	\$4.5
Florida	69	433	\$3.6	\$27.5	\$14.9	\$53.1
Georgia	45	234	\$2.6	\$15.9	\$10.8	\$32.9
Hawaii	4	25	\$0.3	\$1.8	\$1.5	\$3.9
Idaho	10	43	\$0.7	\$2.7	\$1.6	\$4.7
Illinois	59	343	\$6.4	\$30.4	\$17.7	\$55.3
Indiana	37	180	\$2.5	\$12.3	\$8.5	\$24.2
Iowa	28	93	\$1.1	\$5.2	\$3.0	\$10.2
Kansas	46	161	\$2.6	\$10.6	\$6.9	\$19.3
Kentucky	28	117	\$1.4	\$6.9	\$6.0	\$14.8
Louisiana	92	347	\$10.7	\$25.8	\$29.2	\$54.3
Maine	11	38	\$0.6	\$2.2	\$1.7	\$4.4
Maryland	18	107	\$1.2	\$8.1	\$4.9	\$15.9
Massachusetts	25	152	\$2.7	\$15.4	\$6.7	\$25.7
Michigan	46	229	\$3.4	\$16.4	\$9.6	\$29.9
Minnesota	39	170	\$2.6	\$13.0	\$8.7	\$24.6
Mississippi	31	109	\$2.0	\$5.9	\$7.9	\$14.4
Missouri	42	170	\$2.3	\$10.8	\$6.1	\$19.7
Montana	14	57	\$1.2	\$3.7	\$3.7	\$7.5
Nebraska	14	63	\$2.0	\$5.1	\$4.5	\$9.9
Nevada	14	71	\$1.1	\$4.9	\$3.7	\$10.1
New Hampshire	8	34	\$0.6	\$2.8	\$1.2	\$4.5
New Jersey	37	214	\$4.6	\$18.6	\$17.5	\$38.0
New Mexico	36	93	\$2.8	\$6.0	\$11.1	\$16.6
New York	54	347	\$6.1	\$38.3	\$15.7	\$70.1
North Carolina	46	224	\$2.9	\$15.1	\$8.0	\$28.8
North Dakota	27	72	\$2.7	\$5.6	\$12.1	\$16.6
Ohio	71	352	\$6.0	\$25.4	\$23.3	\$55.5
Oklahoma	101	351	\$18.2	\$32.5	\$34.7	\$57.5
Oregon	17	92	\$1.4	\$7.0	\$3.6	\$12.2
Pennsylvania	93	424	\$14.3	\$40.3	\$35.9	\$75.0
Rhode Island	5	24	\$0.6	\$2.0	\$1.4	\$3.6
South Carolina	27	110	\$1.1	\$6.2	\$4.8	\$13.2
South Dakota	9	29	\$0.4	\$1.7	\$1.2	\$3.3
Tennessee	36	169	\$2.7	\$12.2	\$7.6	\$22.4
Texas	508	2456	\$100.9	\$235.4	\$244.1	\$454.5
Utah	20	105	\$1.6	\$7.2	\$5.8	\$15.0
Vermont	5	18	\$0.3	\$1.1	\$0.8	\$2.1
Virginia	42	185	\$2.5	\$13.7	\$8.6	\$26.6
Washington	24	154	\$2.2	\$14.4	\$12.4	\$32.7
West Virginia	25	73	\$1.9	\$4.8	\$8.1	\$12.9
Wisconsin	38	151	\$1.8	\$9.4	\$4.7	\$16.9
Wyoming	20	59	\$3.5	\$5.7	\$8.3	\$11.9

Source: PwC calculations based on the IMPLAN model.

Note: Details may not add up to totals due to rounding.

Table B-2. The Oil and Natural Gas Industry's Total Economic Impact as a Share of State Total, 2021
(Percentage of State Total)

State	Industry Supported Total Employment / State Total Employment	Industry Supported Total Labor Income / State Total Labor Income	Industry Supported Total Value Added / State Total GDP
Alabama	4.6%	4.8%	6.3%
Alaska	8.3%	11.1%	28.1%
Arizona	3.8%	4.1%	4.4%
Arkansas	5.5%	5.6%	7.1%
California	4.3%	5.0%	6.4%
Colorado	7.7%	12.0%	11.2%
Connecticut	3.5%	4.4%	4.6%
Delaware	4.5%	4.9%	5.0%
District of Columbia	2.3%	2.6%	3.0%
Florida	3.3%	3.6%	4.2%
Georgia	3.6%	3.9%	4.8%
Hawaii	3.0%	3.1%	4.3%
Idaho	3.8%	4.3%	4.9%
Illinois	4.5%	5.2%	5.8%
Indiana	4.6%	4.8%	5.9%
Iowa	4.5%	4.2%	4.7%
Kansas	8.4%	9.0%	10.1%
Kentucky	4.6%	4.7%	6.2%
Louisiana	13.1%	16.7%	21.0%
Maine	4.5%	4.5%	5.7%
Maryland	2.9%	2.9%	3.6%
Massachusetts	3.2%	3.6%	4.0%
Michigan	4.1%	4.5%	5.2%
Minnesota	4.6%	5.0%	6.0%
Mississippi	6.8%	7.5%	11.3%
Missouri	4.5%	4.7%	5.5%
Montana	8.0%	9.8%	12.7%
Nebraska	4.7%	6.2%	6.7%
Nevada	3.8%	4.2%	5.2%
New Hampshire	3.8%	4.1%	4.6%
New Jersey	3.9%	4.2%	5.6%
New Mexico	8.5%	9.6%	15.2%
New York	2.8%	3.4%	3.7%
North Carolina	3.6%	3.8%	4.4%
North Dakota	12.8%	15.3%	26.1%
Ohio	5.0%	5.7%	7.3%
Oklahoma	15.3%	23.8%	26.7%
Oregon	3.6%	3.9%	4.5%
Pennsylvania	5.6%	7.5%	8.9%
Rhode Island	3.7%	4.6%	5.5%
South Carolina	3.8%	3.7%	4.9%
South Dakota	4.6%	4.4%	5.4%
Tennessee	4.0%	4.4%	5.2%
Texas	13.4%	19.3%	22.2%
Utah	4.7%	5.3%	6.7%
Vermont	4.3%	4.4%	5.6%
Virginia	3.5%	3.6%	4.4%
Washington	3.4%	3.7%	4.8%
West Virginia	8.5%	9.9%	15.0%
Wisconsin	4.1%	4.0%	4.6%
Wyoming	14.4%	23.3%	28.6%

Source: PwC calculations based on the IMPLAN model.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-3. The Economic Impact of the Oil and Natural Gas Industry in Alabama, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	31,880			31,880	1.2%
Indirect/Induced Impacts on Other Industries					
Services		19,360	23,920	43,280	
Wholesale and retail trade		3,850	6,970	10,820	
Finance, insurance, real estate, rental and leasing		4,570	5,180	9,750	
Transportation and warehousing		7,590	2,100	9,690	
Manufacturing		5,590	3,580	9,170	
Construction		5,260	370	5,630	
Government		1,020	720	1,740	
Agriculture		390	1,050	1,440	
Information		720	600	1,320	
Utilities		600	310	910	
Mining		210	30	240	
Total Impact on Employment	31,880	49,150	44,830	125,860	4.6%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,880			\$1,880	1.2%
Indirect/Induced Impacts on Other Industries					
Services		\$1,128	\$1,178	\$2,306	
Manufacturing		\$468	\$254	\$722	
Wholesale and retail trade		\$298	\$323	\$621	
Finance, insurance, real estate, rental and leasing		\$310	\$274	\$583	
Transportation and warehousing		\$419	\$121	\$539	
Construction		\$316	\$23	\$339	
Utilities		\$110	\$55	\$165	
Government		\$83	\$60	\$143	
Information		\$66	\$54	\$120	
Agriculture		\$13	\$28	\$41	
Mining		\$23	\$4	\$26	
Total Impact on Labor Income	\$1,880	\$3,233	\$2,373	\$7,486	4.8%
Value Added (\$ Millions)					
Industry Direct Impact	\$6,603			\$6,603	2.6%
Indirect/Induced Impacts on Other Industries					
Services		\$1,309	\$1,412	\$2,721	
Finance, insurance, real estate, rental and leasing		\$986	\$1,169	\$2,155	
Manufacturing		\$854	\$443	\$1,297	
Wholesale and retail trade		\$478	\$543	\$1,021	
Transportation and warehousing		\$505	\$158	\$663	
Utilities		\$297	\$150	\$447	
Construction		\$356	\$30	\$386	
Government		\$139	\$103	\$242	
Information		\$125	\$106	\$231	
Mining		\$72	\$11	\$83	
Agriculture		\$18	\$53	\$71	
Total Impact on Value Added	\$6,603	\$5,138	\$4,178	\$15,918	6.3%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-4. The Economic Impact of the Oil and Natural Gas Industry in Alaska, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	12,220			12,220	2.8%
Indirect/Induced Impacts on Other Industries					
Services		4,830	8,500	13,330	
Wholesale and retail trade		810	2,320	3,130	
Finance, insurance, real estate, rental and leasing		1,460	1,500	2,960	
Transportation and warehousing		1,080	500	1,580	
Construction		1,360	110	1,470	
Manufacturing		180	370	550	
Information		180	190	370	
Government		120	210	330	
Agriculture		40	260	300	
Utilities		210	80	290	
Mining		240	40	280	
Total Impact on Employment	12,220	10,510	14,080	36,820	8.3%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,053			\$2,053	6.2%
Indirect/Induced Impacts on Other Industries					
Services		\$345	\$539	\$884	
Wholesale and retail trade		\$54	\$115	\$169	
Finance, insurance, real estate, rental and leasing		\$88	\$80	\$168	
Construction		\$116	\$10	\$126	
Transportation and warehousing		\$83	\$39	\$122	
Utilities		\$32	\$13	\$45	
Government		\$15	\$25	\$41	
Information		\$17	\$18	\$35	
Manufacturing		\$9	\$24	\$34	
Mining		\$20	\$4	\$24	
Agriculture		\$2	\$10	\$12	
Total Impact on Labor Income	\$2,053	\$783	\$878	\$3,713	11.1%
Value Added (\$ Millions)					
Industry Direct Impact	\$13,472			\$13,472	23.5%
Indirect/Induced Impacts on Other Industries					
Services		\$409	\$637	\$1,046	
Finance, insurance, real estate, rental and leasing		\$251	\$411	\$662	
Wholesale and retail trade		\$88	\$176	\$265	
Construction		\$138	\$14	\$151	
Transportation and warehousing		\$102	\$48	\$150	
Utilities		\$73	\$29	\$102	
Mining		\$69	\$12	\$81	
Information		\$36	\$40	\$77	
Manufacturing		\$14	\$31	\$45	
Government		\$17	\$28	\$44	
Agriculture		\$2	\$16	\$18	
Total Impact on Value Added	\$13,472	\$1,197	\$1,443	\$16,113	28.1%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-5. The Economic Impact of the Oil and Natural Gas Industry in Arizona, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	28,440			28,440	0.7%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		25,480	37,580	63,060	
<i>Finance, insurance, real estate, rental and leasing</i>		6,380	9,410	15,790	
<i>Wholesale and retail trade</i>		4,450	9,770	14,220	
<i>Transportation and warehousing</i>		8,050	3,810	11,860	
<i>Construction</i>		6,360	540	6,900	
<i>Manufacturing</i>		3,470	2,480	5,950	
<i>Information</i>		1,470	1,790	3,260	
<i>Government</i>		750	1,030	1,780	
<i>Agriculture</i>		260	890	1,150	
<i>Utilities</i>		530	310	840	
<i>Mining</i>		490	90	580	
Total Impact on Employment	28,440	57,690	67,700	153,840	3.8%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,851			\$1,851	0.7%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$1,889	\$2,208	\$4,097	
<i>Finance, insurance, real estate, rental and leasing</i>		\$502	\$580	\$1,082	
<i>Wholesale and retail trade</i>		\$380	\$566	\$947	
<i>Transportation and warehousing</i>		\$398	\$199	\$597	
<i>Manufacturing</i>		\$356	\$204	\$560	
<i>Information</i>		\$230	\$257	\$487	
<i>Construction</i>		\$427	\$37	\$464	
<i>Utilities</i>		\$107	\$62	\$169	
<i>Government</i>		\$72	\$95	\$166	
<i>Mining</i>		\$57	\$11	\$68	
<i>Agriculture</i>		\$13	\$53	\$67	
Total Impact on Labor Income	\$1,851	\$4,431	\$4,273	\$10,555	4.1%
Value Added (\$ Millions)					
Industry Direct Impact	\$4,515			\$4,515	1.1%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$2,226	\$2,646	\$4,872	
<i>Finance, insurance, real estate, rental and leasing</i>		\$1,340	\$2,058	\$3,398	
<i>Wholesale and retail trade</i>		\$567	\$986	\$1,553	
<i>Manufacturing</i>		\$638	\$375	\$1,013	
<i>Transportation and warehousing</i>		\$510	\$293	\$803	
<i>Information</i>		\$364	\$406	\$770	
<i>Construction</i>		\$505	\$55	\$560	
<i>Utilities</i>		\$302	\$177	\$478	
<i>Government</i>		\$100	\$134	\$234	
<i>Mining</i>		\$193	\$35	\$228	
<i>Agriculture</i>		\$16	\$63	\$79	
Total Impact on Value Added	\$4,515	\$6,761	\$7,228	\$18,504	4.4%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-6. The Economic Impact of the Oil and Natural Gas Industry in Arkansas, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	24,610			24,610	1.5%
Indirect/Induced Impacts on Other Industries					
Services		15,970	16,720	32,690	
Wholesale and retail trade		2,580	4,600	7,180	
Finance, insurance, real estate, rental and leasing		3,480	3,290	6,770	
Transportation and warehousing		5,040	1,450	6,490	
Manufacturing		2,920	2,620	5,540	
Construction		3,610	250	3,860	
Agriculture		380	1,350	1,730	
Government		1,050	530	1,580	
Information		500	350	850	
Utilities		400	150	550	
Mining		120	20	140	
Total Impact on Employment	24,610	36,060	31,330	92,000	5.5%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,078			\$1,078	1.2%
Indirect/Induced Impacts on Other Industries					
Services		\$1,091	\$855	\$1,946	
Transportation and warehousing		\$311	\$91	\$402	
Wholesale and retail trade		\$177	\$207	\$384	
Manufacturing		\$219	\$164	\$382	
Finance, insurance, real estate, rental and leasing		\$197	\$159	\$356	
Construction		\$188	\$13	\$202	
Government		\$73	\$38	\$111	
Information		\$48	\$33	\$81	
Utilities		\$58	\$22	\$80	
Agriculture		\$11	\$29	\$40	
Mining		\$8	\$1	\$9	
Total Impact on Labor Income	\$1,078	\$2,380	\$1,613	\$5,071	5.6%
Value Added (\$ Millions)					
Industry Direct Impact	\$3,897			\$3,897	2.6%
Indirect/Induced Impacts on Other Industries					
Services		\$1,316	\$1,044	\$2,360	
Finance, insurance, real estate, rental and leasing		\$666	\$692	\$1,358	
Manufacturing		\$471	\$312	\$783	
Wholesale and retail trade		\$351	\$405	\$757	
Transportation and warehousing		\$394	\$118	\$512	
Utilities		\$198	\$78	\$276	
Construction		\$208	\$17	\$224	
Information		\$93	\$65	\$158	
Government		\$95	\$51	\$146	
Agriculture		\$18	\$60	\$78	
Mining		\$18	\$3	\$21	
Total Impact on Value Added	\$3,897	\$3,828	\$2,844	\$10,569	7.1%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-7. The Economic Impact of the Oil and Natural Gas Industry in California, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	159,550			159,550	0.7%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		184,530	267,220	451,750	
<i>Finance, insurance, real estate, rental and leasing</i>		36,880	58,750	95,630	
<i>Wholesale and retail trade</i>		30,370	63,810	94,180	
<i>Transportation and warehousing</i>		63,230	28,980	92,210	
<i>Construction</i>		43,260	3,320	46,580	
<i>Manufacturing</i>		24,160	21,570	45,730	
<i>Information</i>		9,470	12,490	21,960	
<i>Agriculture</i>		2,680	9,660	12,340	
<i>Government</i>		5,750	6,100	11,850	
<i>Utilities</i>		1,930	920	2,850	
<i>Mining</i>		570	80	650	
Total Impact on Employment	159,550	402,830	472,880	1,035,260	4.3%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$23,333			\$23,333	1.1%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$20,183	\$18,257	\$38,440	
<i>Finance, insurance, real estate, rental and leasing</i>		\$4,213	\$5,429	\$9,642	
<i>Transportation and warehousing</i>		\$4,834	\$2,481	\$7,315	
<i>Wholesale and retail trade</i>		\$2,932	\$4,241	\$7,173	
<i>Information</i>		\$3,222	\$3,801	\$7,023	
<i>Manufacturing</i>		\$2,833	\$2,114	\$4,947	
<i>Construction</i>		\$3,609	\$278	\$3,886	
<i>Government</i>		\$728	\$758	\$1,485	
<i>Agriculture</i>		\$174	\$645	\$819	
<i>Utilities</i>		\$505	\$234	\$739	
<i>Mining</i>		\$59	\$8	\$67	
Total Impact on Labor Income	\$23,333	\$43,290	\$38,247	\$104,870	5.0%
Value Added (\$ Millions)					
Industry Direct Impact	\$90,383			\$90,383	2.7%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$23,910	\$22,510	\$46,420	
<i>Finance, insurance, real estate, rental and leasing</i>		\$10,014	\$16,096	\$26,110	
<i>Wholesale and retail trade</i>		\$4,783	\$7,756	\$12,539	
<i>Information</i>		\$5,715	\$6,798	\$12,513	
<i>Manufacturing</i>		\$4,945	\$4,897	\$9,842	
<i>Transportation and warehousing</i>		\$5,916	\$3,898	\$9,814	
<i>Construction</i>		\$4,196	\$375	\$4,572	
<i>Government</i>		\$969	\$1,021	\$1,991	
<i>Utilities</i>		\$1,093	\$514	\$1,607	
<i>Agriculture</i>		\$229	\$884	\$1,114	
<i>Mining</i>		\$197	\$27	\$224	
Total Impact on Value Added	\$90,383	\$61,968	\$64,778	\$217,129	6.4%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-8. The Economic Impact of the Oil and Natural Gas Industry in Colorado, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	54,420			54,420	1.4%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		53,780	83,810	137,590	
<i>Finance, insurance, real estate, rental and leasing</i>		11,980	24,190	36,170	
<i>Wholesale and retail trade</i>		6,500	23,260	29,760	
<i>Transportation and warehousing</i>		7,700	7,590	15,290	
<i>Construction</i>		8,600	1,410	10,010	
<i>Manufacturing</i>		3,800	3,530	7,330	
<i>Information</i>		2,220	3,630	5,850	
<i>Government</i>		1,070	2,440	3,510	
<i>Agriculture</i>		300	2,040	2,340	
<i>Utilities</i>		650	400	1,050	
<i>Mining</i>		340	60	400	
Total Impact on Employment	54,420	96,940	152,380	303,730	7.7%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$15,360			\$15,360	5.4%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$5,527	\$5,068	\$10,596	
<i>Finance, insurance, real estate, rental and leasing</i>		\$928	\$1,463	\$2,391	
<i>Wholesale and retail trade</i>		\$607	\$1,349	\$1,956	
<i>Transportation and warehousing</i>		\$467	\$499	\$967	
<i>Information</i>		\$296	\$464	\$760	
<i>Construction</i>		\$645	\$109	\$753	
<i>Manufacturing</i>		\$339	\$278	\$617	
<i>Government</i>		\$99	\$218	\$317	
<i>Utilities</i>		\$122	\$76	\$198	
<i>Agriculture</i>		\$12	\$87	\$99	
<i>Mining</i>		\$36	\$7	\$43	
Total Impact on Labor Income	\$15,360	\$9,078	\$9,617	\$34,056	12.0%
Value Added (\$ Millions)					
Industry Direct Impact	\$19,848			\$19,848	4.5%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$6,258	\$6,221	\$12,479	
<i>Finance, insurance, real estate, rental and leasing</i>		\$2,086	\$5,003	\$7,089	
<i>Wholesale and retail trade</i>		\$976	\$2,262	\$3,238	
<i>Information</i>		\$583	\$918	\$1,501	
<i>Transportation and warehousing</i>		\$625	\$815	\$1,440	
<i>Manufacturing</i>		\$565	\$531	\$1,095	
<i>Construction</i>		\$731	\$143	\$874	
<i>Utilities</i>		\$350	\$219	\$569	
<i>Government</i>		\$121	\$265	\$386	
<i>Agriculture</i>		\$13	\$102	\$115	
<i>Mining</i>		\$78	\$15	\$93	
Total Impact on Value Added	\$19,848	\$12,385	\$16,494	\$48,726	11.2%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-9. The Economic Impact of the Oil and Natural Gas Industry in Connecticut, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	14,310			14,310	0.6%
Indirect/Induced Impacts on Other Industries					
Services		10,660	21,860	32,520	
Finance, insurance, real estate, rental and leasing		2,780	5,880	8,660	
Wholesale and retail trade		2,340	5,000	7,340	
Transportation and warehousing		3,550	1,890	5,440	
Manufacturing		3,410	1,500	4,910	
Construction		2,990	280	3,270	
Information		520	630	1,150	
Government		290	410	700	
Agriculture		70	230	300	
Utilities		160	100	260	
Mining		40	10	50	
Total Impact on Employment	14,310	26,820	37,800	78,930	3.5%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,234			\$2,234	1.2%
Indirect/Induced Impacts on Other Industries					
Services		\$1,098	\$1,589	\$2,688	
Finance, insurance, real estate, rental and leasing		\$427	\$695	\$1,123	
Wholesale and retail trade		\$255	\$347	\$602	
Manufacturing		\$397	\$148	\$545	
Transportation and warehousing		\$209	\$119	\$329	
Construction		\$256	\$24	\$280	
Information		\$103	\$124	\$228	
Utilities		\$52	\$32	\$84	
Government		\$33	\$46	\$79	
Agriculture		\$2	\$6	\$8	
Mining		***	***	***	
Total Impact on Labor Income	\$2,234	\$2,832	\$3,132	\$8,198	4.4%
Value Added (\$ Millions)					
Industry Direct Impact	\$4,188			\$4,188	1.4%
Indirect/Induced Impacts on Other Industries					
Services		\$1,224	\$1,864	\$3,089	
Finance, insurance, real estate, rental and leasing		\$976	\$1,861	\$2,837	
Wholesale and retail trade		\$388	\$585	\$973	
Manufacturing		\$618	\$272	\$890	
Information		\$280	\$308	\$588	
Transportation and warehousing		\$246	\$167	\$413	
Construction		\$241	\$26	\$266	
Utilities		\$138	\$87	\$226	
Government		\$53	\$73	\$125	
Agriculture		\$2	\$8	\$11	
Mining		\$9	\$1	\$10	
Total Impact on Value Added	\$4,188	\$4,175	\$5,252	\$13,614	4.6%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income. *** Less than \$0.5 million.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-10. The Economic Impact of the Oil and Natural Gas Industry in Delaware, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	5,890			5,890	1.0%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		4,560	6,050	10,610	
<i>Transportation and warehousing</i>		2,100	520	2,620	
<i>Finance, insurance, real estate, rental and leasing</i>		950	1,610	2,560	
<i>Wholesale and retail trade</i>		830	1,500	2,330	
<i>Construction</i>		1,570	90	1,660	
<i>Manufacturing</i>		380	440	820	
<i>Information</i>		290	390	680	
<i>Government</i>		130	110	240	
<i>Utilities</i>		110	40	150	
<i>Agriculture</i>		20	80	100	
<i>Mining</i>		**	**	**	
Total Impact on Employment	5,890	10,960	10,830	27,680	4.5%
Labor Income*** (\$ Millions)					
Industry Direct Impact	\$466			\$466	1.1%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$278	\$350	\$628	
<i>Finance, insurance, real estate, rental and leasing</i>		\$136	\$136	\$272	
<i>Transportation and warehousing</i>		\$130	\$29	\$159	
<i>Wholesale and retail trade</i>		\$65	\$78	\$143	
<i>Construction</i>		\$118	\$7	\$125	
<i>Information</i>		\$42	\$54	\$95	
<i>Manufacturing</i>		\$38	\$32	\$70	
<i>Utilities</i>		\$21	\$7	\$28	
<i>Government</i>		\$12	\$10	\$22	
<i>Agriculture</i>		\$2	\$8	\$10	
<i>Mining</i>		****	****	****	
Total Impact on Labor Income	\$466	\$842	\$711	\$2,019	4.9%
Value Added (\$ Millions)					
Industry Direct Impact	\$981			\$981	1.2%
Indirect/Induced Impacts on Other Industries					
<i>Finance, insurance, real estate, rental and leasing</i>		\$517	\$628	\$1,145	
<i>Services</i>		\$427	\$432	\$859	
<i>Information</i>		\$105	\$135	\$239	
<i>Wholesale and retail trade</i>		\$93	\$112	\$205	
<i>Transportation and warehousing</i>		\$152	\$35	\$187	
<i>Manufacturing</i>		\$98	\$75	\$173	
<i>Construction</i>		\$137	\$9	\$146	
<i>Utilities</i>		\$68	\$24	\$91	
<i>Government</i>		\$15	\$13	\$28	
<i>Agriculture</i>		\$3	\$11	\$14	
<i>Mining</i>		\$1	****	\$1	
Total Impact on Value Added	\$981	\$1,616	\$1,474	\$4,071	5.0%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs. ** Less than 5 jobs.

*** Labor income is defined as wages and salaries and benefits as well as proprietors' income. **** Less than \$0.5 million.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-11. The Economic Impact of the Oil and Natural Gas Industry in the District of Columbia, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	2,450			2,450	0.3%
Indirect/Induced Impacts on Other Industries					
Services		4,540	7,070	11,610	
Finance, insurance, real estate, rental and leasing		1,200	1,290	2,490	
Transportation and warehousing		590	450	1,040	
Wholesale and retail trade		420	530	950	
Information		250	300	550	
Construction		490	30	520	
Government		110	240	350	
Manufacturing		30	60	90	
Utilities		40	10	50	
Agriculture		**	**	**	
Mining		**	**	**	
Total Impact on Employment	2,450	7,650	9,990	20,100	2.3%
Labor Income*** (\$ Millions)					
Industry Direct Impact	\$464			\$464	0.4%
Indirect/Induced Impacts on Other Industries					
Services		\$663	\$764	\$1,427	
Finance, insurance, real estate, rental and leasing		\$264	\$215	\$479	
Transportation and warehousing		\$70	\$62	\$132	
Information		\$61	\$68	\$129	
Wholesale and retail trade		\$67	\$42	\$109	
Government		\$29	\$50	\$78	
Construction		\$43	\$3	\$46	
Utilities		\$10	\$4	\$14	
Manufacturing		\$3	\$5	\$8	
Agriculture		****	****	****	
Mining		****	****	****	
Total Impact on Labor Income	\$464	\$1,209	\$1,213	\$2,886	2.6%
Value Added (\$ Millions)					
Industry Direct Impact	\$1,135			\$1,135	0.7%
Indirect/Induced Impacts on Other Industries					
Services		\$735	\$908	\$1,644	
Finance, insurance, real estate, rental and leasing		\$493	\$478	\$971	
Information		\$129	\$143	\$272	
Wholesale and retail trade		\$83	\$64	\$147	
Transportation and warehousing		\$68	\$77	\$145	
Government		\$43	\$75	\$119	
Construction		\$47	\$4	\$50	
Utilities		\$32	\$12	\$44	
Manufacturing		\$6	\$7	\$13	
Agriculture		****	****	****	
Mining		****	****	****	
Total Impact on Value Added	\$1,135	\$1,636	\$1,769	\$4,540	3.0%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs. ** Less than 5 jobs.

*** Labor income is defined as wages and salaries and benefits as well as proprietors' income. **** Less than \$0.5 million.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-12. The Economic Impact of the Oil and Natural Gas Industry in Florida, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	69,340			69,340	0.5%
Indirect/Induced Impacts on Other Industries					
Services		73,110	112,700	185,810	
Finance, insurance, real estate, rental and leasing		17,250	30,920	48,170	
Wholesale and retail trade		14,640	29,470	44,110	
Transportation and warehousing		20,790	11,320	32,110	
Construction		20,790	1,660	22,450	
Manufacturing		8,370	6,460	14,830	
Information		3,180	3,910	7,090	
Government		1,840	2,090	3,930	
Agriculture		930	2,730	3,660	
Utilities		980	570	1,550	
Mining		290	40	330	
Total Impact on Employment	69,340	162,180	201,870	433,400	3.3%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$3,550			\$3,550	0.5%
Indirect/Induced Impacts on Other Industries					
Services		\$5,501	\$6,361	\$11,862	
Finance, insurance, real estate, rental and leasing		\$1,394	\$1,852	\$3,245	
Wholesale and retail trade		\$1,219	\$1,727	\$2,946	
Transportation and warehousing		\$1,016	\$562	\$1,578	
Construction		\$1,262	\$103	\$1,365	
Manufacturing		\$679	\$447	\$1,126	
Information		\$462	\$520	\$983	
Government		\$178	\$198	\$376	
Utilities		\$208	\$117	\$325	
Agriculture		\$39	\$115	\$154	
Mining		\$20	\$2	\$23	
Total Impact on Labor Income	\$3,550	\$11,978	\$12,005	\$27,533	3.6%
Value Added (\$ Millions)					
Industry Direct Impact	\$14,893			\$14,893	1.2%
Indirect/Induced Impacts on Other Industries					
Services		\$6,420	\$7,761	\$14,181	
Finance, insurance, real estate, rental and leasing		\$3,299	\$6,467	\$9,765	
Wholesale and retail trade		\$1,941	\$3,042	\$4,984	
Manufacturing		\$1,222	\$855	\$2,077	
Transportation and warehousing		\$1,250	\$792	\$2,042	
Construction		\$1,509	\$156	\$1,664	
Information		\$756	\$859	\$1,615	
Utilities		\$729	\$418	\$1,147	
Government		\$234	\$264	\$498	
Agriculture		\$45	\$136	\$181	
Mining		\$78	\$10	\$88	
Total Impact on Value Added	\$14,893	\$17,484	\$20,759	\$53,136	4.2%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-13. The Economic Impact of the Oil and Natural Gas Industry in Georgia, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	45,180			45,180	0.7%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		38,280	54,990	93,270	
<i>Wholesale and retail trade</i>		8,080	14,690	22,770	
<i>Transportation and warehousing</i>		14,080	6,240	20,320	
<i>Finance, insurance, real estate, rental and leasing</i>		7,440	11,640	19,080	
<i>Manufacturing</i>		7,320	6,490	13,810	
<i>Construction</i>		9,520	720	10,240	
<i>Information</i>		1,990	2,410	4,400	
<i>Agriculture</i>		580	1,500	2,080	
<i>Government</i>		720	1,050	1,770	
<i>Utilities</i>		620	350	970	
<i>Mining</i>		240	40	280	
Total Impact on Employment	45,180	88,870	100,120	234,170	3.6%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,589			\$2,589	0.6%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$2,925	\$3,067	\$5,992	
<i>Finance, insurance, real estate, rental and leasing</i>		\$790	\$843	\$1,633	
<i>Wholesale and retail trade</i>		\$735	\$839	\$1,574	
<i>Transportation and warehousing</i>		\$743	\$351	\$1,094	
<i>Manufacturing</i>		\$592	\$468	\$1,060	
<i>Information</i>		\$403	\$469	\$872	
<i>Construction</i>		\$602	\$47	\$649	
<i>Utilities</i>		\$124	\$69	\$193	
<i>Government</i>		\$72	\$97	\$169	
<i>Agriculture</i>		\$24	\$57	\$81	
<i>Mining</i>		\$29	\$4	\$33	
Total Impact on Labor Income	\$2,589	\$7,038	\$6,312	\$15,939	3.9%
Value Added (\$ Millions)					
Industry Direct Impact	\$10,798			\$10,798	1.6%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$3,376	\$3,679	\$7,056	
<i>Finance, insurance, real estate, rental and leasing</i>		\$2,361	\$3,134	\$5,495	
<i>Wholesale and retail trade</i>		\$1,184	\$1,471	\$2,655	
<i>Manufacturing</i>		\$1,090	\$928	\$2,018	
<i>Information</i>		\$740	\$864	\$1,604	
<i>Transportation and warehousing</i>		\$940	\$524	\$1,464	
<i>Construction</i>		\$741	\$74	\$814	
<i>Utilities</i>		\$382	\$216	\$598	
<i>Government</i>		\$90	\$124	\$214	
<i>Agriculture</i>		\$29	\$79	\$108	
<i>Mining</i>		\$79	\$12	\$91	
Total Impact on Value Added	\$10,798	\$11,013	\$11,105	\$32,915	4.8%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-14. The Economic Impact of the Oil and Natural Gas Industry in Hawaii, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	4,120			4,120	0.5%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		4,200	7,210	11,410	
<i>Wholesale and retail trade</i>		790	1,860	2,650	
<i>Finance, insurance, real estate, rental and leasing</i>		940	1,390	2,330	
<i>Construction</i>		1,480	100	1,580	
<i>Transportation and warehousing</i>		970	510	1,480	
<i>Manufacturing</i>		200	370	570	
<i>Agriculture</i>		80	330	410	
<i>Government</i>		160	210	370	
<i>Information</i>		130	170	300	
<i>Utilities</i>		80	50	130	
<i>Mining</i>		10	**	10	
Total Impact on Employment	4,120	9,050	12,210	25,370	3.0%
Labor Income*** (\$ Millions)					
Industry Direct Impact	\$319			\$319	0.6%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$303	\$457	\$760	
<i>Finance, insurance, real estate, rental and leasing</i>		\$74	\$93	\$166	
<i>Wholesale and retail trade</i>		\$57	\$102	\$159	
<i>Construction</i>		\$131	\$9	\$140	
<i>Transportation and warehousing</i>		\$59	\$30	\$89	
<i>Information</i>		\$21	\$24	\$44	
<i>Government</i>		\$19	\$25	\$44	
<i>Manufacturing</i>		\$18	\$20	\$39	
<i>Utilities</i>		\$14	\$9	\$24	
<i>Agriculture</i>		\$2	\$8	\$10	
<i>Mining</i>		\$1	****	\$2	
Total Impact on Labor Income	\$319	\$702	\$777	\$1,798	3.1%
Value Added (\$ Millions)					
Industry Direct Impact	\$1,525			\$1,525	1.7%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$372	\$604	\$976	
<i>Finance, insurance, real estate, rental and leasing</i>		\$229	\$412	\$640	
<i>Wholesale and retail trade</i>		\$90	\$171	\$261	
<i>Construction</i>		\$149	\$12	\$161	
<i>Transportation and warehousing</i>		\$73	\$36	\$108	
<i>Information</i>		\$35	\$42	\$77	
<i>Utilities</i>		\$45	\$30	\$75	
<i>Manufacturing</i>		\$25	\$27	\$52	
<i>Government</i>		\$23	\$29	\$52	
<i>Agriculture</i>		\$2	\$9	\$11	
<i>Mining</i>		\$5	\$1	\$6	
Total Impact on Value Added	\$1,525	\$1,048	\$1,371	\$3,944	4.3%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs. ** Less than 5 jobs.

*** Labor income is defined as wages and salaries and benefits as well as proprietors' income. **** Less than \$0.5 million.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-15. The Economic Impact of the Oil and Natural Gas Industry in Idaho, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	10,400			10,400	0.9%
Indirect/Induced Impacts on Other Industries					
Services		6,250	9,310	15,560	
Wholesale and retail trade		1,260	2,660	3,920	
Finance, insurance, real estate, rental and leasing		1,560	2,120	3,680	
Construction		2,270	180	2,450	
Manufacturing		1,260	1,190	2,450	
Transportation and warehousing		1,410	740	2,150	
Agriculture		290	1,000	1,290	
Government		300	280	580	
Information		240	230	470	
Utilities		100	60	160	
Mining		130	20	150	
Total Impact on Employment	10,400	15,060	17,780	43,240	3.8%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$732			\$732	1.2%
Indirect/Induced Impacts on Other Industries					
Services		\$400	\$467	\$868	
Wholesale and retail trade		\$93	\$151	\$245	
Manufacturing		\$106	\$87	\$193	
Finance, insurance, real estate, rental and leasing		\$91	\$100	\$191	
Construction		\$126	\$10	\$137	
Transportation and warehousing		\$77	\$42	\$119	
Agriculture		\$19	\$82	\$100	
Information		\$27	\$25	\$53	
Government		\$22	\$21	\$44	
Utilities		\$15	\$8	\$23	
Mining		\$10	\$2	\$12	
Total Impact on Labor Income	\$732	\$987	\$997	\$2,716	4.3%
Value Added (\$ Millions)					
Industry Direct Impact	\$1,622			\$1,622	1.7%
Indirect/Induced Impacts on Other Industries					
Services		\$487	\$575	\$1,062	
Finance, insurance, real estate, rental and leasing		\$273	\$421	\$694	
Wholesale and retail trade		\$146	\$240	\$386	
Manufacturing		\$155	\$155	\$310	
Transportation and warehousing		\$102	\$57	\$159	
Construction		\$134	\$13	\$147	
Agriculture		\$18	\$77	\$95	
Information		\$47	\$43	\$91	
Utilities		\$51	\$28	\$78	
Government		\$29	\$28	\$57	
Mining		\$32	\$6	\$38	
Total Impact on Value Added	\$1,622	\$1,474	\$1,644	\$4,739	4.9%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-16. The Economic Impact of the Oil and Natural Gas Industry in Illinois, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	59,480			59,480	0.8%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		59,910	83,080	142,990	
<i>Wholesale and retail trade</i>		11,040	20,940	31,980	
<i>Finance, insurance, real estate, rental and leasing</i>		12,280	19,370	31,650	
<i>Transportation and warehousing</i>		21,600	9,400	31,000	
<i>Manufacturing</i>		12,200	8,360	20,560	
<i>Construction</i>		13,190	920	14,110	
<i>Information</i>		2,260	2,590	4,850	
<i>Government</i>		1,170	1,360	2,530	
<i>Agriculture</i>		440	1,730	2,170	
<i>Utilities</i>		1,100	450	1,550	
<i>Mining</i>		350	40	390	
Total Impact on Employment	59,480	135,550	148,230	343,260	4.5%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$6,428			\$6,428	1.1%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$5,857	\$5,462	\$11,319	
<i>Finance, insurance, real estate, rental and leasing</i>		\$1,453	\$1,937	\$3,390	
<i>Wholesale and retail trade</i>		\$1,096	\$1,380	\$2,476	
<i>Transportation and warehousing</i>		\$1,436	\$580	\$2,017	
<i>Manufacturing</i>		\$1,173	\$823	\$1,996	
<i>Construction</i>		\$965	\$69	\$1,034	
<i>Information</i>		\$390	\$422	\$812	
<i>Utilities</i>		\$300	\$123	\$423	
<i>Government</i>		\$122	\$141	\$263	
<i>Agriculture</i>		\$41	\$162	\$203	
<i>Mining</i>		\$37	\$5	\$42	
Total Impact on Labor Income	\$6,428	\$12,871	\$11,103	\$30,401	5.2%
Value Added (\$ Millions)					
Industry Direct Impact	\$17,672			\$17,672	1.9%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$6,592	\$6,710	\$13,302	
<i>Finance, insurance, real estate, rental and leasing</i>		\$3,724	\$5,600	\$9,324	
<i>Wholesale and retail trade</i>		\$1,810	\$2,525	\$4,336	
<i>Manufacturing</i>		\$1,966	\$1,647	\$3,613	
<i>Transportation and warehousing</i>		\$1,757	\$789	\$2,546	
<i>Information</i>		\$697	\$778	\$1,475	
<i>Construction</i>		\$1,136	\$95	\$1,232	
<i>Utilities</i>		\$810	\$335	\$1,145	
<i>Government</i>		\$149	\$174	\$322	
<i>Agriculture</i>		\$54	\$218	\$272	
<i>Mining</i>		\$63	\$8	\$71	
Total Impact on Value Added	\$17,672	\$18,759	\$18,879	\$55,310	5.8%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-17. The Economic Impact of the Oil and Natural Gas Industry in Indiana, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	37,340			37,340	0.9%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		28,190	38,140	66,330	
<i>Manufacturing</i>		10,950	6,750	17,700	
<i>Transportation and warehousing</i>		12,430	3,920	16,350	
<i>Wholesale and retail trade</i>		5,280	9,870	15,150	
<i>Finance, insurance, real estate, rental and leasing</i>		5,330	6,760	12,090	
<i>Construction</i>		8,180	500	8,680	
<i>Government</i>		1,250	800	2,050	
<i>Agriculture</i>		350	1,450	1,800	
<i>Information</i>		950	840	1,790	
<i>Utilities</i>		620	260	880	
<i>Mining</i>		230	30	260	
Total Impact on Employment	37,340	73,770	69,330	180,440	4.6%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,509			\$2,509	1.0%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$1,947	\$2,147	\$4,094	
<i>Manufacturing</i>		\$949	\$579	\$1,528	
<i>Finance, insurance, real estate, rental and leasing</i>		\$485	\$614	\$1,099	
<i>Transportation and warehousing</i>		\$788	\$235	\$1,023	
<i>Wholesale and retail trade</i>		\$398	\$486	\$884	
<i>Construction</i>		\$551	\$35	\$586	
<i>Information</i>		\$99	\$85	\$184	
<i>Government</i>		\$90	\$60	\$150	
<i>Utilities</i>		\$100	\$42	\$142	
<i>Agriculture</i>		\$25	\$97	\$123	
<i>Mining</i>		\$20	\$3	\$23	
Total Impact on Labor Income	\$2,509	\$5,453	\$4,383	\$12,345	4.8%
Value Added (\$ Millions)					
Industry Direct Impact	\$8,511			\$8,511	2.1%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$2,311	\$2,618	\$4,929	
<i>Manufacturing</i>		\$1,783	\$1,340	\$3,123	
<i>Finance, insurance, real estate, rental and leasing</i>		\$1,168	\$1,805	\$2,973	
<i>Wholesale and retail trade</i>		\$624	\$847	\$1,471	
<i>Transportation and warehousing</i>		\$979	\$305	\$1,284	
<i>Construction</i>		\$645	\$48	\$693	
<i>Utilities</i>		\$355	\$150	\$505	
<i>Information</i>		\$159	\$142	\$301	
<i>Government</i>		\$121	\$82	\$204	
<i>Agriculture</i>		\$33	\$133	\$166	
<i>Mining</i>		\$43	\$6	\$49	
Total Impact on Value Added	\$8,511	\$8,222	\$7,477	\$24,210	5.9%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-18. The Economic Impact of the Oil and Natural Gas Industry in Iowa, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	28,010			28,010	1.4%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		11,250	16,040	27,290	
<i>Manufacturing</i>		4,090	3,140	7,230	
<i>Wholesale and retail trade</i>		2,370	4,810	7,180	
<i>Finance, insurance, real estate, rental and leasing</i>		3,100	3,930	7,030	
<i>Transportation and warehousing</i>		5,380	1,590	6,970	
<i>Construction</i>		3,430	240	3,670	
<i>Agriculture</i>		370	2,210	2,580	
<i>Information</i>		650	490	1,140	
<i>Government</i>		630	380	1,010	
<i>Utilities</i>		300	130	430	
<i>Mining</i>		100	20	120	
Total Impact on Employment	28,010	31,670	32,980	92,660	4.5%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,097			\$1,097	0.9%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$724	\$805	\$1,529	
<i>Manufacturing</i>		\$366	\$249	\$615	
<i>Finance, insurance, real estate, rental and leasing</i>		\$208	\$237	\$445	
<i>Transportation and warehousing</i>		\$324	\$101	\$425	
<i>Wholesale and retail trade</i>		\$167	\$224	\$391	
<i>Construction</i>		\$223	\$16	\$239	
<i>Agriculture</i>		\$21	\$109	\$130	
<i>Information</i>		\$71	\$54	\$125	
<i>Government</i>		\$49	\$31	\$81	
<i>Utilities</i>		\$47	\$20	\$66	
<i>Mining</i>		\$8	\$1	\$9	
Total Impact on Labor Income	\$1,097	\$2,207	\$1,848	\$5,152	4.2%
Value Added (\$ Millions)					
Industry Direct Impact	\$3,019			\$3,019	1.4%
Indirect/Induced Impacts on Other Industries					
<i>Finance, insurance, real estate, rental and leasing</i>		\$800	\$1,058	\$1,858	
<i>Services</i>		\$855	\$981	\$1,836	
<i>Manufacturing</i>		\$715	\$459	\$1,174	
<i>Wholesale and retail trade</i>		\$271	\$368	\$639	
<i>Transportation and warehousing</i>		\$404	\$144	\$548	
<i>Agriculture</i>		\$40	\$243	\$283	
<i>Construction</i>		\$244	\$21	\$266	
<i>Utilities</i>		\$178	\$77	\$255	
<i>Information</i>		\$124	\$95	\$219	
<i>Government</i>		\$68	\$45	\$113	
<i>Mining</i>		\$29	\$5	\$34	
Total Impact on Value Added	\$3,019	\$3,730	\$3,494	\$10,243	4.7%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-19. The Economic Impact of the Oil and Natural Gas Industry in Kansas, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	46,160			46,160	2.4%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		32,560	27,310	59,870	
<i>Finance, insurance, real estate, rental and leasing</i>		7,610	6,410	14,020	
<i>Wholesale and retail trade</i>		4,390	7,620	12,010	
<i>Transportation and warehousing</i>		7,810	2,290	10,100	
<i>Manufacturing</i>		3,330	2,300	5,630	
<i>Construction</i>		5,170	380	5,550	
<i>Government</i>		1,880	1,090	2,970	
<i>Agriculture</i>		290	1,680	1,970	
<i>Information</i>		910	670	1,580	
<i>Utilities</i>		560	150	710	
<i>Mining</i>		160	20	180	
Total Impact on Employment	46,160	64,680	49,920	160,760	8.4%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,586			\$2,586	2.2%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$2,542	\$1,450	\$3,992	
<i>Finance, insurance, real estate, rental and leasing</i>		\$858	\$430	\$1,287	
<i>Wholesale and retail trade</i>		\$361	\$353	\$714	
<i>Transportation and warehousing</i>		\$495	\$131	\$626	
<i>Manufacturing</i>		\$268	\$173	\$441	
<i>Construction</i>		\$324	\$24	\$348	
<i>Government</i>		\$128	\$76	\$204	
<i>Information</i>		\$105	\$79	\$184	
<i>Utilities</i>		\$92	\$25	\$117	
<i>Agriculture</i>		\$17	\$87	\$103	
<i>Mining</i>		\$10	\$1	\$11	
Total Impact on Labor Income	\$2,586	\$5,200	\$2,828	\$10,614	9.0%
Value Added (\$ Millions)					
Industry Direct Impact	\$6,917			\$6,917	3.6%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$3,070	\$1,756	\$4,826	
<i>Finance, insurance, real estate, rental and leasing</i>		\$1,686	\$1,313	\$2,999	
<i>Wholesale and retail trade</i>		\$640	\$640	\$1,281	
<i>Transportation and warehousing</i>		\$667	\$194	\$861	
<i>Manufacturing</i>		\$426	\$339	\$765	
<i>Information</i>		\$235	\$205	\$440	
<i>Construction</i>		\$382	\$31	\$414	
<i>Utilities</i>		\$292	\$81	\$373	
<i>Government</i>		\$157	\$94	\$252	
<i>Agriculture</i>		\$23	\$135	\$158	
<i>Mining</i>		\$40	\$5	\$44	
Total Impact on Value Added	\$6,917	\$7,618	\$4,793	\$19,327	10.1%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-20. The Economic Impact of the Oil and Natural Gas Industry in Kentucky, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	28,280			28,280	1.1%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		18,280	22,210	40,490	
<i>Transportation and warehousing</i>		7,730	2,560	10,290	
<i>Wholesale and retail trade</i>		3,240	6,200	9,440	
<i>Finance, insurance, real estate, rental and leasing</i>		4,090	4,400	8,490	
<i>Manufacturing</i>		4,860	3,380	8,240	
<i>Construction</i>		4,790	310	5,100	
<i>Agriculture</i>		450	1,910	2,360	
<i>Government</i>		1,270	720	1,990	
<i>Information</i>		760	600	1,360	
<i>Utilities</i>		420	170	590	
<i>Mining</i>		270	50	320	
Total Impact on Employment	28,280	46,160	42,500	116,940	4.6%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,376			\$1,376	0.9%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$1,140	\$1,202	\$2,342	
<i>Manufacturing</i>		\$405	\$271	\$675	
<i>Transportation and warehousing</i>		\$502	\$173	\$675	
<i>Finance, insurance, real estate, rental and leasing</i>		\$277	\$266	\$543	
<i>Wholesale and retail trade</i>		\$227	\$293	\$519	
<i>Construction</i>		\$291	\$19	\$311	
<i>Government</i>		\$100	\$59	\$158	
<i>Information</i>		\$72	\$56	\$129	
<i>Utilities</i>		\$63	\$25	\$88	
<i>Agriculture</i>		\$16	\$61	\$77	
<i>Mining</i>		\$23	\$4	\$26	
Total Impact on Labor Income	\$1,376	\$3,115	\$2,428	\$6,920	4.7%
Value Added (\$ Millions)					
Industry Direct Impact	\$6,000			\$6,000	2.5%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$1,319	\$1,423	\$2,741	
<i>Finance, insurance, real estate, rental and leasing</i>		\$815	\$1,002	\$1,817	
<i>Manufacturing</i>		\$690	\$591	\$1,280	
<i>Wholesale and retail trade</i>		\$403	\$521	\$924	
<i>Transportation and warehousing</i>		\$578	\$208	\$786	
<i>Construction</i>		\$311	\$24	\$335	
<i>Utilities</i>		\$223	\$89	\$312	
<i>Information</i>		\$132	\$108	\$240	
<i>Government</i>		\$124	\$75	\$199	
<i>Agriculture</i>		\$18	\$77	\$96	
<i>Mining</i>		\$40	\$7	\$46	
Total Impact on Value Added	\$6,000	\$4,652	\$4,124	\$14,777	6.2%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-21. The Economic Impact of the Oil and Natural Gas Industry in Louisiana, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	91,720			91,720	3.5%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		62,150	72,270	134,420	
<i>Finance, insurance, real estate, rental and leasing</i>		15,150	15,090	30,240	
<i>Wholesale and retail trade</i>		9,090	19,020	28,110	
<i>Transportation and warehousing</i>		18,980	4,270	23,250	
<i>Construction</i>		16,460	1,050	17,510	
<i>Manufacturing</i>		5,800	2,280	8,080	
<i>Government</i>		3,600	2,270	5,870	
<i>Information</i>		2,020	1,610	3,630	
<i>Utilities</i>		1,440	390	1,830	
<i>Agriculture</i>		450	1,340	1,790	
<i>Mining</i>		230	20	250	
Total Impact on Employment	91,720	135,380	119,610	346,710	13.1%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$10,748			\$10,748	7.0%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$3,751	\$3,553	\$7,303	
<i>Finance, insurance, real estate, rental and leasing</i>		\$1,006	\$694	\$1,700	
<i>Wholesale and retail trade</i>		\$702	\$848	\$1,550	
<i>Transportation and warehousing</i>		\$1,217	\$229	\$1,446	
<i>Construction</i>		\$1,021	\$65	\$1,086	
<i>Manufacturing</i>		\$635	\$178	\$813	
<i>Government</i>		\$280	\$177	\$456	
<i>Information</i>		\$169	\$133	\$302	
<i>Utilities</i>		\$215	\$58	\$273	
<i>Agriculture</i>		\$17	\$47	\$64	
<i>Mining</i>		\$20	\$2	\$22	
Total Impact on Labor Income	\$10,748	\$9,033	\$5,982	\$25,763	16.7%
Value Added (\$ Millions)					
Industry Direct Impact	\$29,165			\$29,165	11.3%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$4,241	\$4,129	\$8,370	
<i>Finance, insurance, real estate, rental and leasing</i>		\$2,622	\$3,065	\$5,687	
<i>Wholesale and retail trade</i>		\$1,285	\$1,494	\$2,779	
<i>Manufacturing</i>		\$2,236	\$429	\$2,666	
<i>Transportation and warehousing</i>		\$1,473	\$279	\$1,753	
<i>Construction</i>		\$1,272	\$87	\$1,359	
<i>Utilities</i>		\$944	\$254	\$1,198	
<i>Information</i>		\$340	\$266	\$606	
<i>Government</i>		\$329	\$209	\$538	
<i>Agriculture</i>		\$19	\$61	\$80	
<i>Mining</i>		\$54	\$5	\$59	
Total Impact on Value Added	\$29,165	\$14,816	\$10,279	\$54,260	21.0%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-22. The Economic Impact of the Oil and Natural Gas Industry in Maine, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	11,340			11,340	1.3%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		5,000	8,270	13,270	
<i>Wholesale and retail trade</i>		950	2,070	3,020	
<i>Finance, insurance, real estate, rental and leasing</i>		1,110	1,480	2,590	
<i>Transportation and warehousing</i>		1,520	510	2,030	
<i>Manufacturing</i>		1,040	840	1,880	
<i>Construction</i>		1,590	130	1,720	
<i>Agriculture</i>		180	440	620	
<i>Information</i>		260	200	460	
<i>Government</i>		240	200	440	
<i>Utilities</i>		80	40	120	
<i>Mining</i>		40	**	40	
Total Impact on Employment	11,340	12,010	14,180	37,530	4.5%
Labor Income*** (\$ Millions)					
Industry Direct Impact	\$604			\$604	1.2%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$336	\$479	\$815	
<i>Wholesale and retail trade</i>		\$71	\$104	\$175	
<i>Finance, insurance, real estate, rental and leasing</i>		\$73	\$86	\$159	
<i>Manufacturing</i>		\$79	\$61	\$140	
<i>Transportation and warehousing</i>		\$88	\$29	\$116	
<i>Construction</i>		\$89	\$8	\$97	
<i>Information</i>		\$28	\$23	\$51	
<i>Government</i>		\$20	\$17	\$37	
<i>Agriculture</i>		\$6	\$17	\$23	
<i>Utilities</i>		\$11	\$5	\$16	
<i>Mining</i>		\$2	****	\$2	
Total Impact on Labor Income	\$604	\$803	\$828	\$2,236	4.5%
Value Added (\$ Millions)					
Industry Direct Impact	\$1,739			\$1,739	2.2%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$408	\$593	\$1,001	
<i>Finance, insurance, real estate, rental and leasing</i>		\$275	\$424	\$698	
<i>Wholesale and retail trade</i>		\$106	\$180	\$286	
<i>Manufacturing</i>		\$124	\$114	\$239	
<i>Transportation and warehousing</i>		\$109	\$40	\$150	
<i>Construction</i>		\$86	\$8	\$94	
<i>Information</i>		\$47	\$37	\$84	
<i>Utilities</i>		\$50	\$23	\$73	
<i>Government</i>		\$25	\$22	\$47	
<i>Agriculture</i>		\$6	\$19	\$25	
<i>Mining</i>		\$7	\$1	\$8	
Total Impact on Value Added	\$1,739	\$1,244	\$1,462	\$4,445	5.7%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs. ** Less than 5 jobs.

*** Labor income is defined as wages and salaries and benefits as well as proprietors' income. **** Less than \$0.5 million.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-23. The Economic Impact of the Oil and Natural Gas Industry in Maryland, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	18,030			18,030	0.5%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		18,300	28,570	46,870	
<i>Wholesale and retail trade</i>		3,490	6,310	9,800	
<i>Transportation and warehousing</i>		6,030	3,130	9,160	
<i>Finance, insurance, real estate, rental and leasing</i>		3,240	5,720	8,960	
<i>Construction</i>		6,230	410	6,640	
<i>Manufacturing</i>		1,880	1,750	3,630	
<i>Information</i>		700	850	1,550	
<i>Government</i>		300	580	880	
<i>Agriculture</i>		110	440	550	
<i>Utilities</i>		320	170	490	
<i>Mining</i>		60	10	70	
Total Impact on Employment	18,030	40,660	47,940	106,630	2.9%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,153			\$1,153	0.4%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$1,712	\$1,857	\$3,569	
<i>Finance, insurance, real estate, rental and leasing</i>		\$317	\$465	\$781	
<i>Wholesale and retail trade</i>		\$300	\$362	\$662	
<i>Transportation and warehousing</i>		\$328	\$182	\$510	
<i>Construction</i>		\$449	\$31	\$480	
<i>Manufacturing</i>		\$179	\$147	\$326	
<i>Information</i>		\$136	\$146	\$282	
<i>Utilities</i>		\$99	\$52	\$151	
<i>Government</i>		\$51	\$83	\$134	
<i>Agriculture</i>		\$5	\$15	\$20	
<i>Mining</i>		\$4	\$1	\$5	
Total Impact on Labor Income	\$1,153	\$3,580	\$3,341	\$8,074	2.9%
Value Added (\$ Millions)					
Industry Direct Impact	\$4,950			\$4,950	1.1%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$1,979	\$2,240	\$4,220	
<i>Finance, insurance, real estate, rental and leasing</i>		\$884	\$1,674	\$2,558	
<i>Wholesale and retail trade</i>		\$484	\$629	\$1,113	
<i>Transportation and warehousing</i>		\$404	\$260	\$663	
<i>Manufacturing</i>		\$327	\$326	\$653	
<i>Construction</i>		\$558	\$49	\$607	
<i>Information</i>		\$248	\$271	\$519	
<i>Utilities</i>		\$242	\$130	\$372	
<i>Government</i>		\$87	\$143	\$230	
<i>Agriculture</i>		\$6	\$25	\$31	
<i>Mining</i>		\$10	\$2	\$12	
Total Impact on Value Added	\$4,950	\$5,229	\$5,749	\$15,927	3.6%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Table B-24. The Economic Impact of the Oil and Natural Gas Industry in Massachusetts, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	24,880			24,880	0.5%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		24,650	45,060	69,710	
<i>Finance, insurance, real estate, rental and leasing</i>		5,540	9,500	15,040	
<i>Wholesale and retail trade</i>		4,640	9,400	14,040	
<i>Transportation and warehousing</i>		5,390	3,950	9,340	
<i>Manufacturing</i>		4,250	3,150	7,400	
<i>Construction</i>		6,680	520	7,200	
<i>Information</i>		1,020	1,230	2,250	
<i>Government</i>		180	520	700	
<i>Agriculture</i>		120	410	530	
<i>Utilities</i>		320	200	520	
<i>Mining</i>		60	10	70	
Total Impact on Employment	24,880	52,850	73,950	151,680	3.2%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,707			\$2,707	0.6%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$3,063	\$3,474	\$6,537	
<i>Finance, insurance, real estate, rental and leasing</i>		\$841	\$1,198	\$2,039	
<i>Wholesale and retail trade</i>		\$527	\$683	\$1,211	
<i>Manufacturing</i>		\$481	\$317	\$798	
<i>Transportation and warehousing</i>		\$380	\$328	\$708	
<i>Construction</i>		\$602	\$49	\$650	
<i>Information</i>		\$202	\$226	\$428	
<i>Utilities</i>		\$102	\$62	\$164	
<i>Government</i>		\$28	\$62	\$90	
<i>Agriculture</i>		\$5	\$18	\$23	
<i>Mining</i>		\$5	\$1	\$6	
Total Impact on Labor Income	\$2,707	\$6,236	\$6,417	\$15,361	3.6%
Value Added (\$ Millions)					
Industry Direct Impact	\$6,663			\$6,663	1.0%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$3,617	\$4,170	\$7,787	
<i>Finance, insurance, real estate, rental and leasing</i>		\$1,864	\$3,101	\$4,964	
<i>Wholesale and retail trade</i>		\$722	\$1,057	\$1,779	
<i>Manufacturing</i>		\$764	\$640	\$1,404	
<i>Transportation and warehousing</i>		\$555	\$586	\$1,141	
<i>Information</i>		\$343	\$387	\$730	
<i>Construction</i>		\$592	\$55	\$647	
<i>Utilities</i>		\$254	\$157	\$410	
<i>Government</i>		\$53	\$115	\$168	
<i>Agriculture</i>		\$2	\$15	\$17	
<i>Mining</i>		\$9	\$1	\$10	
Total Impact on Value Added	\$6,663	\$8,774	\$10,284	\$25,721	4.0%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-25. The Economic Impact of the Oil and Natural Gas Industry in Michigan, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	45,640			45,640	0.8%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		38,440	53,200	91,640	
<i>Wholesale and retail trade</i>		6,950	13,390	20,340	
<i>Manufacturing</i>		12,510	7,670	20,180	
<i>Finance, insurance, real estate, rental and leasing</i>		7,590	11,320	18,910	
<i>Transportation and warehousing</i>		9,710	4,170	13,880	
<i>Construction</i>		8,380	720	9,100	
<i>Information</i>		1,760	1,820	3,580	
<i>Agriculture</i>		520	1,660	2,180	
<i>Government</i>		820	1,000	1,820	
<i>Utilities</i>		710	390	1,100	
<i>Mining</i>		180	30	210	
Total Impact on Employment	45,640	87,590	95,350	228,570	4.1%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$3,395			\$3,395	0.9%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$3,100	\$3,138	\$6,238	
<i>Manufacturing</i>		\$1,127	\$660	\$1,787	
<i>Wholesale and retail trade</i>		\$601	\$739	\$1,340	
<i>Finance, insurance, real estate, rental and leasing</i>		\$554	\$689	\$1,244	
<i>Transportation and warehousing</i>		\$570	\$248	\$818	
<i>Construction</i>		\$559	\$49	\$608	
<i>Information</i>		\$208	\$210	\$417	
<i>Utilities</i>		\$163	\$87	\$250	
<i>Government</i>		\$75	\$90	\$165	
<i>Agriculture</i>		\$21	\$68	\$89	
<i>Mining</i>		\$16	\$3	\$19	
Total Impact on Labor Income	\$3,395	\$6,995	\$5,980	\$16,370	4.5%
Value Added (\$ Millions)					
Industry Direct Impact	\$9,619			\$9,619	1.7%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$3,572	\$3,696	\$7,268	
<i>Finance, insurance, real estate, rental and leasing</i>		\$1,623	\$2,692	\$4,315	
<i>Manufacturing</i>		\$1,861	\$1,211	\$3,072	
<i>Wholesale and retail trade</i>		\$940	\$1,244	\$2,184	
<i>Transportation and warehousing</i>		\$681	\$338	\$1,019	
<i>Information</i>		\$347	\$347	\$694	
<i>Construction</i>		\$582	\$59	\$642	
<i>Utilities</i>		\$409	\$221	\$630	
<i>Government</i>		\$102	\$123	\$225	
<i>Agriculture</i>		\$29	\$101	\$130	
<i>Mining</i>		\$65	\$12	\$77	
Total Impact on Value Added	\$9,619	\$10,211	\$10,043	\$29,873	5.2%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-26. The Economic Impact of the Oil and Natural Gas Industry in Minnesota, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	38,870			38,870	1.1%
Indirect/Induced Impacts on Other Industries					
Services		24,910	39,170	64,080	
Wholesale and retail trade		5,030	9,780	14,810	
Finance, insurance, real estate, rental and leasing		5,790	8,780	14,570	
Transportation and warehousing		8,090	3,270	11,360	
Manufacturing		6,600	4,320	10,920	
Construction		7,880	480	8,360	
Agriculture		410	1,870	2,280	
Government		1,110	810	1,920	
Information		930	910	1,840	
Utilities		710	270	980	
Mining		290	50	340	
Total Impact on Employment	38,870	61,770	69,710	170,350	4.6%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,578			\$2,578	1.0%
Indirect/Induced Impacts on Other Industries					
Services		\$2,269	\$2,519	\$4,789	
Finance, insurance, real estate, rental and leasing		\$539	\$714	\$1,253	
Wholesale and retail trade		\$491	\$606	\$1,097	
Manufacturing		\$612	\$378	\$991	
Transportation and warehousing		\$557	\$215	\$772	
Construction		\$630	\$40	\$669	
Information		\$142	\$132	\$275	
Utilities		\$130	\$50	\$180	
Government		\$94	\$71	\$164	
Agriculture		\$27	\$121	\$148	
Mining		\$37	\$6	\$43	
Total Impact on Labor Income	\$2,578	\$5,528	\$4,853	\$12,959	5.0%
Value Added (\$ Millions)					
Industry Direct Impact	\$8,691			\$8,691	2.1%
Indirect/Induced Impacts on Other Industries					
Services		\$2,670	\$2,990	\$5,661	
Finance, insurance, real estate, rental and leasing		\$1,447	\$2,296	\$3,743	
Wholesale and retail trade		\$743	\$988	\$1,732	
Manufacturing		\$916	\$592	\$1,508	
Transportation and warehousing		\$708	\$323	\$1,031	
Construction		\$719	\$53	\$772	
Utilities		\$352	\$136	\$489	
Information		\$245	\$235	\$480	
Government		\$122	\$94	\$217	
Agriculture		\$32	\$163	\$195	
Mining		\$89	\$15	\$104	
Total Impact on Value Added	\$8,691	\$8,045	\$7,886	\$24,622	6.0%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-27. The Economic Impact of the Oil and Natural Gas Industry in Mississippi, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	30,710			30,710	1.9%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		18,620	18,310	36,930	
<i>Transportation and warehousing</i>		8,090	1,560	9,650	
<i>Finance, insurance, real estate, rental and leasing</i>		4,440	3,420	7,860	
<i>Wholesale and retail trade</i>		2,680	5,160	7,840	
<i>Construction</i>		5,320	280	5,600	
<i>Manufacturing</i>		3,330	1,990	5,320	
<i>Government</i>		1,230	610	1,840	
<i>Agriculture</i>		370	1,030	1,400	
<i>Information</i>		630	390	1,020	
<i>Utilities</i>		660	200	860	
<i>Mining</i>		100	10	110	
Total Impact on Employment	30,710	45,460	32,950	109,120	6.8%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,996			\$1,996	2.5%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$874	\$784	\$1,658	
<i>Transportation and warehousing</i>		\$458	\$85	\$543	
<i>Manufacturing</i>		\$252	\$118	\$370	
<i>Wholesale and retail trade</i>		\$155	\$202	\$358	
<i>Finance, insurance, real estate, rental and leasing</i>		\$219	\$130	\$349	
<i>Construction</i>		\$262	\$14	\$276	
<i>Government</i>		\$84	\$44	\$128	
<i>Utilities</i>		\$83	\$26	\$109	
<i>Information</i>		\$44	\$27	\$71	
<i>Agriculture</i>		\$17	\$41	\$58	
<i>Mining</i>		\$6	\$1	\$6	
Total Impact on Labor Income	\$1,996	\$2,453	\$1,473	\$5,922	7.5%
Value Added (\$ Millions)					
Industry Direct Impact	\$7,920			\$7,920	6.2%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$1,048	\$949	\$1,998	
<i>Finance, insurance, real estate, rental and leasing</i>		\$769	\$719	\$1,488	
<i>Transportation and warehousing</i>		\$580	\$110	\$690	
<i>Wholesale and retail trade</i>		\$288	\$363	\$651	
<i>Manufacturing</i>		\$430	\$195	\$625	
<i>Utilities</i>		\$282	\$89	\$371	
<i>Construction</i>		\$268	\$16	\$283	
<i>Information</i>		\$93	\$63	\$156	
<i>Government</i>		\$101	\$54	\$155	
<i>Agriculture</i>		\$20	\$59	\$79	
<i>Mining</i>		\$12	\$1	\$13	
Total Impact on Value Added	\$7,920	\$3,890	\$2,618	\$14,428	11.3%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-28. The Economic Impact of the Oil and Natural Gas Industry in Missouri, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	41,510			41,510	1.1%
Indirect/Induced Impacts on Other Industries					
Services		25,800	37,060	62,860	
Finance, insurance, real estate, rental and leasing		6,750	8,330	15,080	
Wholesale and retail trade		5,140	9,510	14,650	
Transportation and warehousing		8,330	3,110	11,440	
Manufacturing		5,390	3,940	9,330	
Construction		5,880	490	6,370	
Agriculture		500	2,240	2,740	
Information		1,270	1,210	2,480	
Government		1,120	910	2,030	
Utilities		520	240	760	
Mining		220	30	250	
Total Impact on Employment	41,510	60,920	67,090	169,520	4.5%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,326			\$2,326	1.0%
Indirect/Induced Impacts on Other Industries					
Services		\$1,970	\$2,102	\$4,072	
Finance, insurance, real estate, rental and leasing		\$525	\$537	\$1,062	
Wholesale and retail trade		\$416	\$482	\$899	
Manufacturing		\$423	\$300	\$724	
Transportation and warehousing		\$461	\$175	\$636	
Construction		\$384	\$33	\$417	
Information		\$149	\$133	\$283	
Government		\$88	\$73	\$161	
Utilities		\$82	\$38	\$120	
Agriculture		\$22	\$79	\$101	
Mining		\$23	\$3	\$26	
Total Impact on Labor Income	\$2,326	\$4,543	\$3,957	\$10,826	4.7%
Value Added (\$ Millions)					
Industry Direct Impact	\$6,109			\$6,109	1.7%
Indirect/Induced Impacts on Other Industries					
Services		\$2,338	\$2,548	\$4,885	
Finance, insurance, real estate, rental and leasing		\$1,529	\$1,847	\$3,377	
Wholesale and retail trade		\$654	\$838	\$1,492	
Manufacturing		\$729	\$609	\$1,338	
Transportation and warehousing		\$593	\$247	\$840	
Information		\$262	\$249	\$511	
Construction		\$415	\$42	\$458	
Utilities		\$231	\$108	\$339	
Government		\$109	\$92	\$202	
Agriculture		\$23	\$93	\$116	
Mining		\$64	\$9	\$74	
Total Impact on Value Added	\$6,109	\$6,947	\$6,684	\$19,740	5.5%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-29. The Economic Impact of the Oil and Natural Gas Industry in Montana, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	13,740			13,740	1.9%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		9,820	11,570	21,390	
<i>Finance, insurance, real estate, rental and leasing</i>		2,420	2,690	5,110	
<i>Wholesale and retail trade</i>		1,710	3,240	4,950	
<i>Transportation and warehousing</i>		3,170	680	3,850	
<i>Construction</i>		3,390	200	3,590	
<i>Agriculture</i>		210	850	1,060	
<i>Manufacturing</i>		560	440	1,000	
<i>Government</i>		640	340	980	
<i>Information</i>		320	250	570	
<i>Utilities</i>		290	80	370	
<i>Mining</i>		280	40	320	
Total Impact on Employment	13,740	22,800	20,370	56,910	8.0%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,226			\$1,226	3.2%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$590	\$578	\$1,168	
<i>Finance, insurance, real estate, rental and leasing</i>		\$144	\$122	\$266	
<i>Wholesale and retail trade</i>		\$114	\$151	\$265	
<i>Transportation and warehousing</i>		\$219	\$44	\$263	
<i>Construction</i>		\$200	\$12	\$212	
<i>Government</i>		\$47	\$26	\$73	
<i>Manufacturing</i>		\$37	\$23	\$60	
<i>Agriculture</i>		\$10	\$45	\$55	
<i>Information</i>		\$31	\$24	\$54	
<i>Utilities</i>		\$40	\$11	\$51	
<i>Mining</i>		\$32	\$5	\$37	
Total Impact on Labor Income	\$1,226	\$1,464	\$1,040	\$3,730	9.8%
Value Added (\$ Millions)					
Industry Direct Impact	\$3,674			\$3,674	6.3%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$669	\$700	\$1,369	
<i>Finance, insurance, real estate, rental and leasing</i>		\$402	\$497	\$899	
<i>Wholesale and retail trade</i>		\$179	\$214	\$393	
<i>Transportation and warehousing</i>		\$303	\$64	\$367	
<i>Construction</i>		\$218	\$14	\$233	
<i>Utilities</i>		\$117	\$31	\$147	
<i>Information</i>		\$58	\$45	\$103	
<i>Manufacturing</i>		\$59	\$35	\$94	
<i>Government</i>		\$58	\$32	\$90	
<i>Mining</i>		\$50	\$8	\$58	
<i>Agriculture</i>		\$8	\$42	\$50	
Total Impact on Value Added	\$3,674	\$2,121	\$1,681	\$7,476	12.7%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Table B-30. The Economic Impact of the Oil and Natural Gas Industry in Nebraska, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	14,230			14,230	1.1%
Indirect/Induced Impacts on Other Industries					
Services		8,370	15,220	23,590	
Wholesale and retail trade		1,380	4,320	5,700	
Finance, insurance, real estate, rental and leasing		2,040	3,520	5,560	
Transportation and warehousing		2,680	1,450	4,130	
Manufacturing		1,560	1,750	3,310	
Construction		2,210	210	2,420	
Agriculture		240	1,370	1,610	
Information		440	490	930	
Government		390	360	750	
Utilities		240	140	380	
Mining		40	10	50	
Total Impact on Employment	14,230	19,570	28,850	62,650	4.7%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,967			\$1,967	2.4%
Indirect/Induced Impacts on Other Industries					
Services		\$601	\$842	\$1,443	
Finance, insurance, real estate, rental and leasing		\$145	\$195	\$341	
Wholesale and retail trade		\$108	\$200	\$308	
Transportation and warehousing		\$190	\$105	\$295	
Manufacturing		\$125	\$135	\$261	
Agriculture		\$24	\$126	\$150	
Construction		\$129	\$13	\$142	
Information		\$52	\$57	\$108	
Government		\$31	\$29	\$61	
Utilities		\$38	\$22	\$60	
Mining		\$3	\$1	\$3	
Total Impact on Labor Income	\$1,967	\$1,446	\$1,724	\$5,138	6.2%
Value Added (\$ Millions)					
Industry Direct Impact	\$4,480			\$4,480	3.1%
Indirect/Induced Impacts on Other Industries					
Services		\$705	\$994	\$1,699	
Finance, insurance, real estate, rental and leasing		\$468	\$820	\$1,289	
Wholesale and retail trade		\$177	\$355	\$531	
Transportation and warehousing		\$327	\$187	\$514	
Manufacturing		\$220	\$270	\$490	
Agriculture		\$36	\$205	\$241	
Information		\$93	\$103	\$196	
Construction		\$152	\$19	\$170	
Utilities		\$100	\$57	\$157	
Government		\$39	\$36	\$75	
Mining		\$7	\$2	\$9	
Total Impact on Value Added	\$4,480	\$2,323	\$3,047	\$9,851	6.7%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-31. The Economic Impact of the Oil and Natural Gas Industry in Nevada, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	14,400			14,400	0.8%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		11,390	17,530	28,920	
<i>Transportation and warehousing</i>		4,660	2,060	6,720	
<i>Finance, insurance, real estate, rental and leasing</i>		2,560	3,970	6,530	
<i>Wholesale and retail trade</i>		1,980	4,140	6,120	
<i>Construction</i>		3,270	230	3,500	
<i>Manufacturing</i>		1,180	970	2,150	
<i>Information</i>		510	580	1,090	
<i>Government</i>		340	330	670	
<i>Mining</i>		540	100	640	
<i>Utilities</i>		130	60	190	
<i>Agriculture</i>		40	140	180	
Total Impact on Employment	14,400	26,590	30,120	71,120	3.8%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,121			\$1,121	1.0%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$850	\$1,059	\$1,909	
<i>Wholesale and retail trade</i>		\$165	\$242	\$408	
<i>Transportation and warehousing</i>		\$242	\$102	\$344	
<i>Finance, insurance, real estate, rental and leasing</i>		\$160	\$177	\$337	
<i>Construction</i>		\$242	\$18	\$259	
<i>Information</i>		\$100	\$102	\$202	
<i>Manufacturing</i>		\$101	\$75	\$176	
<i>Mining</i>		\$63	\$12	\$75	
<i>Government</i>		\$36	\$35	\$71	
<i>Utilities</i>		\$25	\$12	\$36	
<i>Agriculture</i>		\$2	\$7	\$9	
Total Impact on Labor Income	\$1,121	\$1,985	\$1,841	\$4,947	4.2%
Value Added (\$ Millions)					
Industry Direct Impact	\$3,662			\$3,662	1.9%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$1,070	\$1,421	\$2,491	
<i>Finance, insurance, real estate, rental and leasing</i>		\$556	\$842	\$1,398	
<i>Wholesale and retail trade</i>		\$247	\$418	\$665	
<i>Transportation and warehousing</i>		\$285	\$133	\$418	
<i>Construction</i>		\$337	\$32	\$370	
<i>Information</i>		\$169	\$178	\$347	
<i>Manufacturing</i>		\$159	\$127	\$286	
<i>Mining</i>		\$173	\$32	\$205	
<i>Utilities</i>		\$83	\$40	\$122	
<i>Government</i>		\$45	\$44	\$88	
<i>Agriculture</i>		\$2	\$9	\$12	
Total Impact on Value Added	\$3,662	\$3,126	\$3,276	\$10,063	5.2%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-32. The Economic Impact of the Oil and Natural Gas Industry in New Hampshire, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	8,380			8,380	0.9%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		4,910	7,750	12,660	
<i>Wholesale and retail trade</i>		1,300	2,310	3,610	
<i>Finance, insurance, real estate, rental and leasing</i>		1,020	1,690	2,710	
<i>Manufacturing</i>		1,500	740	2,240	
<i>Construction</i>		1,430	120	1,550	
<i>Transportation and warehousing</i>		1,030	520	1,550	
<i>Information</i>		190	200	390	
<i>Government</i>		110	130	240	
<i>Agriculture</i>		70	140	210	
<i>Utilities</i>		70	40	110	
<i>Mining</i>		30	**	30	
Total Impact on Employment	8,380	11,660	13,640	33,680	3.8%
Labor Income*** (\$ Millions)					
Industry Direct Impact	\$559			\$559	0.8%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$563	\$580	\$1,144	
<i>Wholesale and retail trade</i>		\$154	\$158	\$312	
<i>Finance, insurance, real estate, rental and leasing</i>		\$103	\$151	\$254	
<i>Manufacturing</i>		\$141	\$60	\$201	
<i>Construction</i>		\$119	\$10	\$129	
<i>Transportation and warehousing</i>		\$47	\$36	\$83	
<i>Information</i>		\$32	\$31	\$63	
<i>Utilities</i>		\$15	\$8	\$22	
<i>Government</i>		\$10	\$12	\$22	
<i>Agriculture</i>		\$2	\$3	\$5	
<i>Mining</i>		\$2	****	\$2	
Total Impact on Labor Income	\$559	\$1,188	\$1,048	\$2,795	4.1%
Value Added (\$ Millions)					
Industry Direct Impact	\$1,242			\$1,242	1.2%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$632	\$699	\$1,331	
<i>Finance, insurance, real estate, rental and leasing</i>		\$272	\$496	\$769	
<i>Wholesale and retail trade</i>		\$192	\$225	\$417	
<i>Manufacturing</i>		\$197	\$91	\$287	
<i>Transportation and warehousing</i>		\$90	\$67	\$157	
<i>Construction</i>		\$110	\$10	\$121	
<i>Information</i>		\$47	\$47	\$94	
<i>Utilities</i>		\$48	\$25	\$73	
<i>Government</i>		\$18	\$21	\$40	
<i>Mining</i>		\$6	\$1	\$7	
<i>Agriculture</i>		\$2	\$4	\$6	
Total Impact on Value Added	\$1,242	\$1,615	\$1,686	\$4,544	4.6%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs. ** Less than 5 jobs.

*** Labor income is defined as wages and salaries and benefits as well as proprietors' income. **** Less than \$0.5 million.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-33. The Economic Impact of the Oil and Natural Gas Industry in New Jersey, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	36,910			36,910	0.7%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		34,300	53,590	87,890	
<i>Finance, insurance, real estate, rental and leasing</i>		8,850	15,060	23,910	
<i>Wholesale and retail trade</i>		7,000	14,210	21,210	
<i>Transportation and warehousing</i>		13,330	6,420	19,750	
<i>Construction</i>		8,240	680	8,920	
<i>Manufacturing</i>		4,370	4,290	8,660	
<i>Information</i>		1,400	1,750	3,150	
<i>Government</i>		920	1,010	1,930	
<i>Utilities</i>		430	210	640	
<i>Agriculture</i>		140	450	590	
<i>Mining</i>		110	10	120	
Total Impact on Employment	36,910	79,080	97,690	213,680	3.9%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$4,567			\$4,567	1.0%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$3,611	\$2,983	\$6,594	
<i>Finance, insurance, real estate, rental and leasing</i>		\$957	\$938	\$1,895	
<i>Wholesale and retail trade</i>		\$750	\$817	\$1,568	
<i>Transportation and warehousing</i>		\$914	\$355	\$1,269	
<i>Manufacturing</i>		\$490	\$527	\$1,018	
<i>Construction</i>		\$721	\$41	\$762	
<i>Information</i>		\$276	\$255	\$530	
<i>Government</i>		\$105	\$79	\$184	
<i>Utilities</i>		\$103	\$40	\$143	
<i>Mining</i>		\$30	\$3	\$33	
<i>Agriculture</i>		\$7	\$18	\$25	
Total Impact on Labor Income	\$4,567	\$7,964	\$6,055	\$18,587	4.2%
Value Added (\$ Millions)					
Industry Direct Impact	\$17,456			\$17,456	2.6%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$4,274	\$3,552	\$7,826	
<i>Finance, insurance, real estate, rental and leasing</i>		\$1,933	\$2,592	\$4,526	
<i>Wholesale and retail trade</i>		\$1,167	\$1,418	\$2,585	
<i>Manufacturing</i>		\$740	\$941	\$1,681	
<i>Transportation and warehousing</i>		\$1,022	\$446	\$1,468	
<i>Information</i>		\$459	\$425	\$885	
<i>Construction</i>		\$728	\$47	\$775	
<i>Utilities</i>		\$326	\$129	\$455	
<i>Government</i>		\$138	\$106	\$245	
<i>Mining</i>		\$38	\$3	\$41	
<i>Agriculture</i>		\$9	\$23	\$31	
Total Impact on Value Added	\$17,456	\$10,833	\$9,684	\$37,974	5.6%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-34. The Economic Impact of the Oil and Natural Gas Industry in New Mexico, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	35,610			35,610	3.3%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		12,810	17,080	29,890	
<i>Finance, insurance, real estate, rental and leasing</i>		4,540	3,040	7,580	
<i>Wholesale and retail trade</i>		2,290	4,520	6,810	
<i>Transportation and warehousing</i>		3,160	940	4,100	
<i>Construction</i>		3,240	260	3,500	
<i>Manufacturing</i>		810	620	1,430	
<i>Government</i>		620	520	1,140	
<i>Agriculture</i>		170	810	980	
<i>Information</i>		460	350	810	
<i>Utilities</i>		330	110	440	
<i>Mining</i>		180	30	210	
Total Impact on Employment	35,610	28,610	28,290	92,510	8.5%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,819			\$2,819	4.5%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$815	\$840	\$1,655	
<i>Finance, insurance, real estate, rental and leasing</i>		\$276	\$148	\$423	
<i>Wholesale and retail trade</i>		\$137	\$190	\$327	
<i>Transportation and warehousing</i>		\$188	\$53	\$241	
<i>Construction</i>		\$182	\$15	\$197	
<i>Government</i>		\$56	\$47	\$103	
<i>Manufacturing</i>		\$49	\$34	\$83	
<i>Information</i>		\$41	\$31	\$72	
<i>Utilities</i>		\$42	\$15	\$57	
<i>Agriculture</i>		\$6	\$35	\$41	
<i>Mining</i>		\$17	\$3	\$20	
Total Impact on Labor Income	\$2,819	\$1,809	\$1,411	\$6,038	9.6%
Value Added (\$ Millions)					
Industry Direct Impact	\$11,093			\$11,093	10.1%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$1,082	\$1,076	\$2,159	
<i>Finance, insurance, real estate, rental and leasing</i>		\$729	\$761	\$1,490	
<i>Wholesale and retail trade</i>		\$231	\$307	\$538	
<i>Transportation and warehousing</i>		\$265	\$74	\$339	
<i>Construction</i>		\$213	\$19	\$232	
<i>Government</i>		\$118	\$102	\$221	
<i>Utilities</i>		\$131	\$46	\$177	
<i>Manufacturing</i>		\$86	\$61	\$148	
<i>Information</i>		\$76	\$64	\$140	
<i>Mining</i>		\$60	\$9	\$69	
<i>Agriculture</i>		\$6	\$35	\$40	
Total Impact on Value Added	\$11,093	\$2,996	\$2,555	\$16,644	15.2%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-35. The Economic Impact of the Oil and Natural Gas Industry in New York, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	54,240			54,240	0.4%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		50,060	102,600	152,660	
<i>Finance, insurance, real estate, rental and leasing</i>		14,170	28,120	42,290	
<i>Wholesale and retail trade</i>		10,700	21,470	32,170	
<i>Transportation and warehousing</i>		12,400	9,740	22,140	
<i>Construction</i>		14,450	1,050	15,500	
<i>Manufacturing</i>		7,520	6,670	14,190	
<i>Information</i>		3,380	4,630	8,010	
<i>Government</i>		960	1,640	2,600	
<i>Agriculture</i>		420	1,300	1,720	
<i>Utilities</i>		870	580	1,450	
<i>Mining</i>		280	40	320	
Total Impact on Employment	54,240	115,210	177,840	347,290	2.8%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$6,087			\$6,087	0.5%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$6,195	\$7,975	\$14,170	
<i>Finance, insurance, real estate, rental and leasing</i>		\$2,969	\$4,668	\$7,637	
<i>Wholesale and retail trade</i>		\$1,072	\$1,588	\$2,661	
<i>Information</i>		\$1,201	\$1,435	\$2,636	
<i>Transportation and warehousing</i>		\$841	\$735	\$1,576	
<i>Construction</i>		\$1,206	\$89	\$1,295	
<i>Manufacturing</i>		\$715	\$552	\$1,267	
<i>Utilities</i>		\$292	\$185	\$476	
<i>Government</i>		\$154	\$237	\$391	
<i>Agriculture</i>		\$18	\$59	\$77	
<i>Mining</i>		\$13	\$2	\$15	
Total Impact on Labor Income	\$6,087	\$14,676	\$17,524	\$38,287	3.4%
Value Added (\$ Millions)					
Industry Direct Impact	\$15,735			\$15,735	0.8%
Indirect/Induced Impacts on Other Industries					
<i>Finance, insurance, real estate, rental and leasing</i>		\$7,831	\$12,434	\$20,265	
<i>Services</i>		\$7,159	\$9,669	\$16,829	
<i>Information</i>		\$2,363	\$2,856	\$5,220	
<i>Wholesale and retail trade</i>		\$1,587	\$2,723	\$4,310	
<i>Manufacturing</i>		\$1,147	\$1,128	\$2,275	
<i>Transportation and warehousing</i>		\$1,097	\$1,087	\$2,184	
<i>Construction</i>		\$1,351	\$122	\$1,473	
<i>Utilities</i>		\$741	\$480	\$1,221	
<i>Government</i>		\$189	\$290	\$479	
<i>Agriculture</i>		\$23	\$79	\$102	
<i>Mining</i>		\$43	\$6	\$49	
Total Impact on Value Added	\$15,735	\$23,530	\$30,877	\$70,142	3.7%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-36. The Economic Impact of the Oil and Natural Gas Industry in North Carolina, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	46,370			46,370	0.7%
Indirect/Induced Impacts on Other Industries					
Services		34,420	51,210	85,630	
Wholesale and retail trade		7,550	14,390	21,940	
Finance, insurance, real estate, rental and leasing		7,400	11,360	18,760	
Transportation and warehousing		11,760	4,850	16,610	
Manufacturing		8,440	7,140	15,580	
Construction		10,260	770	11,030	
Information		1,390	1,530	2,920	
Agriculture		500	1,720	2,220	
Government		900	1,200	2,100	
Utilities		530	280	810	
Mining		150	30	180	
Total Impact on Employment	46,370	83,310	94,480	224,160	3.6%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,930			\$2,930	0.7%
Indirect/Induced Impacts on Other Industries					
Services		\$2,704	\$2,913	\$5,617	
Finance, insurance, real estate, rental and leasing		\$668	\$833	\$1,500	
Wholesale and retail trade		\$645	\$771	\$1,416	
Manufacturing		\$713	\$510	\$1,223	
Transportation and warehousing		\$619	\$307	\$925	
Construction		\$628	\$49	\$676	
Information		\$170	\$180	\$350	
Government		\$87	\$111	\$198	
Utilities		\$120	\$63	\$183	
Agriculture		\$21	\$82	\$103	
Mining		\$7	\$1	\$8	
Total Impact on Labor Income	\$2,930	\$6,381	\$5,818	\$15,129	3.8%
Value Added (\$ Millions)					
Industry Direct Impact	\$8,029			\$8,029	1.2%
Indirect/Induced Impacts on Other Industries					
Services		\$3,279	\$3,573	\$6,851	
Finance, insurance, real estate, rental and leasing		\$2,142	\$3,034	\$5,176	
Manufacturing		\$1,325	\$1,473	\$2,799	
Wholesale and retail trade		\$963	\$1,280	\$2,243	
Transportation and warehousing		\$777	\$477	\$1,254	
Construction		\$691	\$65	\$756	
Information		\$317	\$344	\$661	
Utilities		\$389	\$206	\$595	
Government		\$107	\$137	\$244	
Agriculture		\$26	\$118	\$145	
Mining		\$47	\$8	\$54	
Total Impact on Value Added	\$8,029	\$10,063	\$10,716	\$28,809	4.4%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-37. The Economic Impact of the Oil and Natural Gas Industry in North Dakota, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	27,150			27,150	4.8%
Indirect/Induced Impacts on Other Industries					
Services		10,440	12,450	22,890	
Finance, insurance, real estate, rental and leasing		4,180	2,810	6,990	
Wholesale and retail trade		1,800	3,720	5,520	
Transportation and warehousing		2,290	870	3,160	
Construction		2,090	160	2,250	
Government		690	520	1,210	
Manufacturing		720	410	1,130	
Agriculture		160	720	880	
Information		450	290	740	
Utilities		310	110	420	
Mining		110	20	130	
Total Impact on Employment	27,150	23,240	22,070	72,460	12.8%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,661			\$2,661	7.3%
Indirect/Induced Impacts on Other Industries					
Services		\$674	\$678	\$1,352	
Finance, insurance, real estate, rental and leasing		\$274	\$145	\$419	
Wholesale and retail trade		\$154	\$175	\$329	
Transportation and warehousing		\$170	\$63	\$234	
Construction		\$141	\$11	\$153	
Agriculture		\$18	\$77	\$95	
Manufacturing		\$60	\$31	\$91	
Government		\$51	\$39	\$90	
Information		\$44	\$28	\$72	
Utilities		\$52	\$18	\$70	
Mining		\$12	\$2	\$14	
Total Impact on Labor Income	\$2,661	\$1,651	\$1,268	\$5,580	15.3%
Value Added (\$ Millions)					
Industry Direct Impact	\$12,086			\$12,086	19.0%
Indirect/Induced Impacts on Other Industries					
Services		\$789	\$800	\$1,589	
Finance, insurance, real estate, rental and leasing		\$680	\$508	\$1,188	
Wholesale and retail trade		\$253	\$264	\$517	
Transportation and warehousing		\$229	\$95	\$324	
Construction		\$182	\$16	\$198	
Utilities		\$132	\$46	\$178	
Manufacturing		\$115	\$52	\$168	
Information		\$75	\$48	\$123	
Agriculture		\$20	\$86	\$106	
Government		\$58	\$45	\$102	
Mining		\$34	\$5	\$39	
Total Impact on Value Added	\$12,086	\$2,567	\$1,965	\$16,618	26.1%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-38. The Economic Impact of the Oil and Natural Gas Industry in Ohio, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	71,160			71,160	1.0%
Indirect/Induced Impacts on Other Industries					
Services		61,600	80,880	142,480	
Wholesale and retail trade		10,550	20,730	31,280	
Finance, insurance, real estate, rental and leasing		11,710	15,880	27,590	
Transportation and warehousing		20,000	7,510	27,510	
Manufacturing		16,260	9,160	25,420	
Construction		12,740	1,000	13,740	
Information		2,270	2,200	4,470	
Government		1,810	1,650	3,460	
Agriculture		580	2,280	2,860	
Utilities		900	370	1,270	
Mining		260	30	290	
Total Impact on Employment	71,160	138,670	141,700	351,530	5.0%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$5,953			\$5,953	1.3%
Indirect/Induced Impacts on Other Industries					
Services		\$4,875	\$4,693	\$9,567	
Manufacturing		\$1,399	\$735	\$2,134	
Wholesale and retail trade		\$883	\$1,108	\$1,991	
Finance, insurance, real estate, rental and leasing		\$845	\$930	\$1,775	
Transportation and warehousing		\$1,298	\$474	\$1,772	
Construction		\$902	\$72	\$974	
Information		\$264	\$248	\$511	
Government		\$163	\$151	\$313	
Utilities		\$162	\$67	\$229	
Agriculture		\$27	\$82	\$109	
Mining		\$21	\$3	\$24	
Total Impact on Labor Income	\$5,953	\$10,838	\$8,562	\$25,354	5.7%
Value Added (\$ Millions)					
Industry Direct Impact	\$23,305			\$23,305	3.1%
Indirect/Induced Impacts on Other Industries					
Services		\$5,644	\$5,643	\$11,287	
Finance, insurance, real estate, rental and leasing		\$3,509	\$4,425	\$7,934	
Manufacturing		\$2,356	\$1,504	\$3,860	
Wholesale and retail trade		\$1,415	\$1,991	\$3,406	
Transportation and warehousing		\$1,526	\$628	\$2,154	
Construction		\$972	\$89	\$1,061	
Information		\$537	\$516	\$1,053	
Utilities		\$542	\$226	\$768	
Government		\$228	\$214	\$442	
Agriculture		\$36	\$121	\$157	
Mining		\$68	\$9	\$77	
Total Impact on Value Added	\$23,305	\$16,832	\$15,366	\$55,503	7.3%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-39. The Economic Impact of the Oil and Natural Gas Industry in Oklahoma, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	100,980			100,980	4.4%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		54,570	73,540	128,110	
<i>Finance, insurance, real estate, rental and leasing</i>		19,530	17,560	37,090	
<i>Wholesale and retail trade</i>		8,130	22,620	30,750	
<i>Transportation and warehousing</i>		12,420	5,660	18,080	
<i>Government</i>		5,550	5,220	10,770	
<i>Construction</i>		7,950	1,270	9,220	
<i>Manufacturing</i>		4,430	2,440	6,870	
<i>Information</i>		2,190	1,910	4,100	
<i>Agriculture</i>		410	2,780	3,190	
<i>Utilities</i>		1,120	460	1,580	
<i>Mining</i>		330	50	380	
Total Impact on Employment	100,980	116,640	133,520	351,150	15.3%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$18,224			\$18,224	13.3%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$3,601	\$3,780	\$7,381	
<i>Finance, insurance, real estate, rental and leasing</i>		\$1,095	\$721	\$1,816	
<i>Wholesale and retail trade</i>		\$585	\$957	\$1,542	
<i>Transportation and warehousing</i>		\$678	\$312	\$989	
<i>Government</i>		\$415	\$403	\$818	
<i>Construction</i>		\$443	\$74	\$517	
<i>Manufacturing</i>		\$342	\$162	\$504	
<i>Information</i>		\$200	\$171	\$371	
<i>Utilities</i>		\$156	\$66	\$222	
<i>Agriculture</i>		\$10	\$67	\$76	
<i>Mining</i>		\$53	\$8	\$61	
Total Impact on Labor Income	\$18,224	\$7,577	\$6,720	\$32,522	23.8%
Value Added (\$ Millions)					
Industry Direct Impact	\$34,748			\$34,748	16.1%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$4,226	\$4,559	\$8,786	
<i>Finance, insurance, real estate, rental and leasing</i>		\$2,708	\$3,129	\$5,838	
<i>Wholesale and retail trade</i>		\$1,017	\$1,605	\$2,622	
<i>Transportation and warehousing</i>		\$928	\$460	\$1,388	
<i>Government</i>		\$551	\$536	\$1,088	
<i>Manufacturing</i>		\$572	\$303	\$874	
<i>Information</i>		\$375	\$350	\$725	
<i>Utilities</i>		\$483	\$205	\$688	
<i>Construction</i>		\$484	\$86	\$570	
<i>Agriculture</i>		\$9	\$85	\$94	
<i>Mining</i>		\$81	\$13	\$94	
Total Impact on Value Added	\$34,748	\$11,435	\$11,331	\$57,514	26.7%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-40. The Economic Impact of the Oil and Natural Gas Industry in Oregon, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	17,170			17,170	0.7%
Indirect/Induced Impacts on Other Industries					
Services		13,810	22,650	36,460	
Wholesale and retail trade		2,990	6,170	9,160	
Finance, insurance, real estate, rental and leasing		3,000	4,510	7,510	
Manufacturing		3,820	2,750	6,570	
Transportation and warehousing		4,140	2,260	6,400	
Construction		3,960	320	4,280	
Agriculture		580	1,670	2,250	
Information		530	590	1,120	
Government		450	540	990	
Utilities		200	110	310	
Mining		100	20	120	
Total Impact on Employment	17,170	33,570	41,580	92,320	3.6%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,397			\$1,397	0.8%
Indirect/Induced Impacts on Other Industries					
Services		\$1,204	\$1,430	\$2,635	
Wholesale and retail trade		\$256	\$351	\$607	
Manufacturing		\$368	\$212	\$580	
Finance, insurance, real estate, rental and leasing		\$252	\$301	\$553	
Transportation and warehousing		\$262	\$161	\$423	
Construction		\$313	\$26	\$339	
Information		\$74	\$79	\$153	
Agriculture		\$32	\$79	\$111	
Government		\$51	\$59	\$109	
Utilities		\$40	\$22	\$63	
Mining		\$6	\$1	\$7	
Total Impact on Labor Income	\$1,397	\$2,860	\$2,721	\$6,978	3.9%
Value Added (\$ Millions)					
Industry Direct Impact	\$3,553			\$3,553	1.3%
Indirect/Induced Impacts on Other Industries					
Services		\$1,435	\$1,748	\$3,183	
Finance, insurance, real estate, rental and leasing		\$657	\$1,133	\$1,790	
Manufacturing		\$671	\$396	\$1,067	
Wholesale and retail trade		\$359	\$525	\$884	
Transportation and warehousing		\$336	\$248	\$584	
Construction		\$324	\$31	\$355	
Information		\$128	\$136	\$264	
Utilities		\$128	\$71	\$200	
Government		\$65	\$77	\$142	
Agriculture		\$33	\$82	\$115	
Mining		\$16	\$3	\$18	
Total Impact on Value Added	\$3,553	\$4,152	\$4,449	\$12,154	4.5%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-41. The Economic Impact of the Oil and Natural Gas Industry in Pennsylvania, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	93,060			93,060	1.2%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		62,410	110,330	172,740	
<i>Finance, insurance, real estate, rental and leasing</i>		15,020	23,240	38,260	
<i>Wholesale and retail trade</i>		11,180	26,070	37,250	
<i>Transportation and warehousing</i>		20,040	10,080	30,120	
<i>Manufacturing</i>		13,560	8,650	22,210	
<i>Construction</i>		14,430	1,340	15,770	
<i>Government</i>		2,670	2,370	5,040	
<i>Information</i>		2,080	2,490	4,570	
<i>Agriculture</i>		560	1,910	2,470	
<i>Utilities</i>		1,010	530	1,540	
<i>Mining</i>		560	90	650	
Total Impact on Employment	93,060	143,530	187,110	423,700	5.6%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$14,285			\$14,285	2.7%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$5,785	\$7,345	\$13,130	
<i>Finance, insurance, real estate, rental and leasing</i>		\$1,306	\$1,658	\$2,963	
<i>Wholesale and retail trade</i>		\$1,043	\$1,485	\$2,528	
<i>Transportation and warehousing</i>		\$1,299	\$672	\$1,971	
<i>Manufacturing</i>		\$1,218	\$750	\$1,968	
<i>Information</i>		\$629	\$656	\$1,285	
<i>Construction</i>		\$1,108	\$108	\$1,216	
<i>Government</i>		\$252	\$235	\$487	
<i>Utilities</i>		\$198	\$105	\$303	
<i>Agriculture</i>		\$25	\$73	\$98	
<i>Mining</i>		\$46	\$7	\$53	
Total Impact on Labor Income	\$14,285	\$12,908	\$13,093	\$40,286	7.5%
Value Added (\$ Millions)					
Industry Direct Impact	\$35,895			\$35,895	4.3%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$6,533	\$8,511	\$15,045	
<i>Finance, insurance, real estate, rental and leasing</i>		\$3,277	\$5,676	\$8,953	
<i>Wholesale and retail trade</i>		\$1,569	\$2,429	\$3,997	
<i>Manufacturing</i>		\$2,099	\$1,480	\$3,579	
<i>Transportation and warehousing</i>		\$1,460	\$860	\$2,320	
<i>Information</i>		\$1,006	\$1,159	\$2,166	
<i>Construction</i>		\$1,135	\$125	\$1,259	
<i>Utilities</i>		\$609	\$327	\$936	
<i>Government</i>		\$332	\$312	\$643	
<i>Agriculture</i>		\$30	\$100	\$131	
<i>Mining</i>		\$91	\$15	\$106	
Total Impact on Value Added	\$35,895	\$18,141	\$20,994	\$75,030	8.9%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-42. The Economic Impact of the Oil and Natural Gas Industry in Rhode Island, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	4,520			4,520	0.7%
Indirect/Induced Impacts on Other Industries					
Services		3,880	6,670	10,550	
Finance, insurance, real estate, rental and leasing		1,030	1,430	2,460	
Wholesale and retail trade		740	1,370	2,110	
Manufacturing		800	560	1,360	
Transportation and warehousing		840	440	1,280	
Construction		900	80	980	
Information		140	150	290	
Government		70	110	180	
Utilities		50	30	80	
Agriculture		10	60	70	
Mining		20	**	20	
Total Impact on Employment	4,520	8,480	10,910	23,900	3.7%
Labor Income*** (\$ Millions)					
Industry Direct Impact	\$593			\$593	1.4%
Indirect/Induced Impacts on Other Industries					
Services		\$319	\$407	\$727	
Finance, insurance, real estate, rental and leasing		\$90	\$105	\$195	
Wholesale and retail trade		\$71	\$82	\$153	
Manufacturing		\$67	\$42	\$109	
Construction		\$68	\$6	\$74	
Transportation and warehousing		\$43	\$22	\$65	
Information		\$16	\$18	\$34	
Government		\$9	\$12	\$20	
Utilities		\$7	\$4	\$11	
Agriculture		\$0	\$2	\$2	
Mining		\$1	****	\$1	
Total Impact on Labor Income	\$593	\$691	\$700	\$1,984	4.6%
Value Added (\$ Millions)					
Industry Direct Impact	\$1,442			\$1,442	2.2%
Indirect/Induced Impacts on Other Industries					
Services		\$371	\$503	\$873	
Finance, insurance, real estate, rental and leasing		\$242	\$368	\$611	
Wholesale and retail trade		\$104	\$135	\$240	
Manufacturing		\$99	\$67	\$166	
Transportation and warehousing		\$48	\$28	\$76	
Construction		\$68	\$7	\$75	
Information		\$30	\$32	\$62	
Utilities		\$34	\$18	\$51	
Government		\$13	\$18	\$31	
Mining		\$3	****	\$4	
Agriculture		\$1	\$3	\$3	
Total Impact on Value Added	\$1,442	\$1,012	\$1,179	\$3,634	5.5%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs. ** Less than 5 jobs.

*** Labor income is defined as wages and salaries and benefits as well as proprietors' income. **** Less than \$0.5 million.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-43. The Economic Impact of the Oil and Natural Gas Industry in South Carolina, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	26,630			26,630	0.9%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		16,230	22,780	39,010	
<i>Wholesale and retail trade</i>		3,370	6,290	9,660	
<i>Manufacturing</i>		5,120	3,340	8,460	
<i>Finance, insurance, real estate, rental and leasing</i>		3,530	4,900	8,430	
<i>Transportation and warehousing</i>		5,830	2,010	7,840	
<i>Construction</i>		4,380	340	4,720	
<i>Government</i>		1,230	620	1,850	
<i>Information</i>		750	740	1,490	
<i>Agriculture</i>		300	700	1,000	
<i>Utilities</i>		400	230	630	
<i>Mining</i>		90	10	100	
Total Impact on Employment	26,630	41,220	41,950	109,800	3.8%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,054			\$1,054	0.6%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$1,015	\$1,117	\$2,132	
<i>Manufacturing</i>		\$432	\$252	\$684	
<i>Wholesale and retail trade</i>		\$250	\$298	\$547	
<i>Finance, insurance, real estate, rental and leasing</i>		\$247	\$267	\$514	
<i>Transportation and warehousing</i>		\$310	\$115	\$425	
<i>Construction</i>		\$268	\$21	\$289	
<i>Information</i>		\$132	\$120	\$252	
<i>Government</i>		\$101	\$53	\$154	
<i>Utilities</i>		\$60	\$34	\$94	
<i>Agriculture</i>		\$9	\$15	\$24	
<i>Mining</i>		\$8	\$1	\$9	
Total Impact on Labor Income	\$1,054	\$2,831	\$2,294	\$6,178	3.7%
Value Added (\$ Millions)					
Industry Direct Impact	\$4,839			\$4,839	1.8%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$1,187	\$1,376	\$2,564	
<i>Finance, insurance, real estate, rental and leasing</i>		\$702	\$1,106	\$1,809	
<i>Manufacturing</i>		\$808	\$455	\$1,262	
<i>Wholesale and retail trade</i>		\$420	\$522	\$942	
<i>Transportation and warehousing</i>		\$370	\$154	\$525	
<i>Information</i>		\$180	\$169	\$349	
<i>Construction</i>		\$312	\$31	\$343	
<i>Utilities</i>		\$196	\$113	\$310	
<i>Government</i>		\$126	\$69	\$196	
<i>Agriculture</i>		\$12	\$27	\$40	
<i>Mining</i>		\$27	\$4	\$32	
Total Impact on Value Added	\$4,839	\$4,342	\$4,028	\$13,209	4.9%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-44. The Economic Impact of the Oil and Natural Gas Industry in South Dakota, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	9,470			9,470	1.5%
Indirect/Induced Impacts on Other Industries					
Services		3,570	5,360	8,930	
Wholesale and retail trade		790	1,480	2,270	
Finance, insurance, real estate, rental and leasing		1,010	1,220	2,230	
Manufacturing		840	680	1,520	
Construction		1,080	80	1,160	
Transportation and warehousing		810	330	1,140	
Agriculture		150	770	920	
Information		230	210	440	
Government		260	180	440	
Utilities		90	40	130	
Mining		40	10	50	
Total Impact on Employment	9,470	8,870	10,350	28,700	4.6%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$405			\$405	1.0%
Indirect/Induced Impacts on Other Industries					
Services		\$227	\$300	\$527	
Finance, insurance, real estate, rental and leasing		\$72	\$75	\$147	
Wholesale and retail trade		\$58	\$72	\$130	
Manufacturing		\$77	\$49	\$126	
Agriculture		\$18	\$91	\$110	
Information		\$41	\$36	\$77	
Construction		\$68	\$5	\$74	
Transportation and warehousing		\$44	\$18	\$63	
Government		\$18	\$13	\$31	
Utilities		\$12	\$5	\$17	
Mining		\$3	\$1	\$4	
Total Impact on Labor Income	\$405	\$639	\$666	\$1,709	4.4%
Value Added (\$ Millions)					
Industry Direct Impact	\$1,174			\$1,174	1.9%
Indirect/Induced Impacts on Other Industries					
Finance, insurance, real estate, rental and leasing		\$303	\$334	\$637	
Services		\$272	\$358	\$630	
Wholesale and retail trade		\$90	\$117	\$207	
Manufacturing		\$100	\$65	\$164	
Agriculture		\$20	\$107	\$127	
Information		\$67	\$59	\$126	
Transportation and warehousing		\$55	\$24	\$79	
Construction		\$66	\$6	\$72	
Utilities		\$44	\$20	\$64	
Government		\$22	\$16	\$38	
Mining		\$8	\$1	\$9	
Total Impact on Value Added	\$1,174	\$1,046	\$1,107	\$3,327	5.4%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-45. The Economic Impact of the Oil and Natural Gas Industry in Tennessee, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	36,220			36,220	0.9%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		24,580	39,040	63,620	
<i>Transportation and warehousing</i>		10,510	4,430	14,940	
<i>Wholesale and retail trade</i>		4,750	10,000	14,750	
<i>Finance, insurance, real estate, rental and leasing</i>		4,930	7,610	12,540	
<i>Manufacturing</i>		7,080	5,080	12,160	
<i>Construction</i>		6,990	550	7,540	
<i>Information</i>		1,210	1,300	2,510	
<i>Agriculture</i>		460	1,680	2,140	
<i>Government</i>		460	880	1,340	
<i>Utilities</i>		620	340	960	
<i>Mining</i>		190	30	220	
Total Impact on Employment	36,220	61,780	70,940	168,940	4.0%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,697			\$2,697	1.0%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$1,897	\$2,497	\$4,393	
<i>Manufacturing</i>		\$607	\$419	\$1,026	
<i>Transportation and warehousing</i>		\$689	\$310	\$998	
<i>Wholesale and retail trade</i>		\$391	\$561	\$953	
<i>Finance, insurance, real estate, rental and leasing</i>		\$404	\$542	\$945	
<i>Construction</i>		\$533	\$43	\$576	
<i>Information</i>		\$141	\$147	\$287	
<i>Utilities</i>		\$100	\$54	\$154	
<i>Government</i>		\$40	\$70	\$111	
<i>Agriculture</i>		\$9	\$17	\$26	
<i>Mining</i>		\$19	\$3	\$21	
Total Impact on Labor Income	\$2,697	\$4,830	\$4,662	\$12,189	4.4%
Value Added (\$ Millions)					
Industry Direct Impact	\$7,569			\$7,569	1.8%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$2,221	\$3,022	\$5,243	
<i>Finance, insurance, real estate, rental and leasing</i>		\$1,149	\$1,864	\$3,013	
<i>Manufacturing</i>		\$1,056	\$894	\$1,950	
<i>Wholesale and retail trade</i>		\$636	\$988	\$1,625	
<i>Transportation and warehousing</i>		\$832	\$408	\$1,240	
<i>Construction</i>		\$509	\$45	\$555	
<i>Information</i>		\$252	\$271	\$523	
<i>Utilities</i>		\$240	\$132	\$372	
<i>Government</i>		\$54	\$94	\$148	
<i>Mining</i>		\$57	\$9	\$66	
<i>Agriculture</i>		\$13	\$39	\$52	
Total Impact on Value Added	\$7,569	\$7,020	\$7,766	\$22,355	5.2%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Table B-46. The Economic Impact of the Oil and Natural Gas Industry in Texas, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	507,850			507,850	2.8%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		427,590	609,390	1,036,980	
<i>Finance, insurance, real estate, rental and leasing</i>		111,300	159,840	271,140	
<i>Wholesale and retail trade</i>		54,110	176,610	230,720	
<i>Transportation and warehousing</i>		101,240	56,580	157,820	
<i>Construction</i>		65,180	9,350	74,530	
<i>Manufacturing</i>		41,960	25,890	67,850	
<i>Information</i>		16,850	22,680	39,530	
<i>Government</i>		15,590	20,920	36,510	
<i>Agriculture</i>		2,210	15,530	17,740	
<i>Utilities</i>		8,610	4,300	12,910	
<i>Mining</i>		2,120	310	2,430	
Total Impact on Employment	507,850	846,750	1,101,390	2,455,990	13.4%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$100,858			\$100,858	8.3%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$37,055	\$33,043	\$70,098	
<i>Finance, insurance, real estate, rental and leasing</i>		\$8,981	\$9,732	\$18,713	
<i>Wholesale and retail trade</i>		\$4,931	\$9,297	\$14,228	
<i>Transportation and warehousing</i>		\$5,861	\$2,988	\$8,848	
<i>Manufacturing</i>		\$4,679	\$2,009	\$6,687	
<i>Construction</i>		\$4,541	\$647	\$5,188	
<i>Information</i>		\$2,102	\$2,676	\$4,778	
<i>Government</i>		\$1,301	\$1,705	\$3,005	
<i>Utilities</i>		\$1,584	\$777	\$2,360	
<i>Agriculture</i>		\$54	\$309	\$363	
<i>Mining</i>		\$246	\$37	\$284	
Total Impact on Labor Income	\$100,858	\$71,333	\$63,220	\$235,411	19.3%
Value Added (\$ Millions)					
Industry Direct Impact	\$244,095			\$244,095	11.9%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$41,686	\$38,756	\$80,442	
<i>Finance, insurance, real estate, rental and leasing</i>		\$19,794	\$31,184	\$50,979	
<i>Wholesale and retail trade</i>		\$9,163	\$16,443	\$25,606	
<i>Manufacturing</i>		\$11,077	\$4,220	\$15,297	
<i>Transportation and warehousing</i>		\$7,120	\$4,107	\$11,227	
<i>Information</i>		\$3,840	\$5,449	\$9,290	
<i>Utilities</i>		\$4,386	\$2,161	\$6,547	
<i>Construction</i>		\$5,069	\$784	\$5,852	
<i>Government</i>		\$1,613	\$2,117	\$3,730	
<i>Mining</i>		\$718	\$109	\$827	
<i>Agriculture</i>		\$73	\$541	\$613	
Total Impact on Value Added	\$244,095	\$104,540	\$105,871	\$454,506	22.2%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-47. The Economic Impact of the Oil and Natural Gas Industry in Utah, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	19,780			19,780	0.9%
Indirect/Induced Impacts on Other Industries					
Services		18,950	21,830	40,780	
Finance, insurance, real estate, rental and leasing		4,290	6,120	10,410	
Wholesale and retail trade		2,980	6,610	9,590	
Transportation and warehousing		6,060	2,290	8,350	
Construction		5,470	360	5,830	
Manufacturing		2,590	2,230	4,820	
Information		1,040	1,160	2,200	
Government		790	600	1,390	
Agriculture		140	550	690	
Utilities		300	100	400	
Mining		280	50	330	
Total Impact on Employment	19,780	42,900	41,910	104,590	4.7%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,559			\$1,559	1.2%
Indirect/Induced Impacts on Other Industries					
Services		\$1,331	\$1,152	\$2,483	
Finance, insurance, real estate, rental and leasing		\$311	\$310	\$621	
Wholesale and retail trade		\$245	\$373	\$618	
Transportation and warehousing		\$412	\$180	\$592	
Construction		\$382	\$26	\$408	
Manufacturing		\$202	\$162	\$365	
Information		\$121	\$129	\$250	
Government		\$64	\$49	\$113	
Utilities		\$79	\$28	\$107	
Mining		\$27	\$4	\$31	
Agriculture		\$4	\$22	\$26	
Total Impact on Labor Income	\$1,559	\$3,177	\$2,435	\$7,171	5.3%
Value Added (\$ Millions)					
Industry Direct Impact	\$5,752			\$5,752	2.6%
Indirect/Induced Impacts on Other Industries					
Services		\$1,567	\$1,401	\$2,969	
Finance, insurance, real estate, rental and leasing		\$933	\$1,211	\$2,145	
Wholesale and retail trade		\$366	\$609	\$974	
Transportation and warehousing		\$536	\$283	\$818	
Manufacturing		\$378	\$296	\$675	
Construction		\$505	\$42	\$547	
Information		\$245	\$260	\$506	
Utilities		\$229	\$82	\$311	
Government		\$85	\$67	\$152	
Mining		\$129	\$21	\$150	
Agriculture		\$4	\$26	\$30	
Total Impact on Value Added	\$5,752	\$4,979	\$4,298	\$15,029	6.7%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-48. The Economic Impact of the Oil and Natural Gas Industry in Vermont, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	5,480			5,480	1.3%
Indirect/Induced Impacts on Other Industries					
Services		2,630	4,220	6,850	
Wholesale and retail trade		390	920	1,310	
Finance, insurance, real estate, rental and leasing		550	670	1,220	
Manufacturing		490	460	950	
Construction		760	60	820	
Transportation and warehousing		590	220	810	
Agriculture		90	230	320	
Information		120	80	200	
Government		70	80	150	
Utilities		50	30	80	
Mining		30	**	30	
Total Impact on Employment	5,480	5,770	6,990	18,230	4.3%
Labor Income*** (\$ Millions)					
Industry Direct Impact	\$275			\$275	1.1%
Indirect/Induced Impacts on Other Industries					
Services		\$185	\$234	\$418	
Finance, insurance, real estate, rental and leasing		\$38	\$41	\$80	
Wholesale and retail trade		\$27	\$47	\$74	
Manufacturing		\$38	\$32	\$70	
Construction		\$44	\$4	\$48	
Transportation and warehousing		\$33	\$14	\$47	
Information		\$12	\$8	\$20	
Utilities		\$10	\$5	\$16	
Government		\$6	\$7	\$14	
Agriculture		\$2	\$7	\$10	
Mining		\$2	****	\$2	
Total Impact on Labor Income	\$275	\$398	\$400	\$1,073	4.4%
Value Added (\$ Millions)					
Industry Direct Impact	\$789			\$789	2.1%
Indirect/Induced Impacts on Other Industries					
Services		\$222	\$292	\$514	
Finance, insurance, real estate, rental and leasing		\$125	\$192	\$317	
Wholesale and retail trade		\$42	\$79	\$121	
Manufacturing		\$56	\$45	\$101	
Transportation and warehousing		\$40	\$20	\$60	
Construction		\$42	\$4	\$46	
Utilities		\$26	\$13	\$40	
Information		\$21	\$14	\$35	
Government		\$8	\$9	\$17	
Agriculture		\$3	\$10	\$12	
Mining		\$8	\$1	\$9	
Total Impact on Value Added	\$789	\$592	\$679	\$2,060	5.6%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs. ** Less than 5 jobs.

*** Labor income is defined as wages and salaries and benefits as well as proprietors' income. **** Less than \$0.5 million.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-49. The Economic Impact of the Oil and Natural Gas Industry in Virginia, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	41,520			41,520	0.8%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		31,670	43,000	74,670	
<i>Wholesale and retail trade</i>		5,460	10,260	15,720	
<i>Finance, insurance, real estate, rental and leasing</i>		5,480	8,400	13,880	
<i>Transportation and warehousing</i>		9,170	4,300	13,470	
<i>Construction</i>		8,420	600	9,020	
<i>Manufacturing</i>		5,330	3,440	8,770	
<i>Information</i>		1,640	1,890	3,530	
<i>Government</i>		1,230	1,270	2,500	
<i>Agriculture</i>		360	1,140	1,500	
<i>Utilities</i>		370	190	560	
<i>Mining</i>		250	40	290	
Total Impact on Employment	41,520	69,390	74,520	185,430	3.5%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,473			\$2,473	0.6%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$3,303	\$2,814	\$6,117	
<i>Wholesale and retail trade</i>		\$487	\$532	\$1,020	
<i>Finance, insurance, real estate, rental and leasing</i>		\$435	\$532	\$967	
<i>Transportation and warehousing</i>		\$547	\$264	\$811	
<i>Manufacturing</i>		\$450	\$239	\$689	
<i>Construction</i>		\$550	\$40	\$591	
<i>Information</i>		\$250	\$269	\$519	
<i>Government</i>		\$141	\$144	\$285	
<i>Utilities</i>		\$82	\$40	\$122	
<i>Agriculture</i>		\$11	\$25	\$37	
<i>Mining</i>		\$20	\$3	\$23	
Total Impact on Labor Income	\$2,473	\$6,276	\$4,904	\$13,653	3.6%
Value Added (\$ Millions)					
Industry Direct Impact	\$8,599			\$8,599	1.4%
Indirect/Induced Impacts on Other Industries					
<i>Services</i>		\$3,864	\$3,455	\$7,319	
<i>Finance, insurance, real estate, rental and leasing</i>		\$1,440	\$2,276	\$3,716	
<i>Wholesale and retail trade</i>		\$774	\$968	\$1,742	
<i>Manufacturing</i>		\$790	\$754	\$1,545	
<i>Information</i>		\$487	\$530	\$1,018	
<i>Transportation and warehousing</i>		\$657	\$339	\$996	
<i>Construction</i>		\$659	\$61	\$720	
<i>Utilities</i>		\$289	\$144	\$433	
<i>Government</i>		\$198	\$205	\$403	
<i>Mining</i>		\$51	\$7	\$58	
<i>Agriculture</i>		\$14	\$42	\$56	
Total Impact on Value Added	\$8,599	\$9,224	\$8,782	\$26,606	4.4%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Table B-50. The Economic Impact of the Oil and Natural Gas Industry in Washington, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	24,410			24,410	0.5%
Indirect/Induced Impacts on Other Industries					
Services		23,550	36,520	60,070	
Wholesale and retail trade		5,270	10,770	16,040	
Transportation and warehousing		8,730	4,750	13,480	
Finance, insurance, real estate, rental and leasing		4,410	7,900	12,310	
Construction		9,150	580	9,730	
Manufacturing		4,010	3,370	7,380	
Agriculture		760	2,510	3,270	
Information		1,360	1,710	3,070	
Government		1,670	1,220	2,890	
Utilities		530	230	760	
Mining		180	20	200	
Total Impact on Employment	24,410	59,620	69,580	153,610	3.4%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$2,233			\$2,233	0.6%
Indirect/Induced Impacts on Other Industries					
Services		\$2,524	\$2,492	\$5,016	
Transportation and warehousing		\$913	\$729	\$1,642	
Wholesale and retail trade		\$520	\$1,038	\$1,558	
Finance, insurance, real estate, rental and leasing		\$405	\$586	\$991	
Information		\$387	\$446	\$833	
Construction		\$781	\$50	\$831	
Manufacturing		\$367	\$257	\$624	
Government		\$181	\$135	\$316	
Agriculture		\$46	\$158	\$204	
Utilities		\$102	\$44	\$146	
Mining		\$17	\$2	\$19	
Total Impact on Labor Income	\$2,233	\$6,243	\$5,936	\$14,412	3.7%
Value Added (\$ Millions)					
Industry Direct Impact	\$12,443			\$12,443	1.8%
Indirect/Induced Impacts on Other Industries					
Services		\$3,114	\$3,171	\$6,285	
Finance, insurance, real estate, rental and leasing		\$1,262	\$2,372	\$3,634	
Transportation and warehousing		\$1,458	\$1,499	\$2,956	
Wholesale and retail trade		\$819	\$1,789	\$2,608	
Information		\$709	\$843	\$1,552	
Manufacturing		\$678	\$464	\$1,141	
Construction		\$888	\$67	\$955	
Utilities		\$325	\$142	\$467	
Government		\$229	\$175	\$404	
Agriculture		\$44	\$147	\$191	
Mining		\$32	\$4	\$36	
Total Impact on Value Added	\$12,443	\$9,557	\$10,670	\$32,670	4.8%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Table B-51. The Economic Impact of the Oil and Natural Gas Industry in West Virginia, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	25,460			25,460	3.0%
Indirect/Induced Impacts on Other Industries					
Services		12,210	13,720	25,930	
Wholesale and retail trade		1,950	3,410	5,360	
Finance, insurance, real estate, rental and leasing		3,170	2,090	5,260	
Transportation and warehousing		2,790	800	3,590	
Construction		2,190	170	2,360	
Manufacturing		1,260	650	1,910	
Government		510	430	940	
Agriculture		190	620	810	
Information		380	230	610	
Mining		460	80	540	
Utilities		250	100	350	
Total Impact on Employment	25,460	25,370	22,290	73,120	8.5%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,884			\$1,884	3.9%
Indirect/Induced Impacts on Other Industries					
Services		\$807	\$727	\$1,534	
Finance, insurance, real estate, rental and leasing		\$202	\$108	\$309	
Wholesale and retail trade		\$127	\$137	\$264	
Transportation and warehousing		\$173	\$47	\$220	
Manufacturing		\$113	\$53	\$165	
Construction		\$132	\$10	\$143	
Government		\$37	\$32	\$69	
Mining		\$50	\$9	\$60	
Utilities		\$41	\$17	\$58	
Information		\$32	\$19	\$51	
Agriculture		\$3	\$3	\$6	
Total Impact on Labor Income	\$1,884	\$1,717	\$1,161	\$4,762	9.9%
Value Added (\$ Millions)					
Industry Direct Impact	\$8,132			\$8,132	9.5%
Indirect/Induced Impacts on Other Industries					
Services		\$862	\$839	\$1,701	
Finance, insurance, real estate, rental and leasing		\$572	\$542	\$1,114	
Wholesale and retail trade		\$220	\$239	\$459	
Manufacturing		\$217	\$110	\$327	
Mining		\$248	\$45	\$293	
Transportation and warehousing		\$213	\$60	\$273	
Construction		\$166	\$15	\$181	
Utilities		\$120	\$49	\$168	
Information		\$63	\$39	\$102	
Government		\$51	\$44	\$95	
Agriculture		\$4	\$8	\$12	
Total Impact on Value Added	\$8,132	\$2,735	\$1,989	\$12,856	15.0%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-52. The Economic Impact of the Oil and Natural Gas Industry in Wisconsin, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	38,410			38,410	1.0%
Indirect/Induced Impacts on Other Industries					
Services		18,900	30,890	49,790	
Manufacturing		9,930	6,380	16,310	
Wholesale and retail trade		4,110	8,300	12,410	
Finance, insurance, real estate, rental and leasing		4,590	6,470	11,060	
Transportation and warehousing		7,470	2,920	10,390	
Construction		5,540	410	5,950	
Agriculture		540	1,980	2,520	
Government		810	720	1,530	
Information		790	710	1,500	
Utilities		340	160	500	
Mining		140	20	160	
Total Impact on Employment	38,410	53,150	58,970	150,530	4.1%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$1,751			\$1,751	0.7%
Indirect/Induced Impacts on Other Industries					
Services		\$1,384	\$1,792	\$3,176	
Manufacturing		\$821	\$499	\$1,320	
Finance, insurance, real estate, rental and leasing		\$339	\$429	\$768	
Wholesale and retail trade		\$312	\$425	\$737	
Transportation and warehousing		\$462	\$207	\$669	
Construction		\$402	\$30	\$432	
Information		\$90	\$78	\$168	
Government		\$69	\$62	\$131	
Agriculture		\$26	\$94	\$119	
Utilities		\$64	\$31	\$95	
Mining		\$11	\$2	\$13	
Total Impact on Labor Income	\$1,751	\$3,980	\$3,649	\$9,380	4.0%
Value Added (\$ Millions)					
Industry Direct Impact	\$4,653			\$4,653	1.3%
Indirect/Induced Impacts on Other Industries					
Services		\$1,657	\$2,191	\$3,848	
Finance, insurance, real estate, rental and leasing		\$1,074	\$1,616	\$2,690	
Manufacturing		\$1,282	\$844	\$2,126	
Wholesale and retail trade		\$482	\$718	\$1,200	
Transportation and warehousing		\$593	\$325	\$919	
Construction		\$420	\$37	\$458	
Information		\$171	\$154	\$325	
Utilities		\$203	\$98	\$301	
Government		\$86	\$79	\$164	
Agriculture		\$31	\$127	\$159	
Mining		\$26	\$4	\$30	
Total Impact on Value Added	\$4,653	\$6,025	\$6,195	\$16,874	4.6%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Impacts of the Oil and Natural Gas Industry on the US Economy

Table B-53. The Economic Impact of the Oil and Natural Gas Industry in Wyoming, 2021

Sector Description	Direct	Indirect	Induced	Total	As a % of State Total
Employment*					
Industry Direct Impact	20,340			20,340	5.0%
Indirect/Induced Impacts on Other Industries					
Services		8,070	9,690	17,760	
Finance, insurance, real estate, rental and leasing		3,200	3,440	6,640	
Wholesale and retail trade		1,430	3,190	4,620	
Transportation and warehousing		2,780	590	3,370	
Construction		2,380	190	2,570	
Government		700	500	1,200	
Manufacturing		380	190	570	
Agriculture		100	450	550	
Information		260	210	470	
Mining		330	50	380	
Utilities		240	70	310	
Total Impact on Employment	20,340	19,870	18,570	58,780	14.4%
Labor Income** (\$ Millions)					
Industry Direct Impact	\$3,548			\$3,548	14.6%
Indirect/Induced Impacts on Other Industries					
Services		\$485	\$445	\$931	
Finance, insurance, real estate, rental and leasing		\$153	\$121	\$274	
Transportation and warehousing		\$195	\$40	\$235	
Wholesale and retail trade		\$86	\$124	\$210	
Construction		\$142	\$12	\$154	
Government		\$57	\$43	\$100	
Utilities		\$41	\$13	\$54	
Mining		\$44	\$7	\$51	
Manufacturing		\$30	\$10	\$40	
Information		\$22	\$18	\$40	
Agriculture		\$3	\$18	\$21	
Total Impact on Labor Income	\$3,548	\$1,259	\$852	\$5,660	23.3%
Value Added (\$ Millions)					
Industry Direct Impact	\$8,332			\$8,332	20.1%
Indirect/Induced Impacts on Other Industries					
Services		\$567	\$551	\$1,118	
Finance, insurance, real estate, rental and leasing		\$389	\$510	\$899	
Transportation and warehousing		\$317	\$64	\$381	
Wholesale and retail trade		\$154	\$206	\$360	
Construction		\$193	\$18	\$211	
Utilities		\$106	\$34	\$140	
Mining		\$116	\$19	\$135	
Government		\$68	\$52	\$119	
Manufacturing		\$58	\$20	\$78	
Information		\$41	\$35	\$76	
Agriculture		\$3	\$18	\$21	
Total Impact on Value Added	\$8,332	\$2,012	\$1,527	\$11,871	28.6%

Source: PwC calculations based on the IMPLAN modeling system (2021 database). Details may not add up to totals due to rounding.

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Appendix C: Detailed Results by Congressional District

Table C-1. Economic Impact of the Oil and Natural Gas Industry in Alabama, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Alabama	31,880	125,860	4.6%	\$1,880	\$7,486	4.8%	\$6,603	\$15,918	6.3%
AL-1	6,000	23,680	6.0%	\$360	\$1,379	6.4%	\$2,344	\$4,495	12.9%
AL-2	3,780	15,130	4.1%	\$191	\$813	4.1%	\$573	\$1,641	4.7%
AL-3	4,690	16,340	4.4%	\$219	\$803	4.5%	\$703	\$1,606	5.5%
AL-4	4,970	17,150	4.4%	\$220	\$835	4.4%	\$678	\$1,693	5.4%
AL-5	2,360	14,750	3.5%	\$148	\$990	3.6%	\$327	\$1,611	3.9%
AL-6	3,260	18,000	4.1%	\$215	\$1,209	4.4%	\$679	\$2,223	4.9%
AL-7	6,810	20,820	5.8%	\$528	\$1,457	6.4%	\$1,299	\$2,648	7.0%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-2. Economic Impact of the Oil and Natural Gas Industry in Alaska, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Alaska	12,220	36,820	8.3%	\$2,053	\$3,713	11.1%	\$13,472	\$16,113	28.1%
AK-1 (At-Large)	12,220	36,820	8.3%	\$2,053	\$3,713	11.1%	\$13,472	\$16,113	28.1%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-3. Economic Impact of the Oil and Natural Gas Industry in Arizona, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Arizona	28,440	153,840	3.8%	\$1,851	\$10,555	4.1%	\$4,515	\$18,504	4.4%
AZ-1	5,280	22,760	4.3%	\$181	\$1,275	4.2%	\$270	\$2,277	4.4%
AZ-2	4,640	17,150	4.5%	\$343	\$1,110	4.7%	\$816	\$2,024	5.4%
AZ-3	3,250	17,530	4.0%	\$266	\$1,233	4.4%	\$1,033	\$2,504	5.5%
AZ-4	2,070	18,330	3.3%	\$111	\$1,068	3.7%	\$382	\$2,028	4.1%
AZ-5	1,160	14,740	3.1%	\$60	\$1,095	3.4%	\$163	\$1,843	3.5%
AZ-6	3,000	16,340	3.9%	\$254	\$1,308	4.5%	\$422	\$2,020	4.4%
AZ-7	2,940	15,340	3.7%	\$274	\$1,223	4.1%	\$566	\$1,994	4.2%
AZ-8	2,050	14,440	3.4%	\$112	\$963	3.6%	\$249	\$1,580	3.5%
AZ-9	4,050	17,210	4.0%	\$251	\$1,281	4.2%	\$614	\$2,234	4.7%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-4. Economic Impact of the Oil and Natural Gas Industry in Arkansas, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Arkansas	24,610	92,000	5.5%	\$1,078	\$5,071	5.6%	\$3,897	\$10,569	7.1%
AR-1	5,100	17,850	4.4%	\$190	\$818	4.3%	\$597	\$1,783	5.4%
AR-2	7,750	29,560	6.8%	\$338	\$1,803	7.0%	\$1,159	\$3,500	8.5%
AR-3	3,930	21,540	4.8%	\$196	\$1,329	4.8%	\$854	\$2,739	6.3%
AR-4	7,830	23,050	5.9%	\$353	\$1,122	6.1%	\$1,287	\$2,547	8.2%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-5. Economic Impact of the Oil and Natural Gas Industry in California, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
California	159,550	1,035,260	4.3%	\$23,333	\$104,870	5.0%	\$90,383	\$217,129	6.4%
CA-1	3,230	17,050	4.1%	\$221	\$1,046	3.9%	\$966	\$2,162	5.1%
CA-2	1,980	20,520	3.9%	\$263	\$1,847	4.4%	\$868	\$3,685	5.6%
CA-3	2,510	17,900	4.1%	\$190	\$1,343	4.1%	\$748	\$2,396	4.4%
CA-4	2,120	18,770	3.7%	\$179	\$1,267	3.7%	\$839	\$2,405	4.5%
CA-5	2,310	17,600	3.8%	\$228	\$1,392	3.9%	\$774	\$2,636	4.5%
CA-6	1,540	16,700	3.6%	\$142	\$1,304	3.5%	\$583	\$2,203	4.0%
CA-7	1,660	16,050	3.6%	\$178	\$1,334	3.6%	\$844	\$2,332	4.3%
CA-8	4,790	28,180	6.3%	\$705	\$2,290	7.6%	\$4,382	\$6,589	13.3%
CA-9	1,680	15,770	3.8%	\$151	\$1,110	3.8%	\$874	\$2,188	4.8%
CA-10	2,070	23,310	5.0%	\$266	\$1,791	5.6%	\$10,884	\$13,662	27.5%
CA-11	840	24,710	4.2%	\$138	\$2,626	5.0%	\$250	\$4,691	5.4%
CA-12	1,010	21,470	4.4%	\$234	\$4,829	5.1%	\$338	\$8,584	6.1%
CA-13	2,570	14,910	3.8%	\$276	\$1,393	3.7%	\$1,329	\$2,791	4.9%
CA-14	1,440	19,690	3.9%	\$284	\$3,880	4.4%	\$590	\$6,686	4.1%
CA-15	1,080	19,430	4.0%	\$151	\$2,234	4.4%	\$549	\$3,582	4.5%
CA-16	1,190	16,970	3.8%	\$83	\$1,227	4.1%	\$400	\$2,063	4.5%
CA-17	1,240	19,890	4.1%	\$203	\$5,546	5.3%	\$1,300	\$8,176	4.9%
CA-18	1,600	17,660	3.9%	\$281	\$3,229	4.2%	\$972	\$4,899	4.1%
CA-19	1,830	18,500	3.9%	\$308	\$2,636	4.5%	\$856	\$4,048	4.3%
CA-20	16,560	36,270	8.9%	\$1,342	\$2,890	9.3%	\$7,659	\$9,935	20.7%
CA-21	1,620	13,070	3.8%	\$169	\$937	3.8%	\$748	\$1,820	4.5%
CA-22	7,960	22,350	6.4%	\$663	\$1,550	6.7%	\$2,974	\$4,172	11.8%
CA-23	3,870	16,520	4.7%	\$527	\$1,378	5.5%	\$1,305	\$2,475	6.0%
CA-24	4,450	25,240	5.5%	\$675	\$2,260	6.8%	\$2,430	\$4,726	9.2%
CA-25	2,720	15,300	4.1%	\$387	\$1,315	4.5%	\$1,298	\$2,720	5.8%
CA-26	3,620	22,350	4.7%	\$541	\$2,014	5.6%	\$1,971	\$4,289	7.3%
CA-27	2,200	16,580	3.8%	\$274	\$1,487	4.2%	\$832	\$2,722	5.0%
CA-28	3,460	20,540	4.3%	\$773	\$2,412	5.7%	\$2,177	\$4,843	7.1%
CA-29	1,190	16,720	3.6%	\$167	\$1,475	3.9%	\$700	\$2,847	4.6%
CA-30	1,840	22,240	4.0%	\$359	\$2,415	5.0%	\$937	\$4,608	5.8%
CA-31	2,170	18,430	4.2%	\$232	\$1,248	4.4%	\$990	\$2,558	5.7%
CA-32	3,490	21,120	4.3%	\$604	\$2,184	5.7%	\$1,665	\$4,293	6.8%
CA-33	2,690	20,390	4.0%	\$546	\$2,188	4.7%	\$1,256	\$3,970	5.2%
CA-34	6,370	25,730	4.9%	\$1,432	\$3,173	7.3%	\$2,724	\$5,566	8.0%

(Continued on next page)

Table C-5. Economic Impact of the Oil and Natural Gas Industry in California, 2021, continued

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
CA-35	3,290	20,260	4.4%	\$381	\$1,523	4.8%	\$2,761	\$4,387	8.8%
CA-36	4,090	24,540	4.9%	\$533	\$1,829	6.3%	\$2,607	\$4,754	10.5%
CA-37	1,470	19,950	3.9%	\$256	\$2,089	4.5%	\$798	\$3,719	4.9%
CA-38	4,320	19,370	4.4%	\$878	\$2,046	6.1%	\$2,627	\$4,416	8.1%
CA-39	1,810	17,920	3.9%	\$355	\$1,616	4.4%	\$1,348	\$3,347	5.6%
CA-40	4,340	21,080	4.5%	\$623	\$2,037	5.5%	\$2,597	\$4,884	8.0%
CA-41	2,970	18,380	4.3%	\$303	\$1,219	4.6%	\$1,342	\$2,571	6.4%
CA-42	3,200	21,010	4.5%	\$339	\$1,448	4.9%	\$1,778	\$3,315	7.2%
CA-43	3,440	19,430	4.4%	\$757	\$2,099	5.6%	\$2,084	\$3,939	6.8%
CA-44	7,980	24,120	5.4%	\$1,631	\$2,941	8.0%	\$4,111	\$6,098	9.4%
CA-45	1,740	17,950	3.8%	\$318	\$1,767	4.2%	\$706	\$3,600	5.3%
CA-46	3,030	19,830	4.2%	\$737	\$2,109	5.5%	\$1,897	\$4,367	7.1%
CA-47	3,140	20,050	4.1%	\$487	\$1,935	4.9%	\$1,179	\$3,598	5.7%
CA-48	3,010	18,860	4.3%	\$771	\$2,112	5.8%	\$1,485	\$3,836	6.6%
CA-49	2,220	17,910	3.8%	\$358	\$1,768	4.1%	\$884	\$3,204	4.4%
CA-50	3,520	20,710	4.4%	\$630	\$2,000	5.6%	\$1,387	\$3,464	5.6%
CA-51	3,820	20,520	4.5%	\$652	\$1,928	5.7%	\$2,156	\$4,033	7.0%
CA-52	1,210	15,400	3.6%	\$150	\$1,157	3.5%	\$623	\$2,273	4.1%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-6. Economic Impact of the Oil and Natural Gas Industry in Colorado, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Colorado	54,420	303,730	7.7%	\$15,360	\$34,056	12.0%	\$19,848	\$48,726	11.2%
CO-1	14,540	54,800	10.4%	\$9,114	\$13,636	25.3%	\$9,620	\$15,454	19.7%
CO-2	2,940	33,140	6.2%	\$250	\$2,486	6.3%	\$478	\$3,550	5.8%
CO-3	12,070	46,810	10.1%	\$1,676	\$3,566	14.2%	\$2,311	\$5,611	14.1%
CO-4	6,580	39,310	7.3%	\$1,123	\$3,315	9.2%	\$1,937	\$6,535	11.5%
CO-5	2,130	27,370	6.4%	\$520	\$2,153	7.7%	\$637	\$2,741	6.7%
CO-6	3,230	32,850	6.7%	\$903	\$3,288	8.5%	\$1,264	\$6,001	9.9%
CO-7	3,300	30,810	6.4%	\$677	\$2,765	7.8%	\$1,149	\$4,006	7.2%
CO-8	9,620	38,640	8.1%	\$1,098	\$2,847	10.3%	\$2,452	\$4,828	11.3%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-7. Economic Impact of the Oil and Natural Gas Industry in Connecticut, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Connecticut	14,310	78,930	3.5%	\$2,234	\$8,198	4.4%	\$4,188	\$13,614	4.6%
CT-1	2,800	15,360	3.7%	\$546	\$1,714	5.0%	\$1,126	\$2,990	5.2%
CT-2	2,930	15,100	3.4%	\$260	\$1,159	3.8%	\$496	\$2,032	3.8%
CT-3	2,880	15,070	3.3%	\$576	\$1,508	4.6%	\$981	\$2,294	4.3%
CT-4	3,200	18,860	3.6%	\$626	\$2,592	4.8%	\$1,139	\$4,297	5.4%
CT-5	2,490	14,550	3.2%	\$227	\$1,225	3.7%	\$445	\$2,001	3.7%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-8. Economic Impact of the Oil and Natural Gas Industry in Delaware, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Delaware	5,890	27,680	4.5%	\$466	\$2,019	4.9%	\$981	\$4,071	5.0%
DE-1 (At-Large)	5,890	27,680	4.5%	\$466	\$2,019	4.9%	\$981	\$4,071	5.0%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-9. Economic Impact of the Oil and Natural Gas Industry in the District of Columbia, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
District of Columbia	2,450	20,100	2.3%	\$464	\$2,886	2.6%	\$1,135	\$4,540	3.0%
DC-1 (At-Large)	2,450	20,100	2.3%	\$464	\$2,886	2.6%	\$1,135	\$4,539	3.0%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-10. Economic Impact of the Oil and Natural Gas Industry in Florida, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Florida	69,340	433,400	3.3%	\$3,550	\$27,533	3.6%	\$14,893	\$53,136	4.2%
FL-1	6,320	28,170	6.7%	\$92	\$1,273	7.1%	\$82	\$2,092	6.5%
FL-2	3,780	14,760	3.3%	\$137	\$618	3.5%	\$346	\$1,116	3.5%
FL-3	3,470	14,600	3.6%	\$137	\$629	3.8%	\$599	\$1,354	4.4%
FL-4	2,870	15,090	3.5%	\$135	\$814	3.8%	\$512	\$1,766	4.6%
FL-5	2,780	15,590	3.4%	\$240	\$1,188	4.0%	\$610	\$2,146	4.6%
FL-6	2,350	13,320	3.1%	\$100	\$695	3.3%	\$248	\$1,233	3.5%
FL-7	2,130	14,810	3.2%	\$105	\$1,044	3.4%	\$200	\$1,516	3.1%
FL-8	2,500	13,610	3.2%	\$184	\$935	3.5%	\$713	\$1,917	4.6%
FL-9	2,290	15,060	3.1%	\$108	\$825	3.1%	\$461	\$1,498	3.4%
FL-10	2,430	15,880	3.5%	\$135	\$1,048	3.6%	\$542	\$1,769	3.9%
FL-11	2,120	13,310	3.1%	\$84	\$691	3.3%	\$172	\$1,180	3.3%
FL-12	1,570	11,640	2.8%	\$69	\$680	3.1%	\$146	\$1,035	2.7%
FL-13	1,960	14,520	3.3%	\$87	\$1,011	3.6%	\$316	\$1,604	3.5%
FL-14	2,770	17,510	3.5%	\$266	\$1,485	4.2%	\$1,297	\$3,099	5.4%
FL-15	2,310	14,590	3.2%	\$149	\$993	3.6%	\$521	\$1,724	3.7%
FL-16	1,670	14,530	3.1%	\$91	\$935	3.4%	\$331	\$2,053	4.5%
FL-17	1,530	11,990	2.9%	\$65	\$680	3.1%	\$154	\$1,142	3.1%
FL-18	4,050	17,390	3.9%	\$176	\$1,026	4.0%	\$1,245	\$2,542	6.1%
FL-19	2,360	15,100	3.4%	\$118	\$949	3.7%	\$321	\$1,733	4.2%
FL-20	1,830	13,980	2.9%	\$126	\$1,030	3.3%	\$512	\$1,805	3.5%
FL-21	1,960	14,900	3.1%	\$120	\$1,052	3.4%	\$537	\$1,993	3.9%
FL-22	1,560	15,330	3.0%	\$128	\$1,186	3.5%	\$399	\$1,884	3.6%
FL-23	1,620	15,950	2.9%	\$107	\$1,131	3.4%	\$668	\$2,186	4.0%
FL-24	1,650	15,000	2.9%	\$145	\$1,048	3.4%	\$826	\$2,358	4.7%
FL-25	1,690	15,750	2.8%	\$125	\$1,212	3.4%	\$503	\$2,427	4.2%
FL-26	4,990	18,250	3.6%	\$194	\$1,171	3.7%	\$2,104	\$3,817	7.3%
FL-27	1,480	17,990	3.0%	\$70	\$1,388	3.5%	\$314	\$2,678	4.5%
FL-28	1,310	14,800	2.6%	\$56	\$796	3.0%	\$214	\$1,472	3.4%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-11. Economic Impact of the Oil and Natural Gas Industry in Georgia, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Georgia	45,180	234,170	3.6%	\$2,589	\$15,939	3.9%	\$10,798	\$32,915	4.8%
GA-1	4,070	16,120	4.1%	\$203	\$915	3.9%	\$773	\$1,821	4.8%
GA-2	4,080	14,490	3.9%	\$138	\$745	3.5%	\$719	\$1,603	4.7%
GA-3	3,420	16,110	3.5%	\$170	\$840	3.7%	\$622	\$1,628	4.1%
GA-4	2,550	16,750	3.2%	\$153	\$1,084	3.6%	\$659	\$3,621	6.8%
GA-5	3,720	20,460	4.1%	\$463	\$2,281	4.8%	\$1,649	\$4,648	5.9%
GA-6	2,320	20,160	3.7%	\$258	\$2,137	4.4%	\$616	\$3,407	4.5%
GA-7	2,750	17,590	3.4%	\$221	\$1,368	3.9%	\$890	\$2,680	4.6%
GA-8	4,360	15,370	4.0%	\$129	\$714	3.6%	\$464	\$1,333	4.0%
GA-9	3,320	16,780	3.6%	\$175	\$908	3.7%	\$1,471	\$2,604	6.3%
GA-10	2,870	15,800	3.1%	\$103	\$784	3.2%	\$421	\$1,693	3.9%
GA-11	2,390	18,430	3.4%	\$165	\$1,504	3.8%	\$598	\$2,587	4.0%
GA-12	3,930	15,320	3.9%	\$125	\$780	3.5%	\$391	\$1,313	3.6%
GA-13	2,670	15,940	3.3%	\$170	\$1,092	3.6%	\$937	\$2,303	4.3%
GA-14	2,740	14,850	3.2%	\$115	\$787	3.3%	\$590	\$1,675	4.1%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-12. Economic Impact of the Oil and Natural Gas Industry in Hawaii, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Hawaii	4,120	25,370	3.0%	\$319	\$1,798	3.1%	\$1,525	\$3,944	4.3%
HI-1	1,500	12,460	2.9%	\$153	\$987	3.2%	\$668	\$2,004	4.2%
HI-2	2,620	12,910	3.0%	\$167	\$810	3.0%	\$857	\$1,940	4.5%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-13. Economic Impact of the Oil and Natural Gas Industry in Idaho, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Idaho	10,400	43,240	3.8%	\$732	\$2,716	4.3%	\$1,622	\$4,739	4.9%
ID-1	4,170	20,070	3.5%	\$289	\$1,195	3.9%	\$618	\$2,094	4.3%
ID-2	6,230	23,180	4.2%	\$441	\$1,519	4.6%	\$994	\$2,635	5.5%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-14. Economic Impact of the Oil and Natural Gas Industry in Illinois, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Illinois	59,480	343,260	4.5%	\$6,428	\$30,401	5.2%	\$17,672	\$55,310	5.8%
IL-1	2,160	15,230	3.7%	\$160	\$1,168	3.9%	\$446	\$1,905	3.9%
IL-2	2,760	14,900	3.8%	\$171	\$1,101	3.9%	\$535	\$1,877	4.0%
IL-3	1,740	17,820	3.8%	\$207	\$1,530	4.3%	\$680	\$2,580	4.5%
IL-4	2,140	15,900	3.9%	\$518	\$1,691	5.2%	\$1,399	\$3,127	5.9%
IL-5	1,030	21,740	4.0%	\$110	\$2,131	4.8%	\$323	\$3,204	4.6%
IL-6	2,190	18,890	4.1%	\$438	\$1,925	5.1%	\$1,258	\$3,377	5.8%
IL-7	3,360	23,940	4.9%	\$964	\$3,504	7.0%	\$2,353	\$5,736	7.7%
IL-8	1,620	18,320	3.9%	\$195	\$1,798	4.4%	\$725	\$3,074	4.6%
IL-9	1,010	18,020	3.8%	\$102	\$1,669	4.2%	\$224	\$2,475	4.0%
IL-10	1,460	18,190	3.9%	\$116	\$1,886	4.2%	\$459	\$3,276	4.2%
IL-11	2,520	19,790	4.2%	\$418	\$1,786	5.2%	\$905	\$2,955	5.3%
IL-12	14,160	39,570	9.7%	\$990	\$2,888	11.6%	\$4,473	\$7,619	19.1%
IL-13	3,950	19,060	4.6%	\$541	\$1,540	5.8%	\$831	\$3,739	8.7%
IL-14	4,410	22,040	4.6%	\$607	\$1,948	5.6%	\$1,047	\$3,022	5.4%
IL-15	6,150	21,030	4.6%	\$259	\$1,192	4.5%	\$569	\$3,015	7.0%
IL-16	6,160	22,650	5.1%	\$512	\$1,599	5.7%	\$909	\$2,500	5.4%
IL-17	2,660	16,180	3.9%	\$118	\$1,046	3.9%	\$538	\$1,828	3.9%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-15 Economic Impact of the Oil and Natural Gas Industry in Indiana, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Indiana	37,340	180,440	4.6%	\$2,509	\$12,345	4.8%	\$8,511	\$24,210	5.9%
IN-1	5,750	26,790	6.5%	\$699	\$2,048	8.1%	\$2,343	\$4,377	10.1%
IN-2	3,210	16,130	3.9%	\$153	\$1,067	3.9%	\$592	\$2,112	5.1%
IN-3	3,650	17,940	4.1%	\$175	\$1,102	4.1%	\$618	\$2,136	5.0%
IN-4	3,940	18,330	4.0%	\$204	\$1,079	4.1%	\$519	\$1,912	4.4%
IN-5	2,480	18,120	3.9%	\$135	\$1,393	4.1%	\$442	\$2,483	4.7%
IN-6	3,210	17,670	3.9%	\$148	\$1,025	4.0%	\$405	\$1,773	4.2%
IN-7	2,670	17,580	4.1%	\$317	\$1,774	4.4%	\$712	\$3,257	5.1%
IN-8	9,120	30,450	7.2%	\$497	\$1,854	7.2%	\$2,312	\$4,372	10.1%
IN-9	3,320	17,420	3.9%	\$180	\$1,005	4.0%	\$570	\$1,788	4.4%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-16. Economic Impact of the Oil and Natural Gas Industry in Iowa, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Iowa	28,010	92,660	4.5%	\$1,097	\$5,152	4.2%	\$3,019	\$10,243	4.7%
IA-1	5,930	20,820	4.1%	\$215	\$1,123	3.8%	\$505	\$2,143	4.1%
IA-2	7,410	23,370	4.7%	\$293	\$1,251	4.4%	\$993	\$2,706	5.4%
IA-3	6,000	23,330	4.5%	\$244	\$1,454	4.2%	\$671	\$2,697	4.2%
IA-4	8,670	25,140	4.8%	\$345	\$1,324	4.5%	\$851	\$2,697	5.3%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-17. Economic Impact of the Oil and Natural Gas Industry in Kansas, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Kansas	46,160	160,760	8.4%	\$2,586	\$10,614	9.0%	\$6,917	\$19,327	10.1%
KS-1	17,420	45,640	9.1%	\$688	\$2,356	8.8%	\$2,102	\$4,601	10.6%
KS-2	9,230	34,290	7.8%	\$375	\$1,902	7.9%	\$1,221	\$3,426	8.8%
KS-3	4,400	35,040	6.8%	\$539	\$3,264	8.2%	\$1,385	\$5,926	9.3%
KS-4	15,110	45,790	10.0%	\$983	\$3,092	11.4%	\$2,208	\$5,374	11.9%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-18. Economic Impact of the Oil and Natural Gas Industry in Kentucky, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Kentucky	28,280	116,940	4.6%	\$1,376	\$6,920	4.7%	\$6,000	\$14,777	6.2%
KY-1	5,140	17,900	4.4%	\$204	\$960	4.3%	\$666	\$1,820	5.4%
KY-2	4,780	18,650	4.2%	\$210	\$1,035	4.3%	\$759	\$2,140	5.4%
KY-3	2,670	17,070	3.8%	\$177	\$1,307	4.1%	\$782	\$2,715	5.2%
KY-4	3,720	18,570	4.0%	\$173	\$1,180	4.3%	\$668	\$2,300	5.1%
KY-5	8,120	24,790	7.6%	\$421	\$1,248	8.3%	\$1,978	\$3,169	13.1%
KY-6	3,870	19,960	4.3%	\$192	\$1,190	4.5%	\$1,149	\$2,632	6.1%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-19. Economic Impact of the Oil and Natural Gas Industry in Louisiana, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Louisiana	91,720	346,710	13.1%	\$10,748	\$25,763	16.7%	\$29,165	\$54,260	21.0%
LA-1	16,100	62,590	12.6%	\$3,083	\$6,012	19.3%	\$7,529	\$12,218	24.8%
LA-2	10,230	48,930	11.6%	\$1,351	\$3,918	14.2%	\$5,100	\$9,767	19.8%
LA-3	27,140	84,080	18.6%	\$2,613	\$5,853	22.9%	\$6,777	\$11,963	26.7%
LA-4	13,970	51,850	13.5%	\$1,214	\$3,291	15.8%	\$3,233	\$6,448	18.9%
LA-5	9,080	39,900	10.1%	\$874	\$2,456	12.2%	\$2,417	\$5,077	15.4%
LA-6	15,200	59,370	12.2%	\$1,612	\$4,233	14.7%	\$4,108	\$8,788	18.3%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-20. Economic Impact of the Oil and Natural Gas Industry in Maine, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Maine	11,340	37,530	4.5%	\$604	\$2,236	4.5%	\$1,739	\$4,445	5.7%
ME-1	4,760	19,010	4.2%	\$313	\$1,285	4.5%	\$1,012	\$2,667	6.0%
ME-2	6,580	18,520	4.7%	\$291	\$951	4.5%	\$728	\$1,778	5.3%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-21. Economic Impact of the Oil and Natural Gas Industry in Maryland, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Maryland	18,030	106,630	2.9%	\$1,153	\$8,074	2.9%	\$4,950	\$15,927	3.6%
MD-1	3,240	14,760	3.2%	\$145	\$810	3.1%	\$747	\$1,819	4.3%
MD-2	2,280	13,250	3.0%	\$118	\$1,001	2.9%	\$481	\$1,850	3.3%
MD-3	1,850	12,790	2.8%	\$118	\$1,086	2.9%	\$500	\$1,934	3.3%
MD-4	1,870	12,430	2.7%	\$128	\$879	2.7%	\$416	\$1,515	2.8%
MD-5	1,950	12,520	2.5%	\$111	\$833	2.5%	\$367	\$1,468	2.6%
MD-6	3,360	14,900	3.2%	\$217	\$1,175	3.2%	\$967	\$2,532	4.3%
MD-7	2,510	12,750	3.1%	\$254	\$1,072	3.4%	\$1,267	\$2,513	5.2%
MD-8	970	13,230	2.5%	\$63	\$1,217	2.8%	\$204	\$2,298	3.3%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-22. Economic Impact of the Oil and Natural Gas Industry in Massachusetts, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Massachusetts	24,880	151,680	3.2%	\$2,707	\$15,361	3.6%	\$6,663	\$25,721	4.0%
MA-1	3,920	16,800	3.8%	\$239	\$1,092	3.8%	\$593	\$1,869	4.3%
MA-2	3,270	17,030	3.3%	\$232	\$1,221	3.4%	\$706	\$2,265	4.1%
MA-3	2,020	15,210	3.0%	\$194	\$1,550	3.5%	\$411	\$2,290	3.3%
MA-4	2,690	17,400	3.2%	\$281	\$1,634	3.8%	\$648	\$2,631	4.1%
MA-5	2,540	16,330	3.0%	\$398	\$1,974	3.4%	\$1,464	\$3,797	4.4%
MA-6	2,330	17,040	3.1%	\$152	\$1,637	3.3%	\$319	\$2,540	3.3%
MA-7	1,310	14,580	2.8%	\$170	\$1,953	3.1%	\$387	\$2,908	3.1%
MA-8	3,380	19,040	3.4%	\$679	\$2,841	4.5%	\$1,335	\$4,778	5.1%
MA-9	3,420	18,260	3.2%	\$362	\$1,460	3.9%	\$800	\$2,642	4.5%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-23. Economic Impact of the Oil and Natural Gas Industry in Michigan, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Michigan	45,640	228,570	4.1%	\$3,395	\$16,370	4.5%	\$9,619	\$29,873	5.2%
MI-1	8,910	25,060	6.0%	\$388	\$1,279	5.9%	\$566	\$1,971	5.6%
MI-2	5,770	18,790	4.9%	\$327	\$1,175	5.0%	\$812	\$2,130	5.8%
MI-3	3,500	18,830	4.2%	\$251	\$1,353	4.7%	\$611	\$2,283	5.1%
MI-4	2,620	16,440	3.6%	\$129	\$978	3.9%	\$334	\$1,598	4.0%
MI-5	4,010	16,970	4.1%	\$306	\$1,108	4.6%	\$585	\$1,801	4.6%
MI-6	3,050	18,010	3.9%	\$293	\$1,297	4.5%	\$740	\$2,324	4.8%
MI-7	3,140	17,330	3.8%	\$159	\$1,146	3.9%	\$422	\$1,969	4.1%
MI-8	2,560	14,760	3.7%	\$145	\$1,005	3.9%	\$405	\$1,705	4.1%
MI-9	3,260	17,030	3.8%	\$114	\$1,205	3.7%	\$410	\$2,236	4.5%
MI-10	1,350	15,740	3.3%	\$75	\$1,022	3.6%	\$218	\$1,776	3.9%
MI-11	1,700	18,320	3.8%	\$287	\$1,780	4.8%	\$549	\$3,073	5.5%
MI-12	2,470	14,850	4.0%	\$374	\$1,344	5.0%	\$778	\$2,210	5.2%
MI-13	3,310	16,430	4.5%	\$547	\$1,677	5.9%	\$3,188	\$4,795	10.7%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-24. Economic Impact of the Oil and Natural Gas Industry in Minnesota, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Minnesota	38,870	170,350	4.6%	\$2,578	\$12,959	5.0%	\$8,691	\$24,622	6.0%
MN-1	5,800	20,560	4.4%	\$221	\$1,233	4.1%	\$444	\$1,961	4.3%
MN-2	5,000	28,310	5.8%	\$646	\$2,444	7.2%	\$3,878	\$6,958	12.1%
MN-3	5,190	22,380	4.9%	\$485	\$2,306	5.5%	\$911	\$3,474	5.3%
MN-4	1,990	16,490	3.8%	\$93	\$1,256	3.9%	\$405	\$2,131	4.3%
MN-5	2,760	19,970	4.2%	\$255	\$1,996	4.6%	\$896	\$3,252	4.9%
MN-6	4,330	20,040	4.1%	\$272	\$1,347	4.5%	\$625	\$2,453	5.1%
MN-7	6,750	21,310	4.6%	\$245	\$1,183	4.4%	\$703	\$2,187	5.2%
MN-8	7,050	21,290	5.1%	\$360	\$1,194	5.1%	\$828	\$2,206	5.7%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-25. Economic Impact of the Oil and Natural Gas Industry in Mississippi, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Mississippi	30,710	109,120	6.8%	\$1,996	\$5,922	7.5%	\$7,920	\$14,428	11.3%
MS-1	4,570	22,440	5.2%	\$261	\$1,130	5.6%	\$794	\$2,281	7.1%
MS-2	8,380	24,530	6.9%	\$464	\$1,275	7.2%	\$1,535	\$2,934	10.0%
MS-3	10,290	29,180	6.9%	\$627	\$1,565	7.6%	\$1,612	\$3,072	9.3%
MS-4	7,470	32,960	8.2%	\$644	\$1,953	9.6%	\$3,979	\$6,142	18.6%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-26. Economic Impact of the Oil and Natural Gas Industry in Missouri, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Missouri	41,510	169,520	4.5%	\$2,326	\$10,826	4.7%	\$6,109	\$19,740	5.5%
MO-1	6,290	23,960	5.5%	\$607	\$2,115	6.0%	\$1,631	\$4,108	7.5%
MO-2	3,610	19,880	4.1%	\$242	\$1,536	4.3%	\$646	\$3,035	5.5%
MO-3	3,960	19,060	3.8%	\$186	\$1,044	3.8%	\$544	\$2,005	4.5%
MO-4	5,430	19,480	4.1%	\$230	\$980	4.0%	\$484	\$1,603	4.3%
MO-5	5,630	26,510	5.6%	\$302	\$2,006	5.8%	\$721	\$3,163	5.9%
MO-6	5,880	20,320	4.2%	\$276	\$1,131	4.2%	\$697	\$2,085	4.8%
MO-7	4,870	20,480	4.5%	\$243	\$1,112	4.5%	\$721	\$1,997	5.3%
MO-8	5,840	19,840	4.3%	\$240	\$901	4.3%	\$665	\$1,745	5.2%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-27. Economic Impact of the Oil and Natural Gas Industry in Montana, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Montana	13,740	56,910	8.0%	\$1,226	\$3,730	9.8%	\$3,674	\$7,476	12.7%
MT-1	3,760	18,960	5.2%	\$296	\$1,288	5.9%	\$571	\$2,084	6.3%
MT-2	9,980	37,950	11.0%	\$930	\$2,442	15.2%	\$3,103	\$5,392	21.3%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-28. Economic Impact of the Oil and Natural Gas Industry in Nebraska, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Nebraska	14,230	62,650	4.7%	\$1,967	\$5,138	6.2%	\$4,480	\$9,851	6.7%
NE-1	3,170	18,450	4.0%	\$178	\$1,116	4.1%	\$482	\$1,994	4.2%
NE-2	3,370	20,360	4.9%	\$1,104	\$2,391	7.7%	\$2,516	\$4,591	8.5%
NE-3	7,700	23,850	5.3%	\$686	\$1,630	6.5%	\$1,482	\$3,266	7.4%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-29. Economic Impact of the Oil and Natural Gas Industry in Nevada, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Nevada	14,400	71,120	3.8%	\$1,121	\$4,947	4.2%	\$3,662	\$10,063	5.2%
NV-1	3,290	17,280	3.9%	\$265	\$1,154	4.4%	\$954	\$2,410	5.7%
NV-2	3,990	19,900	4.1%	\$369	\$1,554	4.8%	\$1,179	\$3,127	5.8%
NV-3	3,330	19,030	3.6%	\$255	\$1,279	4.0%	\$660	\$2,450	4.6%
NV-4	3,790	14,900	3.6%	\$232	\$960	3.7%	\$869	\$2,075	4.6%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-30. Economic Impact of the Oil and Natural Gas Industry in New Hampshire, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
New Hampshire	8,380	33,680	3.8%	\$559	\$2,795	4.1%	\$1,242	\$4,544	4.6%
NH-1	3,860	17,340	3.7%	\$297	\$1,522	4.2%	\$721	\$2,576	4.8%
NH-2	4,510	16,330	3.9%	\$262	\$1,273	4.0%	\$521	\$1,968	4.3%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-31. Economic Impact of the Oil and Natural Gas Industry in New Jersey, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
New Jersey	36,910	213,680	3.9%	\$4,567	\$18,587	4.2%	\$17,456	\$37,974	5.6%
NJ-1	3,220	18,840	4.4%	\$327	\$1,363	4.7%	\$2,248	\$3,670	8.0%
NJ-2	4,640	19,400	4.7%	\$446	\$1,300	5.1%	\$1,634	\$2,844	7.1%
NJ-3	3,870	18,630	4.0%	\$288	\$1,279	4.0%	\$2,175	\$3,558	7.0%
NJ-4	3,850	17,410	3.9%	\$401	\$1,277	4.3%	\$869	\$2,116	4.5%
NJ-5	2,560	18,060	3.5%	\$218	\$1,455	3.6%	\$673	\$2,604	4.3%
NJ-6	3,040	18,090	3.9%	\$317	\$1,538	4.2%	\$1,693	\$3,442	6.0%
NJ-7	4,420	20,410	4.1%	\$510	\$2,058	4.3%	\$2,745	\$5,012	6.9%
NJ-8	1,880	17,250	3.6%	\$298	\$1,712	4.0%	\$1,219	\$3,347	5.2%
NJ-9	2,500	17,140	3.6%	\$258	\$1,416	3.8%	\$1,753	\$3,645	6.2%
NJ-10	2,230	14,840	3.5%	\$371	\$1,361	3.9%	\$2,417	\$3,859	6.7%
NJ-11	2,060	16,940	3.5%	\$191	\$1,604	3.6%	\$555	\$2,632	3.9%
NJ-12	2,650	16,650	3.8%	\$943	\$2,223	5.6%	-\$525	\$1,245	2.0%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-32. Economic Impact of the Oil and Natural Gas Industry in New Mexico, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
New Mexico	35,610	92,510	8.5%	\$2,819	\$6,038	9.6%	\$11,093	\$16,644	15.2%
NM-1	3,970	22,440	5.7%	\$254	\$1,398	5.8%	\$1,108	\$2,973	7.7%
NM-2	13,880	30,530	8.9%	\$1,092	\$2,028	10.5%	\$4,341	\$6,133	16.8%
NM-3	17,760	39,540	11.2%	\$1,473	\$2,613	13.5%	\$5,644	\$7,539	22.0%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-33. Economic Impact of the Oil and Natural Gas Industry in New York, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
New York	54,240	347,290	2.8%	\$6,087	\$38,287	3.4%	\$15,735	\$70,142	3.7%
NY-1	2,070	13,040	2.6%	\$247	\$1,430	3.2%	\$613	\$2,596	3.5%
NY-2	2,000	13,070	2.5%	\$201	\$1,330	2.8%	\$878	\$2,727	3.4%
NY-3	2,140	14,600	2.8%	\$179	\$1,515	3.2%	\$560	\$3,289	4.1%
NY-4	1,780	13,690	2.5%	\$171	\$1,306	2.8%	\$600	\$2,817	3.6%
NY-5	390	9,850	2.1%	\$24	\$802	2.1%	\$60	\$1,230	2.0%
NY-6	600	10,880	2.3%	\$48	\$824	2.4%	\$119	\$1,479	2.7%
NY-7	1,780	15,280	2.9%	\$349	\$2,464	4.2%	\$860	\$4,348	4.2%
NY-8	620	10,650	2.2%	\$68	\$848	2.6%	\$213	\$1,511	2.6%
NY-9	590	10,010	2.2%	\$60	\$780	2.4%	\$125	\$1,238	2.3%
NY-10	1,480	16,170	3.5%	\$766	\$4,482	5.4%	\$2,054	\$8,644	5.7%
NY-11	810	10,800	2.4%	\$73	\$839	2.5%	\$301	\$1,439	2.7%
NY-12	520	17,010	3.4%	\$144	\$4,880	5.1%	\$686	\$8,889	5.1%
NY-13	220	8,820	2.3%	\$15	\$1,039	2.3%	\$36	\$1,581	1.8%
NY-14	540	9,650	2.2%	\$43	\$760	2.3%	\$220	\$1,398	2.6%
NY-15	500	8,600	2.1%	\$40	\$669	2.1%	\$233	\$1,128	2.3%
NY-16	1,410	12,750	2.5%	\$104	\$1,230	2.7%	\$524	\$3,098	4.2%
NY-17	1,940	14,030	2.8%	\$186	\$1,543	3.0%	\$523	\$3,186	3.8%
NY-18	3,250	14,060	2.9%	\$269	\$1,149	2.9%	\$662	\$2,118	3.2%
NY-19	4,050	14,710	3.0%	\$341	\$1,064	3.1%	\$843	\$1,999	3.4%
NY-20	2,610	13,310	2.9%	\$160	\$1,173	2.7%	\$616	\$2,081	2.9%
NY-21	4,590	14,510	3.4%	\$253	\$959	3.0%	\$678	\$1,702	3.2%
NY-22	2,530	12,350	2.9%	\$130	\$838	2.7%	\$443	\$1,487	2.8%
NY-23	7,190	25,770	5.9%	\$1,011	\$2,508	7.9%	-\$1,705	\$290	0.6%
NY-24	3,960	15,050	3.5%	\$267	\$1,138	3.2%	\$933	\$2,369	3.9%
NY-25	2,250	13,290	2.9%	\$161	\$1,063	2.9%	\$975	\$2,219	3.7%
NY-26	4,430	15,340	3.5%	\$777	\$1,651	4.9%	\$3,681	\$5,278	9.2%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-34. Economic Impact of the Oil and Natural Gas Industry in North Carolina, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
North Carolina	46,370	224,160	3.6%	\$2,930	\$15,129	3.8%	\$8,029	\$28,809	4.4%
NC-1	4,000	14,880	3.7%	\$239	\$1,040	3.7%	\$617	\$1,888	4.0%
NC-2	1,920	16,880	3.2%	\$120	\$1,229	3.8%	\$531	\$2,424	4.2%
NC-3	3,850	14,050	3.7%	\$205	\$771	3.6%	\$479	\$1,370	4.2%
NC-4	2,290	14,620	3.1%	\$187	\$1,269	3.4%	\$389	\$2,107	3.4%
NC-5	2,870	14,280	3.4%	\$168	\$876	3.5%	\$409	\$1,802	4.1%
NC-6	6,140	20,580	4.4%	\$260	\$1,211	4.5%	\$638	\$2,272	4.9%
NC-7	3,190	15,130	3.4%	\$180	\$860	3.5%	\$429	\$1,585	3.8%
NC-8	3,740	16,230	3.8%	\$254	\$1,126	4.0%	\$731	\$2,090	4.8%
NC-9	2,990	13,320	3.5%	\$218	\$948	3.7%	\$480	\$1,580	4.0%
NC-10	3,280	16,030	3.6%	\$192	\$930	3.8%	\$521	\$1,747	4.4%
NC-11	3,260	15,180	3.4%	\$171	\$790	3.5%	\$440	\$1,491	4.1%
NC-12	2,770	17,160	3.6%	\$301	\$1,726	4.0%	\$553	\$3,168	4.4%
NC-13	2,940	16,220	3.4%	\$174	\$1,057	3.7%	\$698	\$2,150	4.5%
NC-14	3,130	19,580	3.7%	\$258	\$1,295	4.3%	\$1,114	\$3,136	6.0%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-35. Economic Impact of the Oil and Natural Gas Industry in North Dakota, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
North Dakota	27,150	72,460	12.8%	\$2,661	\$5,580	15.3%	\$12,086	\$16,618	26.1%
ND-1 (At-Large)	27,150	72,460	12.8%	\$2,661	\$5,580	15.3%	\$12,086	\$16,618	26.1%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-36. Economic Impact of the Oil and Natural Gas Industry in Ohio, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Ohio	71,160	351,530	5.0%	\$5,953	\$25,354	5.7%	\$23,305	\$55,503	7.3%
OH-1	2,870	22,220	4.7%	\$285	\$1,891	5.3%	\$753	\$3,230	5.2%
OH-2	4,030	20,090	4.7%	\$732	\$1,961	6.5%	\$1,093	\$2,991	5.7%
OH-3	3,000	23,540	4.7%	\$231	\$1,806	5.0%	\$1,092	\$3,532	5.7%
OH-4	3,970	22,670	4.8%	\$431	\$1,637	5.9%	\$2,695	\$4,904	10.4%
OH-5	5,290	23,380	5.0%	\$254	\$1,383	5.0%	\$765	\$2,828	6.3%
OH-6	10,160	29,510	6.5%	\$459	\$1,504	6.6%	\$4,548	\$6,404	15.6%
OH-7	5,730	25,750	5.1%	\$380	\$1,591	5.7%	\$1,691	\$3,973	8.4%
OH-8	2,950	20,510	4.3%	\$200	\$1,352	4.6%	\$735	\$2,814	5.5%
OH-9	6,310	23,480	5.4%	\$708	\$1,961	6.6%	\$1,805	\$4,039	7.8%
OH-10	2,000	18,540	4.2%	\$171	\$1,340	4.5%	\$445	\$2,298	4.7%
OH-11	2,620	20,810	4.7%	\$287	\$1,755	5.4%	\$979	\$3,118	5.7%
OH-12	7,940	28,850	6.1%	\$792	\$2,270	7.5%	\$2,833	\$5,194	10.5%
OH-13	5,960	26,260	5.6%	\$353	\$1,652	6.1%	\$1,691	\$3,998	9.1%
OH-14	4,350	22,840	4.8%	\$272	\$1,554	5.2%	\$938	\$3,002	6.0%
OH-15	3,980	23,070	4.8%	\$398	\$1,698	5.6%	\$1,243	\$3,179	6.4%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-37. Economic Impact of the Oil and Natural Gas Industry in Oklahoma, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Oklahoma	100,980	351,150	15.3%	\$18,224	\$32,522	23.8%	\$34,748	\$57,514	26.7%
OK-1	21,630	79,650	17.3%	\$5,066	\$9,084	26.0%	\$9,377	\$15,491	29.0%
OK-2	9,680	47,120	11.0%	\$672	\$2,313	11.7%	\$1,813	\$4,406	13.4%
OK-3	29,430	79,280	16.9%	\$2,519	\$4,913	20.5%	\$7,200	\$11,171	27.6%
OK-4	13,250	58,760	12.9%	\$1,175	\$3,416	14.4%	\$2,616	\$6,091	16.5%
OK-5	26,990	86,340	18.2%	\$8,793	\$12,796	37.4%	\$13,742	\$20,356	39.3%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-38. Economic Impact of the Oil and Natural Gas Industry in Oregon, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Oregon	17,170	92,320	3.6%	\$1,397	\$6,978	3.9%	\$3,553	\$12,154	4.5%
OR-1	3,360	18,150	4.0%	\$439	\$1,836	4.6%	\$1,135	\$3,195	5.1%
OR-2	4,360	16,070	4.1%	\$269	\$1,014	4.2%	\$732	\$1,849	5.1%
OR-3	2,500	16,390	3.6%	\$253	\$1,463	3.9%	\$562	\$2,452	4.3%
OR-4	2,770	14,250	3.6%	\$165	\$899	3.6%	\$362	\$1,538	4.0%
OR-5	2,110	13,960	3.2%	\$162	\$1,036	3.4%	\$339	\$1,690	3.8%
OR-6	2,070	13,500	3.2%	\$109	\$730	3.3%	\$423	\$1,430	4.3%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-39. Economic Impact of the Oil and Natural Gas Industry in Pennsylvania, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Pennsylvania	93,060	423,700	5.6%	\$14,285	\$40,286	7.5%	\$35,895	\$75,030	8.9%
PA-1	2,430	22,720	4.5%	\$655	\$2,336	6.4%	\$1,054	\$3,747	6.3%
PA-2	1,300	15,900	4.1%	\$640	\$1,985	6.2%	\$666	\$2,501	5.1%
PA-3	1,140	20,160	4.5%	\$2,342	\$4,564	10.3%	\$3,230	\$6,294	10.1%
PA-4	2,980	23,740	4.8%	\$866	\$2,752	6.8%	\$1,075	\$4,103	6.0%
PA-5	2,700	23,830	4.9%	\$696	\$2,483	6.8%	\$2,265	\$5,042	8.9%
PA-6	3,580	25,800	5.2%	\$547	\$2,712	6.5%	\$1,468	\$5,282	8.3%
PA-7	3,390	23,020	5.1%	\$516	\$1,997	6.5%	\$1,263	\$3,369	7.1%
PA-8	3,870	21,590	5.1%	\$325	\$1,399	5.9%	\$947	\$2,502	6.7%
PA-9	7,970	25,910	6.3%	\$673	\$1,956	7.4%	\$2,402	\$4,201	10.1%
PA-10	4,480	23,560	5.4%	\$1,035	\$2,474	8.1%	\$1,535	\$3,608	7.8%
PA-11	3,760	23,000	4.7%	\$622	\$1,981	6.2%	\$1,132	\$3,214	6.6%
PA-12	5,220	25,570	5.4%	\$345	\$1,628	6.1%	\$2,663	\$4,657	10.6%
PA-13	5,370	21,930	5.2%	\$496	\$1,492	6.3%	\$885	\$2,324	6.3%
PA-14	14,100	35,540	8.3%	\$1,490	\$3,055	10.7%	\$5,936	\$8,326	17.0%
PA-15	11,650	31,700	7.8%	\$750	\$1,970	8.8%	\$3,878	\$5,635	14.8%
PA-16	7,020	25,240	6.2%	\$564	\$1,715	7.2%	\$2,119	\$3,839	10.3%
PA-17	12,130	34,480	7.5%	\$1,722	\$3,787	10.2%	\$3,375	\$6,384	11.0%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-40. Economic Impact of the Oil and Natural Gas Industry in Rhode Island, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Rhode Island	4,520	23,900	3.7%	\$593	\$1,984	4.6%	\$1,442	\$3,634	5.5%
RI-1	2,110	11,450	3.7%	\$270	\$965	4.4%	\$633	\$1,668	5.0%
RI-2	2,410	12,450	3.8%	\$324	\$1,019	4.8%	\$809	\$1,965	5.9%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-41. Economic Impact of the Oil and Natural Gas Industry in South Carolina, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
South Carolina	26,630	109,800	3.8%	\$1,054	\$6,178	3.7%	\$4,839	\$13,209	4.9%
SC-1	1,990	13,910	3.2%	\$73	\$858	3.2%	\$231	\$1,437	3.4%
SC-2	3,790	15,910	3.8%	\$157	\$911	3.7%	\$920	\$2,188	5.4%
SC-3	3,650	14,280	3.6%	\$123	\$718	3.5%	\$507	\$1,502	4.2%
SC-4	4,430	18,410	4.1%	\$236	\$1,156	4.3%	\$1,109	\$2,551	6.0%
SC-5	3,860	16,050	3.9%	\$163	\$952	4.0%	\$756	\$1,996	5.2%
SC-6	4,860	16,120	3.9%	\$178	\$904	3.7%	\$870	\$2,069	5.2%
SC-7	4,050	15,130	4.1%	\$125	\$679	3.7%	\$448	\$1,465	4.8%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-42. Economic Impact of the Oil and Natural Gas Industry in South Dakota, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
South Dakota	9,470	28,700	4.6%	\$405	\$1,709	4.4%	\$1,174	\$3,327	5.4%
SD-1 (At-Large)	9,470	28,700	4.6%	\$405	\$1,709	4.4%	\$1,174	\$3,327	5.4%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-43. Economic Impact of the Oil and Natural Gas Industry in Tennessee, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Tennessee	36,220	168,940	4.0%	\$2,697	\$12,189	4.4%	\$7,569	\$22,355	5.2%
TN-1	4,090	16,910	4.1%	\$271	\$1,000	4.4%	\$769	\$1,885	5.4%
TN-2	4,330	20,220	4.2%	\$246	\$1,375	4.4%	\$744	\$2,559	5.4%
TN-3	4,390	18,240	4.2%	\$286	\$1,274	4.3%	\$708	\$2,328	5.1%
TN-4	3,710	17,510	3.6%	\$241	\$1,105	3.9%	\$573	\$2,011	4.3%
TN-5	2,100	18,550	3.7%	\$350	\$1,926	4.3%	\$712	\$3,151	4.8%
TN-6	4,420	19,990	3.9%	\$297	\$1,246	4.2%	\$551	\$2,079	4.7%
TN-7	5,240	21,470	4.2%	\$369	\$1,610	4.5%	\$1,451	\$3,286	6.2%
TN-8	4,480	16,870	3.8%	\$268	\$1,051	4.0%	\$717	\$1,947	4.8%
TN-9	3,450	19,180	4.4%	\$369	\$1,603	5.0%	\$1,344	\$3,109	6.4%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-44. Economic Impact of the Oil and Natural Gas Industry in Texas, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Texas	507,850	2,455,990	13.4%	\$100,858	\$235,411	19.3%	\$244,095	\$454,506	22.2%
TX-1	17,640	69,210	15.7%	\$2,867	\$5,787	23.4%	\$6,300	\$11,441	27.8%
TX-2	10,460	54,170	11.7%	\$1,801	\$5,686	13.9%	\$3,592	\$9,784	14.1%
TX-3	2,850	65,590	12.2%	\$505	\$5,642	14.1%	\$875	\$8,232	12.5%
TX-4	4,300	62,180	11.4%	\$529	\$3,510	13.2%	\$1,818	\$6,849	15.2%
TX-5	3,440	49,650	10.4%	\$504	\$3,369	11.4%	\$1,201	\$5,370	10.9%
TX-6	8,100	52,360	11.2%	\$1,214	\$3,960	14.2%	\$2,457	\$6,668	13.9%
TX-7	46,440	111,050	19.3%	\$8,942	\$14,770	30.7%	\$18,860	\$27,708	36.5%
TX-8	5,940	57,070	11.1%	\$531	\$3,825	12.1%	\$957	\$6,243	11.8%
TX-9	13,520	57,900	12.6%	\$3,055	\$6,406	19.2%	\$8,268	\$12,865	24.8%
TX-10	9,620	58,770	12.2%	\$1,746	\$5,471	15.9%	\$3,082	\$8,304	15.1%
TX-11	65,590	128,250	27.1%	\$17,350	\$22,293	59.9%	\$36,670	\$45,748	69.7%
TX-12	16,050	71,030	13.3%	\$4,160	\$7,728	22.6%	\$7,917	\$13,589	23.5%
TX-13	19,510	83,650	16.8%	\$2,361	\$6,142	22.0%	\$12,001	\$18,568	39.1%
TX-14	19,250	69,020	15.7%	\$3,196	\$6,314	23.4%	\$12,394	\$18,733	30.8%
TX-15	10,500	56,800	13.6%	\$1,313	\$3,370	18.0%	\$3,433	\$6,779	23.3%
TX-16	2,980	44,410	11.3%	\$689	\$2,943	13.5%	\$1,428	\$4,609	13.8%
TX-17	5,980	49,880	11.0%	\$535	\$3,380	11.8%	\$1,544	\$5,636	11.8%
TX-18	12,710	56,610	12.5%	\$2,127	\$6,187	14.8%	\$3,442	\$9,572	13.4%
TX-19	20,510	75,400	16.1%	\$2,136	\$5,051	20.3%	\$6,940	\$11,402	27.2%
TX-20	2,650	44,910	10.1%	\$266	\$2,885	10.1%	\$591	\$4,442	9.8%
TX-21	4,720	59,900	11.7%	\$1,666	\$5,709	15.9%	\$2,315	\$8,430	14.7%
TX-22	7,150	59,800	10.8%	\$1,315	\$4,382	13.8%	\$1,704	\$6,890	13.1%
TX-23	24,750	70,210	16.3%	\$3,687	\$6,507	25.2%	\$10,389	\$14,959	35.0%
TX-24	8,340	68,190	13.5%	\$2,726	\$8,204	19.3%	\$4,743	\$12,536	18.6%
TX-25	13,700	66,330	12.8%	\$3,570	\$7,394	20.6%	\$6,339	\$12,036	21.2%
TX-26	7,220	77,070	12.6%	\$1,058	\$5,584	15.3%	\$2,073	\$10,220	16.8%
TX-27	23,180	83,260	18.2%	\$4,596	\$8,154	31.4%	\$12,856	\$19,178	39.7%
TX-28	13,930	58,010	13.7%	\$2,849	\$5,061	23.3%	\$6,146	\$9,773	27.4%
TX-29	23,960	60,230	15.2%	\$6,503	\$9,331	29.3%	\$12,991	\$16,932	30.0%
TX-30	5,860	52,670	11.3%	\$2,552	\$6,526	17.0%	\$4,266	\$9,887	15.6%

(continued on next page)

Table C-44. Economic Impact of the Oil and Natural Gas Industry in Texas, 2021, continued

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
TX-31	2,580	50,760	10.5%	\$161	\$3,846	11.1%	\$333	\$5,243	10.1%
TX-32	7,140	63,180	12.3%	\$2,273	\$7,577	15.8%	\$4,689	\$12,325	16.0%
TX-33	4,580	50,080	11.0%	\$726	\$4,284	12.3%	\$1,710	\$6,624	11.4%
TX-34	3,920	36,300	9.8%	\$182	\$1,566	9.3%	\$494	\$2,612	9.8%
TX-35	3,750	55,560	11.3%	\$715	\$4,539	13.5%	\$1,595	\$6,989	12.7%
TX-36	20,460	66,380	15.2%	\$4,255	\$7,567	24.1%	\$12,663	\$18,384	30.8%
TX-37	2,980	62,090	10.3%	\$470	\$3,778	11.5%	\$1,005	\$5,982	11.1%
TX-38	31,580	98,060	19.2%	\$5,726	\$10,685	30.3%	\$24,012	\$32,965	45.6%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-45. Economic Impact of the Oil and Natural Gas Industry in Utah, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Utah	19,780	104,590	4.7%	\$1,559	\$7,171	5.3%	\$5,752	\$15,029	6.7%
UT-1	3,660	24,060	4.2%	\$187	\$1,380	4.4%	\$2,268	\$4,319	8.3%
UT-2	6,430	30,480	5.5%	\$754	\$2,396	6.9%	\$1,950	\$4,561	7.8%
UT-3	7,220	29,540	5.2%	\$453	\$1,895	5.7%	\$1,160	\$3,691	6.7%
UT-4	2,460	20,510	3.9%	\$165	\$1,501	4.2%	\$373	\$2,458	4.1%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-46. Economic Impact of the Oil and Natural Gas Industry in Vermont, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Vermont	5,480	18,230	4.3%	\$275	\$1,073	4.4%	\$789	\$2,060	5.6%
VT-1 (At-Large)	5,480	18,230	4.3%	\$275	\$1,073	4.4%	\$789	\$2,060	5.6%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-47. Economic Impact of the Oil and Natural Gas Industry in Virginia, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Virginia	41,520	185,430	3.5%	\$2,473	\$13,653	3.6%	\$8,599	\$26,606	4.4%
VA-1	2,800	16,040	3.0%	\$141	\$950	3.2%	\$721	\$2,196	4.5%
VA-2	3,510	15,740	3.4%	\$187	\$972	3.3%	\$946	\$2,394	5.0%
VA-3	3,090	14,050	3.4%	\$170	\$960	3.3%	\$641	\$1,762	3.9%
VA-4	4,640	17,220	3.8%	\$313	\$1,219	3.9%	\$1,092	\$2,686	4.9%
VA-5	4,570	16,980	3.5%	\$192	\$875	3.4%	\$591	\$1,971	4.5%
VA-6	5,330	19,060	4.0%	\$273	\$1,022	4.0%	\$1,183	\$2,448	5.8%
VA-7	2,830	15,400	3.1%	\$188	\$1,177	3.3%	\$593	\$2,217	3.6%
VA-8	1,840	15,390	2.9%	\$229	\$1,896	3.3%	\$750	\$3,173	3.8%
VA-9	8,140	21,620	5.3%	\$291	\$1,015	5.1%	\$729	\$1,896	5.6%
VA-10	2,960	18,060	3.2%	\$240	\$1,725	3.6%	\$547	\$2,734	3.9%
VA-11	1,800	15,870	3.0%	\$250	\$1,843	3.6%	\$806	\$3,129	4.2%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-48. Economic Impact of the Oil and Natural Gas Industry in Washington, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Washington	24,410	153,610	3.4%	\$2,233	\$14,412	3.7%	\$12,443	\$32,670	4.8%
WA-1	1,260	14,430	2.9%	\$101	\$1,887	3.5%	\$264	\$3,158	3.2%
WA-2	5,210	21,500	4.6%	\$813	\$2,017	5.9%	\$5,747	\$7,950	13.0%
WA-3	2,310	14,900	3.3%	\$120	\$996	3.3%	\$485	\$2,005	3.9%
WA-4	2,820	14,420	3.6%	\$178	\$920	3.6%	\$1,056	\$2,115	5.2%
WA-5	2,750	15,460	3.6%	\$176	\$1,010	3.7%	\$1,153	\$2,733	6.2%
WA-6	2,450	13,690	3.3%	\$232	\$1,000	3.5%	\$1,155	\$2,616	5.9%
WA-7	1,110	17,530	3.1%	\$120	\$2,528	3.7%	\$554	\$4,198	3.5%
WA-8	2,400	14,160	3.1%	\$144	\$1,286	3.2%	\$552	\$2,425	3.3%
WA-9	2,510	15,500	3.3%	\$263	\$1,908	3.6%	\$1,286	\$3,887	4.0%
WA-10	1,590	12,010	2.9%	\$85	\$861	2.8%	\$191	\$1,584	3.3%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-49. Economic Impact of the Oil and Natural Gas Industry in West Virginia, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
West Virginia	25,460	73,120	8.5%	\$1,884	\$4,762	9.9%	\$8,132	\$12,856	15.0%
WV-1	13,190	34,100	8.7%	\$1,061	\$2,397	10.2%	\$3,840	\$5,933	14.4%
WV-2	12,270	39,020	8.3%	\$822	\$2,364	9.6%	\$4,292	\$6,923	15.6%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-50. Economic Impact of the Oil and Natural Gas Industry in Wisconsin, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Wisconsin	38,410	150,530	4.1%	\$1,751	\$9,380	4.0%	\$4,653	\$16,874	4.6%
WI-1	2,990	15,740	3.6%	\$125	\$969	3.5%	\$315	\$1,612	3.7%
WI-2	4,250	18,880	3.8%	\$179	\$1,292	3.7%	\$426	\$2,252	3.9%
WI-3	6,810	21,400	4.6%	\$243	\$1,110	4.2%	\$508	\$1,862	4.5%
WI-4	1,620	13,910	3.5%	\$93	\$1,079	3.6%	\$344	\$1,901	4.1%
WI-5	4,230	18,570	3.9%	\$242	\$1,291	4.0%	\$559	\$2,196	4.4%
WI-6	5,880	19,740	4.3%	\$278	\$1,184	4.2%	\$630	\$2,150	4.8%
WI-7	7,190	22,080	4.7%	\$299	\$1,178	4.5%	\$783	\$2,210	5.4%
WI-8	5,430	20,200	4.4%	\$292	\$1,276	4.5%	\$1,089	\$2,691	6.1%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

Note: Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Table C-51. Economic Impact of the Oil and Natural Gas Industry in Wyoming, 2021

State / Congressional District	Employment (Jobs) ⁽¹⁾			Labor Income (\$Million) ⁽²⁾			Value Added (\$Million)		
	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District	Direct	Total ⁽³⁾	Total as a % of State / District
Wyoming	20,340	58,780	14.4%	\$3,548	\$5,660	23.3%	\$8,332	\$11,871	28.6%
WY-1 (At-Large)	20,340	58,780	14.4%	\$3,548	\$5,660	23.3%	\$8,332	\$11,871	28.6%

Source: PwC calculations using the IMPLAN model and data from the Census Bureau and the Bureau of Labor Statistics.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(3) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the oil and natural gas industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the oil and natural gas industry. Induced impacts are those arising from household spending of income earned from the oil and natural gas industry or its supply chain.

Appendix D: Data Sources and Methodology

This Appendix describes the methodology used to derive the results for the study. It first discusses the data sources PwC utilized to develop estimates of the US oil and natural gas industry's direct employment, labor income, and value-added impacts and its capital investment and dividend impacts. It then describes the development of the indirect and induced impact estimates.

Estimating the Direct Jobs, Labor Income and Value Added

PwC's employment estimates for the oil and natural gas industry include both full-time and part-time workers as well as self-employed business owners. The *State Annual Personal Income and Employment* data set published by the US Bureau of Economic Analysis ("BEA") is the only source on total employment including self-employed individuals by industry. In cases where there is a one-to-one correspondence between the subsectors of the oil and natural gas industry as defined by PwC and the BEA sectors, we use the BEA data on employment, labor income and GDP without any further adjustment. This is the case for three NAICS codes: NAICS Code 211 (Oil and gas extraction), NAICS Code 447 (Gasoline stations), and NAICS Code 486 (Pipeline transportation).

For the remaining subsectors for the oil and natural gas industry, which are more disaggregated compared to the BEA data, PwC obtained each subsector's paid employment from the US Bureau of Labor Statistics ("BLS"). PwC then estimated total self-employment for the more aggregated industry using the BEA data and allocated across the subsectors according to each subsector's share of paid employment. For example, self-employment was estimated for NAICS sector 213 (Support Activities for Mining) and then allocated across its five subsectors including 213111 (Drilling Oil and Gas Wells) and 213112 (Support Activities for Oil and Gas Operations). In a limited number of cases, data from the Census Bureau's *Nonemployer Statistics* was used to allocate self-employment across subsectors.¹⁵

Direct employment was separately estimated for the US as a whole, each of the 50 states and the District of Columbia, and each Congressional District. The state-level estimates were then scaled to match the national level estimates, and the Congressional District-level estimates were also scaled to match the state-level estimates.

A similar methodology was used to estimate labor income and GDP for sectors where there was not a one-to-one correspondence between the subsectors of the oil and natural gas industry (as defined in this report) and the BEA sectors.

Estimating Capital Investment Impact

PwC estimated the oil and natural gas industry's capital expenditures for 2021 based on data from the Census Bureau and the BEA. For the impact analysis, the industry's capital spending was translated into purchases of capital assets by type through the use of the so-called "capital flow matrix" from the BEA.

¹⁵ A nonemployer is a business without paid employees. Most nonemployers are self-employed individuals operating small unincorporated businesses, which may or may not be the owner's principal source of income.

Estimating Dividend Impact

PwC obtained data on common stock dividend payments by publicly traded companies in the US oil and natural gas industry.¹⁶ Dividend payments were allocated among (1) US households, (2) foreign shareholders, (3) retirement plans, (4) governments, and (5) other businesses using data from the Federal Reserve Board's *Financial Accounts of the United States*.

For the purpose of estimating the industry's dividend impact, only dividends paid by publicly traded companies in the oil and natural gas industry to US households and retirement plans are considered. Dividends paid to US households were allocated by income group and across the 50 states and the District of Columbia using tax return data published by the Internal Revenue Service (IRS)'s Statistics of Income Division.

Dividends paid to pension plans and other retirement accounts were allocated across income groups based on data on retirement assets by income quintile obtained from the 2019 *Survey of Consumer Finances*, conducted by the Federal Reserve. The data were then allocated across the 50 states and the District of Columbia using data on the distribution of assets in 401(k) and thrift savings accounts from the *Survey of Income and Program Participation* conducted by the US Census Bureau. These data were combined with the data on dividends paid directly to US households by publicly traded companies in the oil and natural gas industry to derive our estimates of total dividends paid by publicly traded companies in the industry to residents in each state.

To quantify the economic impact resulting from these dividend payments, PwC first converted them into additional household consumption expenditures. For dividends paid directly to households, after-tax dividend income was estimated by income class based on average tax rates on dividend income. The additional consumption from dividends paid directly to households was estimated using published estimates of the marginal propensity to consume out of after-tax dividend income.¹⁷ Similarly, the additional consumption resulting from dividends paid to retirement accounts was estimated based on published estimates of the marginal propensity to consume out of wealth.¹⁸ This estimate is done at the national and state level.

At the congressional district level, PwC obtained data on qualified dividends by zip code from the IRS. These zip code level data are then mapped to each congressional district. The state-level estimates on the additional consumption from after-tax dividends are allocated to each congressional district based on the distribution of qualified dividends at the district level.

¹⁶ The measure of dividends used includes cash dividends from all classes of common stock out of income from US operations by publicly traded US corporations in the oil and natural gas industry. It also includes dividends paid to US shareholders out of income from US operations by foreign corporations in the industry. It does not include the dollar value of stock dividends or dividends paid or accrued on preferred stock.

¹⁷ The marginal propensity to consume out of dividend income is a measure of the additional consumption resulting from the last dollar of dividend income earned. The MPCs used for this study were based on Malcolm Baker, Stefan Nagel, and Jeffrey Wurgler, "The Effects of Dividends on Consumption" *Brookings Papers on Economic Activity*, 2007, pgs. 213-291. Using two micro data sets the authors estimated pre-tax MPCs ranging from 0.25 to 0.77. Using the authors' midpoint estimate of 0.4, PwC estimated the after-tax MPC for each income group as the pre-tax MPC divided by one minus the marginal effective tax rate on dividend income.

¹⁸ A review of the literature suggests that each additional dollar of financial wealth increases consumption between two and six cents. To be conservative we have assumed an MPC out of wealth of 0.028 for all income groups (based on Gabriel Chodorow-Reich, Plamen T. Nenov, and Alp Simsek, "Stock Market Wealth and the Real Economy: A Local Labor Market Approach," working paper, June 7, 2019).

Estimating the Indirect and Induced Economic Impacts

The initial round of output, income, and employment generated by the operations of the oil and natural gas industry leads to successive rounds of re-spending in the chain of production and through the personal consumption spending of industry and supplier employees. Such indirect and induced economic impacts can be measured using various approaches. The most common is multiplier analysis. In broad terms, a multiplier is an index that indicates the overall change in the level of economic activity that results from a given initial change. It effectively adds up all the successive rounds of re-spending, based on a number of assumptions that are embedded in the method of estimation.

There are different methods available for calculating multipliers. The method used in this report is *input-output* analysis. It is the most commonly used approach in regional economic impact studies. The input-output model developed by IMPLAN is a well-known input-output model for regional economic studies in the United States and is widely used by government, academics and private-sector researchers.¹⁹

The IMPLAN model is built around an “input-output” table that relates the purchases that each industry has made from other industries to the value of the output of each industry. To meet the demand for goods and services from an industry, purchases are made in other industries according to the patterns recorded in the input-output table. These purchases in turn spark still more purchases by the industry’s suppliers, and so on. Additionally, employees and business owners make personal purchases out of the additional income that is generated by this process, sending new demands rippling through the economy. Multipliers describe these iterations. The Type I multiplier measures the direct and indirect effects of a change in economic activity. It captures the inter-industry effects only, i.e., industries buying from local industries. The Type II (Social Accounting Matrix or SAM) multiplier captures the direct and indirect effects, and, in addition, it also reflects induced effects (i.e., changes in spending from households as income increases or decreases due to the changes in production). The indirect and induced impacts by the oil and natural gas industry on other sectors of the economy in terms of employment, labor income (including wages and salaries and benefits as well as proprietors’ income), and value added were calculated through the multiplier process built into the model.²⁰

For this study, PwC built customized IMPLAN input-output models for the national economy, each state and the District of Columbia, and each Congressional District to calculate the oil and natural gas industry’s *indirect* and *induced* economic impact on each study area in terms of employment, labor income, and value added.

Because IMPLAN regional models capture only the indirect and induced effects within a study area, the indirect and induced effects crossing state borders (“cross-state spillover effects”) are not captured by the IMPLAN state models. PwC quantified the cross-state “spillover effects” and allocated them proportionally to each state. The state indirect and induced effects reported throughout this study include such allocation of the cross-state spillover effects. Similar modeling was performed at the congressional district level to capture cross-district spillover effects.

¹⁹ More information on IMPLAN is available at www.implan.com.

²⁰ Because the IMPLAN models are used for total impact analysis (as opposed to marginal impact analysis) in this study, necessary adjustments are made to the initial indirect and induced impact estimates to prevent double counting. For instance, any indirect or induced effects from the estimates that are mapped to the oil and natural gas industry are removed.

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working together—we can do anything—

Shown here: EQT works with local first responders on preparedness



2022 Community Impact / Sustainability

R E P O R T



2022 community impact / sustainability report



Robert Brundrett, President
Ohio Oil & Gas Association

Ohio's oil and natural gas producers have been fueling our state and the country for more than 150 years. We are proud of the work we do, the family-sustaining jobs we have created and the ingenuity we display to make Ohio an economic powerhouse in the United States.

The world is changing at a rapid pace, and the members of the Ohio Oil and Gas Association are at the forefront of a technological revolution that will ensure our communities have the energy needed to compete in a 21st century economy. Our members also understand the need for transparency and are keenly aware of the environmental sensibilities that are required from a public and regulatory point of view. We live here, and we are passionate about making our communities great places to live.

This is OOGA's first Community Impact and Sustainability Report, but it certainly isn't the beginning of our story. Our membership comprises both large and small operators, and throughout this report, you will see the contributions from all our members make life in Ohio better every single day.

I am new to leading OOGA, but I have witnessed what our industry is capable of, and understand the power of domestic energy production and how it brings communities to life.

On the environmental front, our report showcases the incredible investment our members are making in methane detection and abatement technology. Ohio's operators have led the way in implementing both drone and fixed surveying equipment that notifies us when a potential methane leak occurs. The proof is in the numbers. Thanks in large part to the efforts of our members, studies show Ohio has seen a dramatic decrease in SO_x, NO_x and CO₂ in recent years.

In addition to the environmental benefits our producers provide Ohioans, our local communities are the direct beneficiaries of our activity through taxes paid, jobs provided, and road use

maintenance agreements that ensure our local roads are safe for all travelers. OOGA's members are proud to support a robust charitable program totaling millions of dollars distributed to many worthwhile organizations in communities across Ohio.

More than 208,000 people work in our industry every day. They don't go to work looking for adulation or cheering crowds, they do it because the work is important and critically necessary to maintain our way of life. But it is important for everybody to understand how our members are evolving in a changing landscape. Our work to improve never stops, and our member companies never stop improving.

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Photo: Ascent Resources



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making an impact

the environment

The technological advances our members and other leading producers are implementing in our operations are changing the way Americans think about energy, while preparing us for a safer, sustainable future.

(Learn more on page 4)

our communities

OOGA's membership takes pride in giving back to the communities that have long supported us. Our members have partnered with hundreds of local and national non-profits, charities, and other critical organizations.

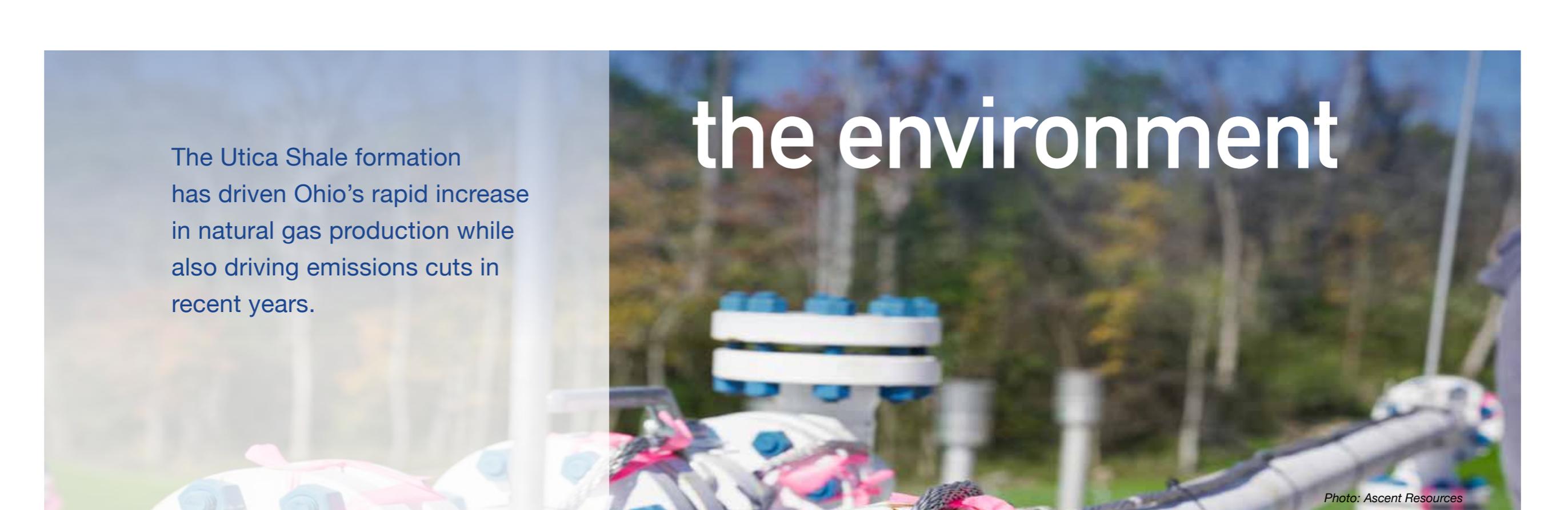
(Learn more on page 13)

and education

The Ohio Oil and Gas Energy Education Program (OOGEEP) is the statewide non-profit organization dedicated to education, safety and public outreach for Ohio natural gas and oil.

(Learn more on page 18)

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the environment

The Utica Shale formation has driven Ohio's rapid increase in natural gas production while also driving emissions cuts in recent years.

Photo: Ascent Resources

Ohio's Operators are Leading the Way in Environmental Excellence

In 1859, a blacksmith named William Jeffrey drilled the first well intended to produce petroleum products in Trumbull County, Ohio. Life in our state would never be the same. Since that time a spirit of discovery and ingenuity, combined with a legendary work ethic, has propelled Ohio's oil and gas producers to power Ohio.

Today, small independent producers and large shale gas operators join forces to make our communities stronger, and our environment cleaner.

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15x more

natural gas was produced
in 2018 than in 1990

15% less

less CO₂ emissions
in 2018 than in 1990

Committed to Monitoring
and Reducing Emissions
in Ohio

The Utica Shale formation has driven Ohio's rapid increase in natural gas production while also driving emissions cuts in recent years. Ohio produced 15 times more natural gas in 2018 than in 1990 while simultaneously cutting CO₂ emissions by 37.3 Mmt (15 percent).

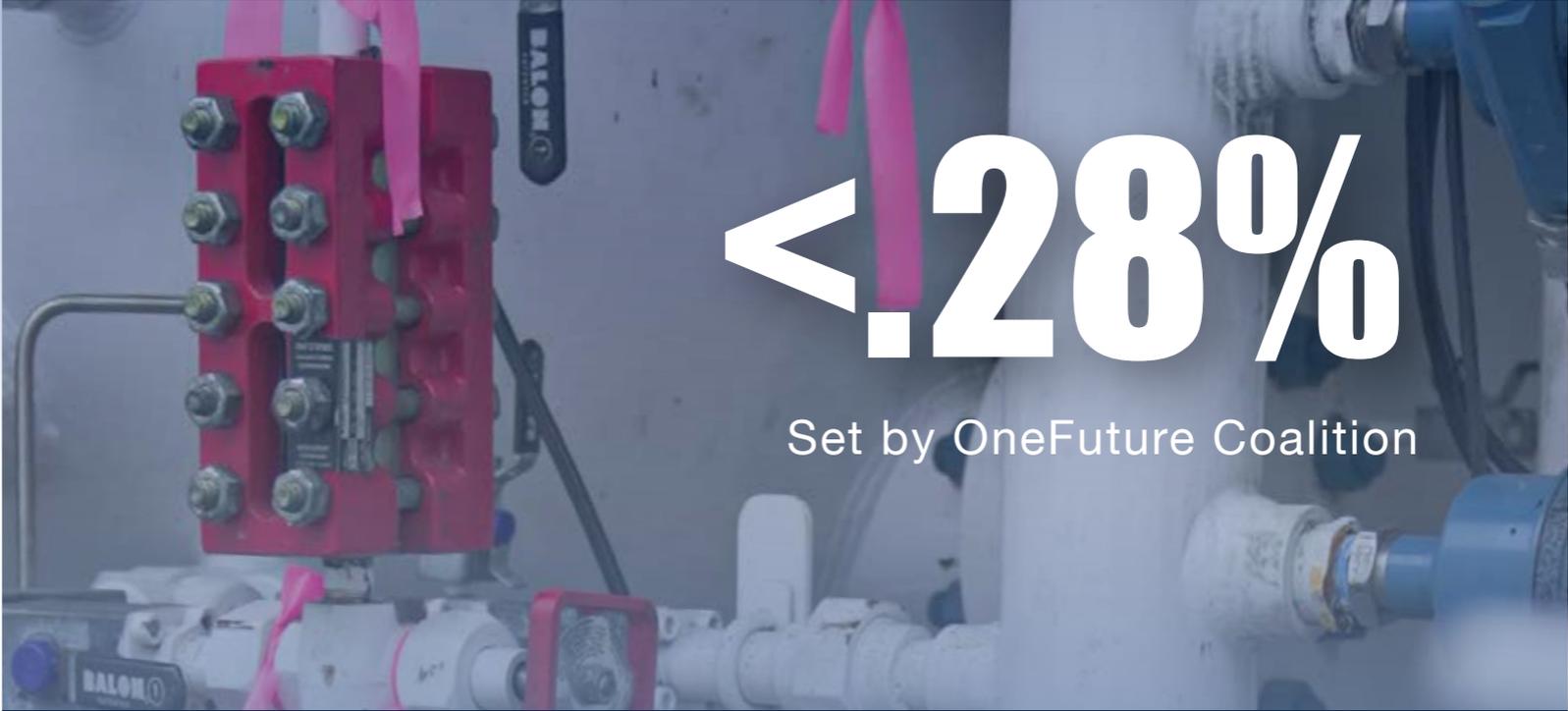
37.3 Mmt

Reduction from 1990 to 2018

Source: Energy Information Administration, 2021 | Credit: Energy In Depth

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Many of OOGA's member companies calculate their methane intensity score, and the results they produce are some of the best in the industry, with many producers falling well below the .28 percent goal the OneFuture Coalition has set to limit methane emissions from production operations.



<.28%

Set by OneFuture Coalition

Reducing Methane Emissions from Our Production Operations

Our members have implemented the latest methane detection technology in recent years. Member locations utilize both fixed methane monitoring equipment and aerial surveying. Fixed monitors can and do “constantly monitor” methane emissions,

while satellite, aerial and drone surveys only “monitor” when in use above the given location. Our companies are utilizing cutting edge technology from leading platforms to ensure they have the information and training to act in real-time when methane leaks occur.

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Under certain conditions, substituting existing pneumatic devices with lower-emitting controllers, powered by compressed air or electricity, is one strategy operators can implement to lessen methane emissions from their operations.



Ascent Resources reduced methane and GHG intensities in 2021 by approximately —

20%

Photo: Ascent Resources

OOGA Members are Investing in Upgrading Pneumatic Devices to Limit Methane Emissions

In 2021, Ascent initiated an emissions reductions campaign that identified over 40 potential projects. At the top of the list was converting 4,800 low- or intermittent-bleed pneumatic controllers to instrument air at a cost of \$1,700 per device. In just 6 months,

Ascent completed nearly one-third of the necessary retrofits. This is one example of a multitude of projects that helped Ascent reduce its already low methane and GHG intensities by approximately 20% as compared to 2020. Ascent's long-held

commitment to leading the way on environmentally responsible operations is exemplified by this effort and validated by its four-pad pilot project Platinum level certification from Project Canary/TrustWell.™

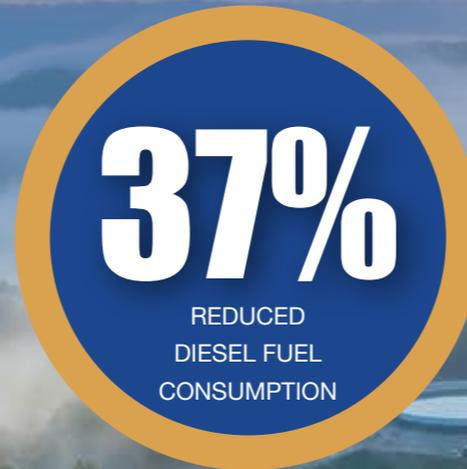
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Ohio's operators are utilizing the latest in completions technology to reduce emissions.

By utilizing dual fuel applications (natural gas and diesel) in Antero's completions activities in its operational area, the company was able to avoid approximately 2,766 metric tons of CO₂e in 2020.

Other OOGA members are using this approach to reduce emissions.

Photo: Antero Resources



In Ohio, Antero used a bi-fuel fleet to complete 2 pads in 2021 which replaced approximately 37% of its diesel consumption.

**Bi-fuel Fleet =
Reduced Diesel
Consumption**

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WORK GREEN

**Gulfport Energy
Plants Over 200
Trees in 2021-
Belmont County, OH**

Gulfport Energy's WORK GREEN initiative is a unique program developed to guide the company's work every day. It focuses their actions on reducing emissions, minimizing its footprint and protecting water resources. In 2021, Gulfport's local Ohio workforce successfully planted over 200 trees in Belmont County's Fox Shannon Park to highlight the firm's commitment to responsible environmental stewardship.

over 200 trees planted in 2021

Photos: Gulfport Energy

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OOGA'S Midstream and Pipeline Members are investing to limit emissions

Ohio's midstream and pipeline member companies are working to ensure they have the technology in place to identify and decrease emissions from operations. More than 70% of Ohio households depend on natural gas to heat their homes, and pipeline operators work diligently to ensure our homes, schools and businesses have the natural gas they need every day.



Cutting Edge Technology Cuts Emissions

Dominion Energy has taken meaningful action toward its ambitious environmental commitments by reducing emissions across its footprint, modernizing infrastructure, and adopting breakthrough technologies such as Zero Emission Vacuum and Compression (ZEVAC®). ZEVAC® units have been implemented across

Dominion Energy's pipeline systems, enabling the company to capture and recycle natural gas during maintenance and inspections to prevent more than 250,000 metric tons of methane from entering the atmosphere.

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Sharing Water

Operators Working with Operators—To Save Water

Ohio's oil and gas companies are dedicated to being excellent stewards of our state's water resources. Water sharing agreements and innovative projects have helped our member companies find ways to limit our overall water consumption.

Innovation is a hallmark of the oil and gas industry and Ohio's oil and gas companies fit right in. Several operators have arranged to share information about water that increases reuse and decreases the amount of freshwater needed.



“ If we are not able to reuse water ourselves, we work to safely share it with other operators for use in their operations, sparing it from disposal. We also receive produced water from other operators when logistics and water quality align with our needs. ”
—Southwestern Energy

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Wetlands Conservation

Energy Transfer's support of Ducks Unlimited (DU) has benefited more than a dozen on-going conservation projects in Ohio through DU's Big Rivers Initiative and Great Lakes Initiative. These efforts protect, enhance and restore waterfowl nesting and migration habitat and improve outdoor recreational opportunities throughout the state. Ducks Unlimited has made significant progress on several major projects, including the enhancement of the 56-acre Delaware Wildlife Area, the transfer of two properties to the U.S. Fish and Wildlife Service and the enhancement of Toussaint Wildlife Area.



Energy Transfer Restoration Projects*

-  Schiller Restoration
-  Weber Restoration

* in partnership with Ducks Unlimited

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Photo: OOGEEP



Sound Energy supports local youth sports

Photo: Sound Energy



Photo: OOGEEP

our communities

A survey of our membership found 100% of our respondents provide support in the form of financial donations or manpower to charitable organizations in Ohio.

OOGA's membership takes pride in giving back to the communities that have long supported us. Our members have partnered with hundreds of local and national non-profits, charities, and other critical organizations. We are dedicated to diverse and impactful programs, from community health and wellness, education, and athletics,

to food security, housing, and economic empowerment. Our businesses, employees, and neighbors thrive here—we strive to be hands-on and valuable contributors in building a better future for all stakeholders.

Monetary giving without boots-on-the-ground engagement is not enough to meet our standards. Our members and their employees have spent tens of thousands of hours

volunteering for projects in their local communities. Volunteers have dedicated their time to a wide range of initiatives, including Toys for Tots, Ohio 4H, food banks, and community parks.

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Toys For Tots

The Association, our members, and their staff volunteers are proud of our partnership with Toys for Tots Foundation. What started as a much smaller effort in 2014, has turned into one of our association's most cherished efforts. For the past eight years, we have worked to support the special mission of distributing Christmas gifts and cheer to less fortunate children across Ohio.

In 2021, OOGA raised nearly \$50,000, with generous donations from Ascent Resources, Carroll Energy, EQT, Equitrans Midstream, Energy Transfer, Equinor, Seneca Resources, Southwestern Energy, Pin Oak Energy Partners and Williams. Our staff and volunteers from our member companies purchase gifts locally, and then we distribute the gifts to families throughout Belmont County, Monroe County, Harrison County, Jefferson County and Carroll County. Toys for Tots brings hope and joy to children in eastern Ohio. As an Association, we believe to whom much is given, much is expected and we carry out that mission each year with the communities that we operate in across eastern Ohio.

OOGA raised nearly fifty thousand dollars
for the Toys For Tots Foundation

\$50,000



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Covid-19

Our Members—Supporting Our Communities



Covid-19 Assistance

The Covid-19 pandemic has had a major impact on the way we live our lives, forcing many individuals and organizations into economic hardship. During this unprecedented time, OOGA and its members have been on the front lines and among grassroots efforts to improve the livelihoods of Ohioans.

When the magnitude of the crisis began to be felt and resources were desperately needed by those on the front lines, OOGA stepped up and distributed half a million masks and bottles of sanitizer to Emergency Management Agencies across Ohio. The supplies proved to be a needed bridge to help Ohioans until the manufacturing process could catch up with the need for the in-demand, but nearly impossible to find items.

Photo:
**Eastern Ohio
EMA Directors
received needed
supplies**

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Generational Opportunities

Some people are born with the industry in their blood. Dave Fritz has been working as a well tender in Ohio for almost 50 years and has been with the Artex Oil Company since 2000. His son Bob started riding along with his father when he was young, and after high school and vocational training in Zanesville he joined him in the southern oil fields. Dave's youngest son Casey has also joined them as an engineer working for Artex after studying at the University of Akron, making it a truly generational opportunity for the Fritz family.

Dave Fritz has been working as a well tender in Ohio for almost 50 years and has been with Artex Oil Company since 2000.

**Photo:
Dave Fritz,
his son Bob,
and brother
Casey**

**- Artex Oil
Company**



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Investing in Ohio's infrastructure

Road Use Maintenance Agreements

The health of our infrastructure is essential to the economic livelihoods of individuals and to enable the growth of businesses of all sizes. Over the last ten years, OOGA members have dedicated over \$400 million dollars in Road Use Maintenance Agreements to ensure that everyone has access to safe and reliable roads.

Ad Valorem Taxes

Our survey found oil and gas producers paid nearly \$850 million in Ad Valorem taxes in the past ten years. This money goes directly to local governments and schools.

“ The development of well sites benefited roads in Jefferson County, with companies investing an estimated \$25,000,000.00 on county and \$15,000,000.00 on township road upgrades to sites. ”

Terry Bell,
Secretary of the Jefferson County
Township Association

making an impact

\$850,000,000

—in Ad Valorem taxes in the past ten years

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OOGEEP is dedicated to education, safety and public outreach for Ohio natural gas and oil.



energy education

Ohio Oil and Gas Energy Education Program – Community Impact Report

Founded in 1998, the Ohio Oil and Gas Energy Education Program (OOGEEP) is the statewide non-profit organization dedicated to education, safety and public outreach for Ohio natural gas and oil. Since its inception, over \$23 million has been invested by the natural gas and oil industry into the organization, supporting Ohio communities

through educational empowerment. OOGEEP operates several programs and a foundation to fulfill its mission, with many initiatives and services impacting historically underserved and rural populations in all parts of the state.

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Public Education

OOGEEP has established itself as a thought leader and trusted source of information. A key mission is informing and educating Ohioans about the impact of natural gas and oil in the state. This is done in a variety of ways, including, public speaking events, and meetings with community leaders such as elected officials, businesses, and economic development entities. The organization also communicates externally via social media channels and is a go-to-source for media outlets across Ohio and the nation.

Essential Ohio Energy Campaign

This award-winning campaign has reached over 14.2 million people since launching in the fall of 2020. The ads highlight the many ways Ohio made natural gas and oil is essential in our daily lives beyond transportation and electric generation.

14.2 million

Millions of people reached since 2020 about how Ohio natural gas and oil is essential to our daily lives

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by the numbers

469

educators have participated in the workshop program since 2017

Teacher Workshops

STEM and geology teacher workshops provide educators with factual knowledge about the natural gas and oil industry, along with the history, science, and geology behind it. Career connections are incorporated into the curricula to educate students about job opportunities that are available within the natural gas and oil industry. Since 1998, 3,252 educators from all of Ohio's 88 counties have participated in the workshops.

103

classrooms have received a presentation since 2017

Classroom Presentations

Direct engagements with classrooms and students to discuss natural gas and oil history and career opportunities. These presentations are combined with hands on activities to create an interactive and engaging learning experience. They have reached thousands of Ohio students over the years.

\$267k

\$267,000 in scholarships have been awarded through 267 scholarships since 2017

Scholarship Program

Scholarships are provided to promising students with an interest in the natural gas and oil industry. More than half a million dollars has been awarded since the inception of the scholarship program and 326 students from 65 Ohio counties have received an award.

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by the numbers

\$10,150

\$10,150 awarded through 94 State Science Day awards since 2017

State Science Day Awards

A program of the Ohio Academy of Science, State Science Day provides students and teachers an opportunity to highlight students who go above and beyond through scientific, project-based learning. OOGEEP has supported State Science Day by judging energy-based research and projects, and providing monetary awards to Ohio students. Since the organization began presenting awards, 301 awards have been issued to students from 54 counties.

175

firefighters have participated in the program since 2017

First Responder Training

The first of its kind in the nation, this program has provided training to thousands of firefighters and first responders. It is designed to keep communities safe and teach common practices, references and standards used by the fire service and the gas and oil industry. The safety training program includes classroom style learning lessons and industry exclusive hands-on training at the Wayne County Regional Training Facility in Apple Creek, OH. To date, 1,629 first responders from 60 Ohio counties have participated in the program.



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natural gas and oil investment

—in energy education since 2017

\$5,983,709

total invested in natural gas and oil education via the Ohio Oil and Gas Energy Education Program and Ohio Oil and Gas Energy Education Foundation since 2017

Funding

The organization is funded by an assessment paid by natural gas and oil production in the state. The organization also operates a 501(c) (3) foundation, which is funded through donations to support items such as scholarships, state science day awards and other educational opportunities. These investments by Ohio's robust natural gas and oil ecosystem help achieve the mission of statewide educational empowerment.

\$5,694,050

invested in the **Ohio Oil and Gas Energy Education Program** since 2017

\$ 289,789

invested in the **Ohio Oil and Gas Energy Education Foundation** since 2017

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natural gas and oil investment

—in energy education since 1998

\$23,714,962

total invested in natural gas and oil education
via the Ohio Oil and Gas Energy Education
Program and Ohio Oil and Gas Energy Education
Foundation since its inception in 1998*

*As of 12/31/2021

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Investing in Ohio's Communities

OOGA members are proud to partner with organizations and programs that are making a difference across Ohio and beyond.

- ACRES OF ADVENTURE INC
- ASHLAND COUNTY COMMUNITY FOUNDATION
- AVANNAH VOLUNTEER FIRE COMPANY
- Adopt-a-Highway
- Akron Children's Hospital
- American Heart Association
- American Red Cross
- Antioch Alliance Church
- Army Navy Union Garrison 097
- Ashland University
- Ashland County Wildlife Conservation League
- BLOOM CARROLL HIGH SCHOOL

- BUCKEYE HOOK & LADDER
- BUCKEYE RIDGE HABITAT FOR HUMANITY
- Beaver Creek Wildlife Education Center
- Belle Valley Volunteer Fire Department
- Berne Township Fire Department
- Berne Union Music Boosters
- Bi-Con Services, Inc
- Cadiz Blues for a Cure
- Cadiz Food Pantry
- Caldwell Elementary School Science Olympiad
- Caldwell Exempted Village School District
- Caldwell Knight of Columbus

- Caldwell Volunteer Fire Company
- Called to Freedom Fellowship
- Calvary United Methodist Church
- Cambridge City Schools
- Camp Frederick Inc.
- Carroll County Senior Center Nurses
- Carroll County Township Association
- Carroll Livestock Sale
- Central Ohio Joint Fire District
- Central Ohio Youth For Christ
- Children's Hunger Alliance
- Christmas Angel Tree

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Investing in Ohio's Communities

OOGA members are proud to partner with organizations and programs that are making a difference across Ohio and beyond.

Christmas For Kids/Coats For Kids Paulding County
Christmas Gifts for Children
City of Defiance - Fire and Rescue Division
City of East Palestine Office of Treasurer
City of Wellston
Cleveland Clinic Foundation
Clinton Township (Vinton County, OH)
Clyde Green Springs Schools
Columbia Heights Preschool
Columbiana County Emergency Management Agency
Columbiana County Health Dept PPE
Columbus State Community College
Crawford County Agricultural Society
Darby Eades Memorial Scholarship
Deersville Theatre Project
Defiance County Sheriff's Office
Diabetes Youth Services
Ducks Unlimited
Duke Energy Community Relations
EAST CANTON SCHOOLS
EQT Foundation

Earth Angel Foundation of Ohio Inc.
East Union Township
Eastern Ohio Development Alliance
Edison Local Schools Foundation
Elmwood Local Schools
Elmwood Robotics Club
FOODWORKS ALLIANCE LLC
Fairfield Medical Center Foundation
Family YMCA of Lancaster Fairfield Co.
Feeding America
FoodWorks Alliance LLC
Foundation for Appalachia
Franklin County Historical Society
Franklin Township Firefighters Association
Friend of Stark Parks
GOOD SHEPHERD WESLEYAN CHURCH
GREAT TRAIL VFD
Gateway Fellowship Inc.
Georgesville Community Club
Girl Scouts
Good Hope Twp vol. Fire dept Knox Technical Center

Groveport Madison Local Schools
HOCKING COUNTY CHILDRENS CHORUS
Habitat for Humanity
Hanover Township VFD Radios
Harrison Community Hospital Foundation
Harrison County Agricultural Society
Harrison County Military Support Group
Harrison County Tourism Council
Harrison Husky Sports Golf Event Major Sponsor
Hemlock Grove Christian Church
Highland Township Fire Department Association
Highland Township Fire Dept Association
Highland Twp Fire Dept
Hocking Athens Perry Community Action
Hocking County Children's Chorus
Hocking Hills Children's Museum
Hocking Valley Amateur Radio Club
Hocking Valley Community Hospital Foundation
Irondale fire rescue

[MENU](#)

Investing in Ohio's Communities

OOGA members are proud to partner with organizations and programs that are making a difference across Ohio and beyond.

JEWELL VOLUNTEER FIREMENS ASSOCIATION INC
Jefferson County Educational Services Spelling Bee
Jefferson County Health Department
Jefferson County NWTF
Jefferson County Township Association
Jefferson Livestock Sale
Jeromesville Community Fire District
Jewett Community Center
Jewett Food Pantry
Junior Leadership Columbiana County
LIVE HEALTHY APPALACHIA
LOGAN-HOCKING CHAMBER FOUNDATION
LOVE YOUR NEIGHBOR NON PROFIT
Lake and Trails Organization
Lancaster-Fairfield County 4th of July Committee, Inc
Lexington Police Department
Liberty Township Volunteer Fire Department & Rescue Unit Inc
Live Healthy Appalachia
Laurelville Volunteer Firemans Association
Logan Hocking Schools/Project SAFE
Loudon Township Carroll County

Loudonville FFA
Louisville Police Department
Louisville Warm Coats
MWCD Foundation
Mahoning County Hazmat
Mapleton Local School District
Maumee Valley Habitat for Humanity
Mercy Medical Center Foundation
Mid-East Career and Technology Centers
Mid-Ohio Food Collective
Middleport Cub Scout Pack 777
Mifflin Township Fire Department
Mohican State Park
Monroe Township Lucas Fire Department
Mount Vernon Nazarene University
NOBLE TOWNSHIP VOLUNTEER FIRE DEPARTMENT
NORTH CENTRAL OHIO LAND CONSERVANCY INC
Nelsonville Division of Fire
Nelsonville-York City Schools
New Middletown Police Department
New Pittsburg Fire and Rescue Association Inc.

Noble County Junior Fair Board
Noble County Pool
Noble County Sherriff's Office
Noble Township Volunteer Fire Department
OH WOW!
OHIO WILDLIFE REHABILITATORS ASSOCIATION
ONTARIO YOUTH SPORTS INC
Oak Hill Festival of Flags
Oak Hill Union Local School District
Oakwood Fire and EMS
Oakwood Volunteer Fire Department
Ohio FFA Camps
Ohio Gas Association Scholarship Foundation
Ohio Oil & Gas Energy Education Program (OGEEP) Foundation
Ontario Youth Sports
PM Gillmor Community Park
Paint Township Fire and Rescue
Paulding County EMA
Perrysville Firefighter's Association
Playground Builders
Pleasant Township Trustees

[MENU](#)

Investing in Ohio's Communities

OOGA members are proud to partner with organizations and programs that are making a difference across Ohio and beyond.

Polk Jackson Perry Fire District
Rejoicing Life Church
Richland County Emergency Management Agency
SEVILLE-GUILFORD FIRE ASSOCIATION
STAR TOWNSHIP VOLUNTEER FIRE DEPARTMENT INC
Saline Township EMS
Sally Buffalo Park Playground & Community Day
Sardis Volunteer Fire Department, Inc.
Seville-Guilford Fire Association
Sheriff Williams Carroll Count
South Central Fire District
South Point Local School District
South Richland VFD Association
South Richland Volunteer Fireman's Association
Southeast Ohio Foodbank (HAPCAP)
Southern Local School District
Southern Wayne Advisory Council, Inc. S
Springfield Police Department
Springfield Township Fire Department
Springfield Youth Soccer Association (SYSA)
Stark County Sheriff

Stark Economic Development Corporation
SueAnn Hooks- Paraprofessional
The Challenge Program
The Oak Hill Festival of Flags Committee
The Salvation Army
Tiffin Township Fire Department
Toys For Tots
Trinity Health
Triway Local Schools
Troop 299 Hemlock Grove Christian Church
Truth Food Pantry, Inc.
United Way
Urban Mission
Village of Belle Valley
Village of Butler - Butler Police Department
Village of Caldwell
Village of New Waterford
Village of Payne
Vinton County Local School District
Ironton School Board
Vinton County Sheriff's Department

Vinton SWCD
Vinton Soil and Water Conservation District
WAYNE COUNTY FIRE AND RESCUE ASSOCIATION
WOOSTER TOWNSHIP FIRE AND RESCUE ASSOCIATION
Washington Township Fire Department
Wells Township PD
West Holmes Cafeteria
West Holmes Local Schools
Western Holmes County Fire District
Western Reserve Joint Fire District
Wintersville Volunteer Fire Department
Women for Economic and Leadership Development (WELD)
Worthington TWP
YOUTH OPPORTUNITIES UNLIMITED
York Township Fire Department
Youngstown Chamber Foundation
ZANE STATE COLLEGE FOUNDATION
Zane State College
Zanesville Middle School

[MENU](#)

making an impact

2022 COMMUNITY IMPACT / SUSTAINABILITY REPORT



[MENU](#)

Exhibit "C"

Attached to and made a part of that certain Nomination of State-Owned Lands
Letter dated May 30, 2023, Parcel 15-0000935.000, Carroll County, Ohio

- Muskingum Watershed Conservancy District (MWCD) 2021 Annual Report
- Muskingum Watershed Conservancy District (MWCD) 2021 Audit Report



**MUSKINGUM
WATERSHED**
CONSERVANCY DISTRICT

Annual Report of Operations

www.mwcd.org



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MESSAGE FROM EXECUTIVE DIRECTOR

The Muskingum Watershed Conservancy District (MWCD) had a record-breaking year in 2021! From revenues and visitors to programming and awards, we broke records in every category. Our 2021 Annual Report will highlight many of these accomplishments, but I am excited to share a few successes with you. We had over 4 million visitors choose our parks and lakes as their recreational destination in 2021, an increase of 5 percent from 2020. Our camping and cabin rentals also increased by 8 percent and 23 percent respectively, exceeding our 2021 budget goals. Our operating revenues were up over 30 percent from 2020 and we offered more programs, activities, and events than ever before.

Over the past two years, we increased marketing and outreach on all media platforms and these efforts did not go unnoticed in 2021. MWCD received recognition and awards from the Ohio Travel Association and other organizations, honoring our successful advertising and public relations campaigns.

We continue to see new visitors at MWCD parks, lakes, marinas, and trails. We are thankful to be able to provide unique and safe outdoor opportunities for visitors to relax and reconnect with family, friends, and nature. We have made significant progress to the Master Plan renovations completing nearly \$200 million in investments at all our facilities. From rebuilding critical infrastructure to upgrading camping facilities and adding amenities like WhoaZone and others that are still in the works, visitors are letting us know they wholeheartedly approve of what we are doing. We have a team that makes this construction planning and management look easy, but I hope you can appreciate how complex and challenging this work is and can appreciate the results.



As we add new features, we remain focused on maintaining our original assets. Our lakes, shorelines, and dams are in constant need of maintenance. We continue to dredge and remove sediment from key areas, as well as improve shorelines in need of repair. Additionally, we highly value our relationship with the U.S. Army Corps of Engineers to make critical upgrades and repairs to the dams. Through this shared responsibility, we ensure MWCD is faithful to its original mission of protecting the residents of the Muskingum River Watershed from devastating flooding. Without maintaining these dams and levees, none of the other activities we do would be possible.

Investing in the communities located within the watershed is a priority for MWCD. Last year we provided over \$1.5 million to 18 projects in 13 counties to improve local communities and the watershed. From hellbender salamander research, invasive species control, and agriculture improvements to critical infrastructure repairs due to landslides, the MWCD Partners in Watershed Management (PWM) program was often the critical source of funds to make these projects happen. Since 2009, this program has been a vital source of funds for agencies, communities, and groups involved in conservation programs, water quality, and flood reduction and mitigation projects within the watershed. The PWM program affirms MWCD's mission to prevent flooding and enhance water conservation efforts, improving the quality of life for residents.

We are also looking to the future and are working to improve the organization. Our three-fold mission is to focus on flood control, recreation, and conservation. We clearly excel at the first two and are ready, now, to develop a strategic direction and program focused on conservation and sustainability. The most noticeable move in this



direction was to restructure an executive position – Chief of Conservation – to build a strong program within MWCD and with all our conservation partners in the public and private sector.

It is time for MWCD to update its overall 5-year strategic plan. We were excited to start the process of our next strategic plan in 2021 and we look forward to developing a clear vision to honor our past, maintain the present, and plan for the future in 2022.

As I wrap up my introduction to this year's Annual Report, I cannot help but leave you with the words of MWCD founder Bryce Browning. These words are from a speech he gave as the Conservancy District was formed and, frankly, brings tears to my eyes.

“We had a vision. We studied, planned, and worked to make it a reality. Strong leaders developed from among us. We followed them through the difficult days when discouragement made the vision seem dim and the goal, very far away. The Muskingum Valley today is a living thing. It is the growing trees and grasses. The fish and wild animals. The fertile fields responding to the changing season. The living waters. It is the people and the hopes and aspirations of generations, yet unborn. On this good land, full and abundant, there is life. It is a happy place. But our story does not end here. It will never end. Once a vision is born it can never die. The vision grows and the people grow with it. But come. See it for yourself.”

– Bryce Browning
MWCD Founder

These words reflect pride in the accomplishment of establishing the Conservancy District. Moreover, to me they reflect the hope that the Conservancy District can and will change the lives of many in the Muskingum River Valley.

Come see us. Grow with us. Be part of our vision.

Craig W. Butler
Executive Director

CONSERVANCY COURT

Ashland County

Honorable Ronald P. Forsthoefel

Belmont County

Honorable John A. Vavra

Carroll County

Honorable Michael V. Repella, II

Coshocton County

Honorable Robert J. Batchelor

Guernsey County

Honorable Daniel G. Padden

Harrison County

Honorable T. Shawn Hervey

Holmes County

Honorable Sean M. Warner

Knox County

Honorable Richard D. Wetzel

Licking County

Honorable Thomas M. Marcelain

Morgan County

Honorable John A. Wells

Muskingum County

Honorable Mark C. Fleegle

Noble County

Honorable Kelly A. Riddle

Richland County

Honorable W. Steve McKinley

Stark County

Honorable Jim D. James

Summit County

Honorable Amy Corrigan Jones

Tuscarawas County

Honorable Michael J. Ernest

Washington County

Honorable Mark Kerenyi

Wayne County

Honorable Latecia E. Wiles

BOARD OF DIRECTORS



James M. Gresh
Term Expires in 2022



Joanne Limbach
Term Expires in 2023



Gordon T. Maupin
Term Expires in 2024



Clark E. Sprang
Term Expires in 2025



Robert S. Moorehead, Jr.
Term Expires in 2026

BOARD OF APPRAISERS



Mark J. Waltz
Term Expires in 2023



Tracy Reiss
Term Expires in 2024



John F. Ginikos
Term Expires in 2025

EXECUTIVE STAFF



Craig W. Butler
Executive Director/Secretary



Boris E. Slogar
Chief Engineer



Adria L. Bergeron
Director of Marketing and
Communications



Mary C. Burley
Director of
Human Resources



James L. Crandall, III
Chief Financial Officer/
Treasurer



Bradley P. Janssen
Chief of Natural Resources
and Land Management



J. Ryan McCleaster
Chief of Recreation



Jonathan C. Mizer
Chief Legal Counsel



Matt A. Thomas
Chief of Conservation

DEVELOPMENT ADVISORY COMMITTEE

In 2021, under the leadership of the Executive Director, the DAC provided public input, feedback, and advice related to trails, revenue, marketing, and legislative matters.

Matt Abbott
New Concord

Bob Alsept
New Philadelphia

Scott Arnold
Mansfield

Trevor Dunlap
Perrysville

Ronald Dzedzicki
Medina

Alfred Fearon
Bolivar

Karl Gebhardt
Westerville

Chris Jacobs
Scio

Marty Larsen, Jr.
Mansfield

Ed Lee
New Philadelphia

John Lofgren
Uniontown

Dana McDaniel
Dublin

Luke Messinger
Gahanna

Joy Padgett
Coshocton

Dave Pilcher, Sr.
New Philadelphia

A. Bruce Robinson
Scio

Jackie Stewart
Louisville

Steve Walker
Navarre

John Wirtz
Sherrodsville



BUILDING VIABLE PROGRAMS ON THE FIRM FOUNDATION OF A RECORD-BREAKING YEAR

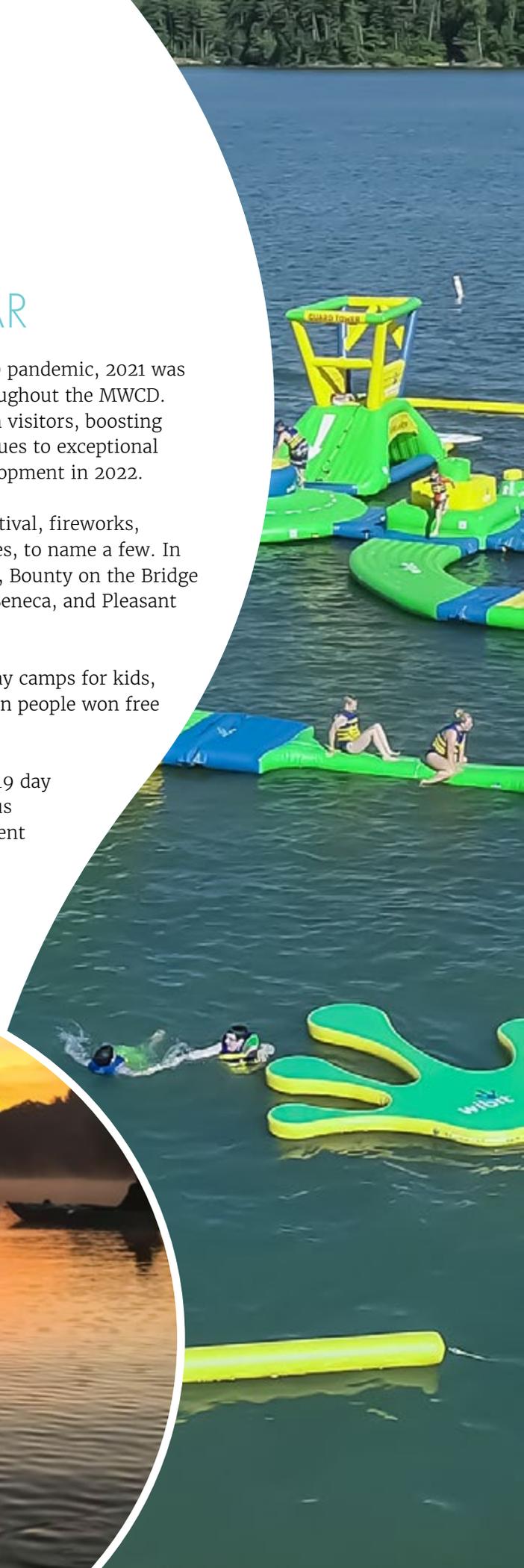
After a year of fewer and smaller events in 2020 due to the COVID-19 pandemic, 2021 was filled with the happy smiles of visitors and staff at many events throughout the MWCD. In fact, 2021 brought record numbers in many areas ... over 4 million visitors, boosting reservation totals to new highs and, in turn, helping to elevate revenues to exceptional levels. All of which helps to form a firm basis for new program development in 2022.

2021 saw the return of the Alive Music Festival, Atwood Area Fall Festival, fireworks, Halloween events, Princess in the Park, and Hunter Education Courses, to name a few. In addition, new events included Halloween Weekend at Piedmont Lake, Bounty on the Bridge at Atwood Lake Park, and First Responders Day at Atwood, Tappan, Seneca, and Pleasant Hill Lake Parks.

More participants than ever before enjoyed guided kayaking tours, day camps for kids, Ladies' Night crafts, guided hikes, and Movies at the Lake. Plus, seven people won free kayaks at our Poker Paddles!

In 2021, staff also planned and implemented 38 guided kayak tours, 19 day camps for kids, 33 Movies at the Lake, and six fireworks displays, plus numerous other events each week throughout the year. Estimated event attendance was 14,250 participants, not including fireworks events.

As part of our effort to constantly expand and improve programs and facilities, WhoaZone inflatable obstacle courses were opened at Atwood and Pleasant Hill Lake beaches. The inflatable obstacle courses are designed to provide safe, challenging, water-based adventure for beach-going families, and proved to be very popular in 2021.



Program Success Boosts Operating Revenues

Park and marina financial performance exceeded budget goals with operating revenues up over 30 percent – \$3.2 million – from \$10,611,328 in 2020 to \$13,823,825 in 2021. In addition, operating income (revenues minus expense) for parks and marinas increased by \$2.7 million – from \$2,529,476 in 2020 to \$5,319,784 in 2021.

Occupancy continued to show growth with cabin occupancy up 23 percent — from 5,778 nights in 2020 to 7,125 nights in 2021. Camping nights increased by 8 percent from 358,836 in 2020 to 388,716 in 2021.

2021
OPERATING REVENUES
+30%

LAKE ATTENDANCE ESTIMATES

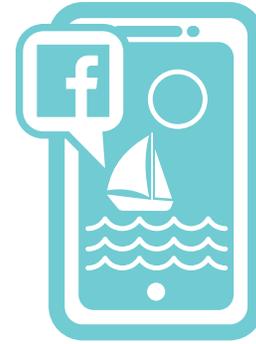
MWCD Location	2021 Attendance	2020 Attendance	% Change
Atwood	975,697	962,310	1.39%
Charles Mill	665,805	601,918	10.61%
Pleasant Hill	562,938	532,525	5.71%
Tappan	735,215	713,390	3.06%
Seneca	954,313	875,582	8.99%
Subtotal Parks	3,893,968	3,685,726	5.65%
Piedmont	204,520	200,389	2.06%
Clendening	36,987	39,172	-5.58%
Subtotal Marinas	241,507	239,561	0.81%
Grand Total	4,135,474	3,925,287	5.35%

PARK AND MARINA REVENUES

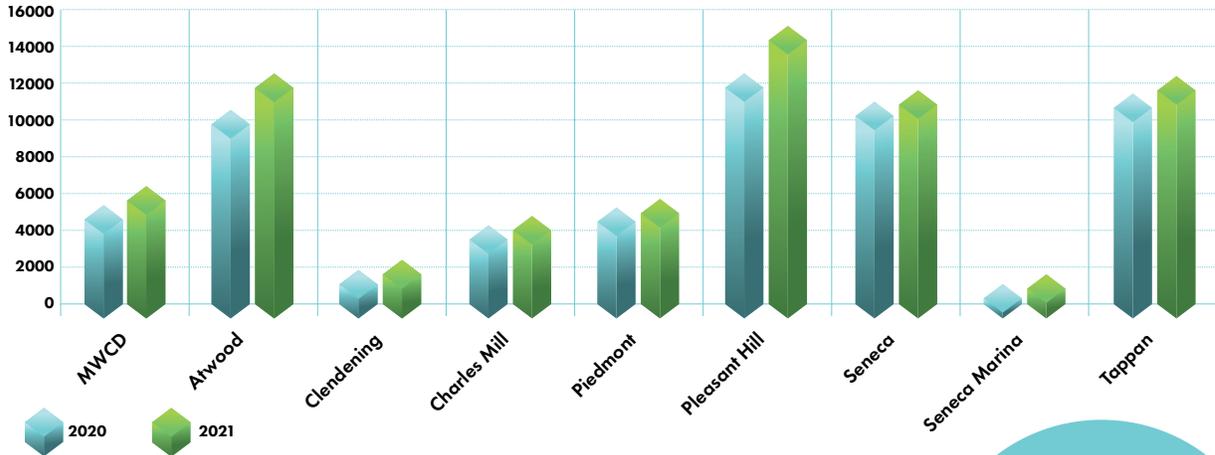
MWCD Location	2021 Revenue	2020 Revenue	% Change
Atwood Lake Park	\$ 3,158,567	\$ 2,415,043	31%
Charles Mill Lake Park	1,301,278	851,229	54%
Clendening Marina	601,338	599,418	0%
Leesville Campground	126,557	105,809	20%
Piedmont Marina	841,216	726,053	16%
Pleasant Hill Lake Park	1,960,070	1,426,358	37%
Seneca Marina	741,078	676,031	10%
Seneca Lake Park	2,250,329	1,507,128	49%
Tappan Lake Park	1,801,160	1,484,190	21%
Tappan Marina	498,931	579,560	-14%
Leased Marinas	539,936	528,826	2%
Grand Total	\$ 13,820,460	\$ 10,899,645	24%

Marketing Success Earns Recognition

The success of MWCD marketing activities earned recognition and awards from the Ohio Travel Association and other organizations, honoring our advertising and public relations strategies and efforts. In addition to traditional print, radio, and television media, our current program also uses contemporary approaches involving social media, with a recent introduction to Instagram, producing the following results:



FACEBOOK FOLLOWERS



WEBSITE TRAFFIC
15,000
Average
Monthly Visitors



Rangers Respond to 10,774 Calls

During 2021, MWCD Rangers issued a variety of violations and completed 100 Incident Reports. The Rangers stayed extremely busy throughout the year and accomplished a great deal with limited staffing, resulting in these highlights:

- 10,774 Calls Entered
- 5,280 Campground and Marina Checks
- 2,619 Cottage and Outlying Area Checks
- 113 Vessel Safety Checks
- Only 10 Critical Incidents

Employment Totals 119 Full-Time, 176 Seasonal/Variable

MWCD employed 119 people full-time in 14 different facilities in eight counties during 2021. Another 176 seasonal/variable employees worked during the recreational season.

The continued impacts of COVID-19 required all MWCD employees to go above and beyond their normal job duties to ensure the safety of not only MWCD employees, but guests and campers as well. The Human Resources office coordinated two on-site COVID-19 vaccine clinics for employees and their immediate family members conducted by local health departments. Other activities included:

- 16 Full-Time Positions Filled in 2021
- 10 Locations with No Recordable Injuries
- 17 Staff Trained in First Aid, CPR, and AED
- 38 Staff Trained in Cold Water Readiness
- 51 Staff Completed Fire Extinguisher Training



Programs and Operations Focused on Quality of Life

MWCD is dedicated to not only improving existing amenities but also adding new opportunities that satisfy a wide variety of interests and abilities to encourage more people to participate in outdoor recreation at MWCD parks and marinas.

Focusing on more than just updating facilities, the Master Plan has allowed us to take advantage of the national rise in outdoor recreation to create a positive impact on quality of life.

These facilities and amenities will become a model for outdoor recreation, and the results will leave a legacy for future generations to enjoy the benefits of recreation in the Muskingum River Watershed.





MASTER PLAN LEADS THE WAY TO SIGNIFICANT IMPROVEMENTS THROUGHOUT THE DISTRICT

The MWCD Park and Marina Capital Improvement Plan, also referred to as the Master Plan, is the road map resulting in the most significant upgrades to our recreational facilities in a half century. Priorities were identified through public work sessions, gathering input from our customer base, and benchmarking national trends in recreation.

MWCD customers indicated that their No. 1 priority in capital improvements was to upgrade campsites and the infrastructure that serves the campers. In many instances, 50-year-old electrical, water and sewer systems serving the campsites could not accommodate today's larger and modern camping units. Modern units also require more space and parking for vehicles, and hard surfaces for leveling and ease of maintenance. The focus of engineering planning and design has been to upgrade the campsites to meet these camper-driven priorities.

On July 19, 2019, the Board of Directors approved Phase 2 of the Master Plan including about \$45 million for park improvements and about \$20 million marina improvements. Included in these amounts is nearly \$11 million earmarked for improved amenities, which may include additional playgrounds, spray grounds, sports courts, and fiber optic for improved communication, prioritized through research, online surveys, and focus group meetings.

Phase 2 of the plan expanded the program to include Clendening Marina and Campground, Leesville North Fork Marina, Leesville South Fork Campground, and Tappan Marina which were all acquired since the inception of the Master Plan. The implementation strategy for the marinas in Phase 2 is to focus on infrastructure first, followed by camping and waterfront improvements.

Over \$195 million has been committed to this Capital Improvement Program to upgrade the parks and campgrounds, funded with revenues reserved from oil and gas leases.

During 2021, MWCD delivered almost \$10 million in capital projects. The following were constructed or under construction during 2021:

Atwood

- WhoaZone
- Main Campground Improvements – Phase 2
- West Marina Showerhouse/Restroom Rehabilitation
- Cemetery Bay Trail
- Woodland Trail

Charles Mill

- Main Campground Redevelopment – Phase 3

Leesville

- North Fork Marina Fuel Service Upgrade

Piedmont

- Water Treatment Plant

Pleasant Hill

- WhoaZone
- New Campground Area G
- RV/Boat Storage Lot
- Cabin Landscaping
- Cabin Roadway and Toad Road Paving

Seneca

- Marina Point Campground Redevelopment – Phase 2
- Marina Shoreline Stabilization, Deck Replacement and ADA Site Access

Tappan

- Marina Renovations
- Marina Wastewater Treatment Plant and Sanitary Improvements
- Marina WWTP Emergency Generator
- East Campground Pumps Station Emergency Generator





Tappan Marina Takes a Major Step Forward

The \$6-million Tappan Marina and restaurant building renovation project includes a new 250-seat restaurant on the main floor, including seating for over 100 guests on a covered deck overlooking the lake.

“We are very excited to provide a full-service restaurant and bar where boaters and visitors can enjoy a delicious meal, in a comfortable, relaxing environment with a spectacular view!” said Shari Lewis, who is operating the Waters Edge Kitchen + Bar restaurant along with Matt Donohoe.

The lower level of the marina is home to MWCD’s Tappan Marina operations with pontoon and fishing boat rentals, boating supplies, gifts, bait and tackle, fuel sales, snacks and docking rentals.

“Tappan Lake is very popular for boating and fishing and draws guests from Ohio and surrounding states. The new design will provide a premier destination that will offer an inviting gateway to the Tappan Lake region.”

This project also includes construction of new asphalt driveways, asphalt paving of the parking lot, new concrete sidewalk along the shoreline, two sets of steps for dock access, three new dock abutments, 350 feet of shoreline improvements, and lighting of the parking lot and steps. It will also provide 126 parking spaces. The site also features elements of green infrastructure, including storm water management and vegetative filter strips to protect the water quality of Tappan Lake, and the use of geothermal energy to reduce utility costs.

Photo: © Andrew Dolph / Times-Reporter

“The renovations to Tappan Marina have not only beautified the facility, but more importantly, allow us to better serve our guests,” said Ryan McCleaster, MWCD Chief of Recreation.





Trail System Continues Enhancement

The MWCD has featured trails since the development of our recreational facilities began in the 1950s, recognizing that hiking trails make our communities more livable. They connect us to our neighbors, businesses, places of interest, and even our jobs.

Trails improve the economy through tourism and civic improvement, preserve and restore open space, increase property values, and provide opportunities for physical activity to improve fitness and mental health. As such, MWCD is committed to continuing to provide sustainable trails for our visitors, neighbors, and partners.

As part of that commitment, the MWCD has a strong, ongoing partnership with the Buckeye Trail Association (BTA). Established in 1959, the nationally known 1,444-mile Buckeye Trail circles Ohio and includes connections near Atwood and links between Seneca, Piedmont, Clendening, Tappan, and Leesville Lakes. The Tappan Lake area is also home to the BTA's Century Barn.

The MWCD has also seen increases in the popularity of the 37 miles of hiking,

biking, and equestrian trails on its own 57,000 acres of land, much of it open for public access. Atwood, Charles Mill, Pleasant Hill, Seneca, and Tappan Lake Parks have numerous self-contained loop trails.

The MWCD is also proud to have several designated water trails on the Kokosing, Mohican, Muskingum and Tuscarawas Rivers.

Cooperating with the Ohio Horseman's Council, an equestrian camp area and trail system has been developed in the Pleasant Hill region, adding three miles of trail to areas of Malabar Farm State Park and Mohican State Forest and Park for a total of 27 miles of trail.

In 2021, MWCD continued its commitment to trail improvement and development by completing the Woodland Trail extension project at Atwood Lake Park. Additionally, MWCD hired a trails coordinator and created a trails technician position, who will work to expand trails, improve the trails support team, and develop relationships with trail partners.

Reservoir Maintenance Programs Continue

MWCD manages two main reservoir maintenance programs: dredging and shoreline protection.

Dredging continued at Seneca Lake again in 2021, resulting in the removal of about 63,000 cubic yards of sediment from areas near the Churchman Point Docking Association and Kennonsburg Boat Club, bringing the total volume of material dredged to over 85,000 cubic yards.



Atwood Lake – Dredging at North Shore Cottage Area



Additionally, a small excavation dredging project at Atwood Lake was completed at the North Shore Cottage Area, resulting in the removal of about 3,400 cubic yards of sediment.

2021 Shoreline Protection Projects

In 2010, a study of MWCD's 300 miles of shoreline was conducted to identify stabilization needs at 10 MWCD reservoirs. As a result, over 9.5 miles of shoreline stabilization work has been completed over the past 11 years at a cost of about \$11.5 million.

Six shoreline stabilization projects were completed in 2021 at a cost of approximately \$440,000.



**Atwood North Shore
Cottage Area**



Atwood Lake Beach



Atwood Glens - Anchor Lane



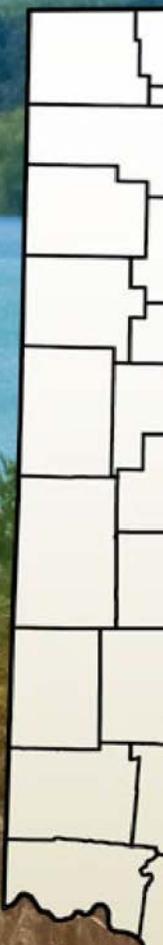
Atwood Glens - Cherry Lane



**Seneca Churchman
Point Phase 2**



**Pleasant Hill Loudonville
Wildlife Club Area**





PARTNERSHIP PROGRAMS FURTHER COMMUNITY ENGAGEMENT EFFORTS

MWCD developed the Partners in Watershed Management Project Assistance Program in 2009 to support the work of agencies and groups involved in conservation programs, water quality issues and flood reduction and mitigation projects, supporting the various aspects of the mission of the MWCD.

Since the program was launched, over \$10 million has been awarded to 156 projects. In 2021, 18 projects in 13 counties were awarded a total of \$1,544,991 in grants in the following counties.



2021 Partners in Watershed Management Projects

Manure Application Tools for Small/Hobby Farms

APPLICANT: Ashland Soil Water Conservation District (SWCD)
COUNTY: Ashland
APPROVED GRANT: \$6,000

PROJECT DESCRIPTION

Ashland SWCD proposed purchasing a small manure spreader and transport trailer to be used throughout Ashland, Holmes, and within the MWCD's jurisdictional area of Richland counties. The spreader would be made available for rent by farmers to reduce manure and nutrient runoff throughout the watershed. Rental fees would be used for equipment upkeep, maintenance, and replacement to make the program self sustaining.

Project Soil Health Toolbox

APPLICANT: Carroll Soil and Water Conservation District (SWCD)
COUNTY: Carroll
APPROVED GRANT: \$60,000

PROJECT DESCRIPTION

Carroll SWCD requested funds to purchase a lime spreader and roller crimper for a cover crop program in Carroll County. This grant will expand soil testing for farmers and allow them to apply agricultural lime according to the results of the soil tests. The roller crimper will allow farmers to produce an alternative way to terminate cover crops without the use of herbicides or tillage.

South Barberton Green Infrastructure, Phase 1

APPLICANT: City of Barberton
COUNTY: Summit
APPROVED GRANT: \$70,000

PROJECT DESCRIPTION

The City of Barberton is working with the State of Ohio, Ohio Emergency Management Agency, and regional and local entities to alleviate flooding in this area and within their portion of the Tuscarawas River Watershed. Creation of a singular large flood control structure will be detrimental to neighborhood cohesion. Rather, the city proposes a series of neighborhood-building green infrastructure flood control elements throughout the watershed. The city has preliminarily identified five green infrastructure projects to reduce localized flooding and retain regional stormwater from further exacerbating flooding downstream.

This application will provide partial design and construction dollars for this first phase green infrastructure element, which is located within MWCD's jurisdictional boundary. Phase 1 will install an oxbow wetland and in-stream grade structures on an existing property owned by the City of Barberton. The oxbow wetland and stream project will help store nearly 2 acre-feet of regional stormwater, which will lower the 10-year flood elevation for downstream properties and roadways.

Muskingum Avenue Improvements (Muskingum River)*

APPLICANT: City of Zanesville
COUNTY: Muskingum
APPROVED GRANT: \$500,000

PROJECT DESCRIPTION

The City of Zanesville requested funding to stabilize a substantial landslide along the Muskingum River which has forced the closure of Muskingum Avenue (Dug Road). The project will minimize and prevent further earth and debris slippage into the Muskingum River by stabilizing the land slippage of the roadway and cutting back the upper hillside to prevent rock falls and sediment that will impact the Muskingum River.

Also, the project includes provisions to add a 30-inch conduit under Muskingum Avenue to relocate the aging existing 24-inch wastewater force main currently located along the south edge of the Muskingum River whereas the existing force main is old and susceptible to damage from flood scour, erosion, and landslides. A break in the force main will result in large quantities of wastewater spilling into the Muskingum River and result in over 9,000 households and business being affected by the outage.

**This project was approved by the MWCD Board of Directors and is contingent upon applicant receiving other sources of grant funding for their project.*



Clark Township: Township Rd. 25 Bridge Replacement (Tributary to Killbuck Creek)

APPLICANT: Coshocton County Engineer
COUNTY: Coshocton
APPROVED GRANT: \$85,000

PROJECT DESCRIPTION

This project requested funding for reimbursement costs associated with the replacement of a structure over Hoagland Run with a 20-foot x 16-foot galvanized bridge. Profile adjustments were made to the road in conjunction with the installation which has allowed the road to remain open longer when Hoagland Run tops its banks and floods the area. The section of the road between State Rt. (SR) 60 and Township Rd. (TR) 321 is the only route that allows for ingress and egress to SR 60 during a flooding event. Without this structure, emergency services and the traveling public would have a substantial detour around the flooded area to get to any residences that are located on TR 321 and other various township roads connected to it.

Flood Mitigation Feasibility Study (Muskingum River)

APPLICANT: Morgan County Commissioners
COUNTY: Morgan
APPROVED GRANT: \$84,000

PROJECT DESCRIPTION

The Morgan County Commissioners requested funds to conduct a Feasibility Study for protection of flooding areas along the Muskingum River. The County intends to apply for funding through the Federal Emergency Management Agency Building Resilience in Communities (BRIC) program. The BRIC application requires a 25 percent local match, which is the portion being requested through the PWM program. Through the proposed study, the county will identify alternatives to mitigate the flooding along the Muskingum River corridor in the Village of McConnellsville along State Route (SR) 60 and adjacent to the Morgan County Fairgrounds along SR 376.

Soil Health Initiative

APPLICANT: Harrison Soil and Water Conservation District (HSWCD)
COUNTY: Harrison
APPROVED GRANT: \$35,000

PROJECT DESCRIPTION

The program provides producers with access to free soil tests for eligible producers for a determined number of acres. The soil tests can be taken by the producer, or by the staff of HSWCD. Equipment will be available to borrow to pull the samples. A lime spreader will be available for rent to apply the appropriate amendments to the soil. The lime spreader will be available to all Harrison County producers to rent, but a discount will be available for producers who have a recent soil test and for those farming in the Muskingum River Watershed.

Watershed Protection Along the Clear Fork

APPLICANT: North Central Ohio Land Conservancy (NCOLC)
COUNTY: Richland
APPROVED GRANT: \$20,000

PROJECT DESCRIPTION

NCOLC requested PWM grant funding for its Healing Land and People Program along the Clear Fork Valley Scenic Trail in Richland County along land owned either by the Richland County Park District or NCOLC. Using labor and hand tools, non-native invasive species will be removed along with the installation of erosion control structures. To accomplish this work, NCOLC hires and trains recovering drug addicts, convicted felons, and their young adult children.

Comanita Property Acquisition (Tuscarawas River)*

APPLICANT: Northern Tuscarawas Land Trust (NLT)
COUNTY: Tuscarawas
APPROVED GRANT: \$290,000

PROJECT DESCRIPTION

NLT requested funds to acquire 185 acres of land adjacent to the Tuscarawas River and downstream of Dover Dam to conserve this property and place deed restrictions to prohibit construction and development, and to become part of Camp Tuscazoar property.

**This project was approved by the MWCD Board of Directors and is contingent upon applicant receiving other sources of grant funding for their project.*

Hellbender Salamander Water Quality Monitoring and Breeding Habitat

APPLICANT: Rural Action
COUNTY: Coshocton
APPROVED GRANT: \$50,000

PROJECT DESCRIPTION

Rural Action requested funds for the Hellbender Salamander water quality monitoring and breeding habitat improvement project. The goal of this project is to enhance the conservation status of Eastern Hellbenders in the Walhonding River Watershed and contribute information on Hellbender population and reproductive ecology. Specifically, the project will (1) gain insight on limiting water quality factors associated with Hellbender population success, (2) use artificial nest boxes to improve habitat and monitor Hellbender populations, and (3) increase engagement with stakeholders including landowners and the Ohio Hellbender Partnership.

Flood Damage Reduction Planning

APPLICANT: South Licking Watershed Conservancy
District (SLWCD)
COUNTY: Licking
APPROVED GRANT: \$200,000

PROJECT DESCRIPTION

SLWCD requested funds to prepare a planning study to identify measures and funding requirements pertaining to flood damage reduction and environmental protection for the portion of the South Fork Licking River Watershed within SLWCD boundaries. The planning study and findings will serve as the basis for updating the Official Plan for the SLWCD, which is based on a 1980 study and addendums. The planning study will also identify measures for inspecting and maintaining stream channels within the SLWCD boundary, for the purpose of preserving the flood carrying capacity and preventing large-scale channel bank erosion.

South Fork Licking River Debris

APPLICANT: City of Heath
COUNTY: Licking
APPROVED GRANT: \$48,400

PROJECT DESCRIPTION

The City of Heath requested financial assistance for 46 locations of debris removal along the South Fork Licking River.

Jerome Fork Log Jam Removal

APPLICANT: Ashland SWCD
COUNTY: Ashland
APPROVED GRANT: \$1,712

PROJECT DESCRIPTION

Ashland SWCD requested financial assistance for the removal of log jams along the Jerome Fork Creek.

Photo: Brian Gratwicke, via Flickr.
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Pittman Park Log Jam

APPLICANT: Bethlehem Township
COUNTY: Stark
APPROVED GRANT: \$34,000

PROJECT DESCRIPTION

Bethlehem Township requested financial assistance in the removal of a log jam at Craig Pittman Memorial Park.

Wills Creek-Moore Log Jam Removal

APPLICANT: Guernsey County Community Development Corporation (CDC)
COUNTY: Guernsey
APPROVED GRANT: \$14,904

PROJECT DESCRIPTION

Guernsey County CDC requested financial assistance in removing a log jam in Wills Creek.

Coshocton County Various Sites Debris Removal

APPLICANT: Coshocton County Engineer
COUNTY: Coshocton
APPROVED GRANT: \$27,100

PROJECT DESCRIPTION

Coshocton County Engineers requested financial assistance in removing six debris removals located in Coshocton County.

Lake Fork Log Jam Removal

APPLICANT: Ashland SWCD
COUNTY: Ashland
APPROVED GRANT: \$13,375

PROJECT DESCRIPTION

Ashland SWCD requested financial assistance in removing a log jam from Lake Fork.

Successful Cover Crop Program Continues

Through the cooperative working agreement between MWCD and the Ohio Department of Agriculture and partnering with the soil and water conservation districts within the watershed, landowners applied for assistance to plant cover crops on 55,193 acres. Through a review and ranking process, 41,817 acres were approved for the program and 33,539 acres were planted on 305 individual properties.

The program keeps a green growing crop throughout the year that protects the soil from erosion, retains moisture, holds nutrients for the next crop, and helps with soil health and water quality.

To date nearly 200,000 acres have been planted, with a total of over \$2.7 million dollars allocated since 2012.

Other Best Management Practices under this partnership initiated in 2021 included assistance for livestock exclusion fencing, education and outreach opportunities, critical area seedings, field buffers, and nutrient management planning.





Support Ongoing for Carroll and Harrison County SWCDs

MWCD supports a watershed specialist through the Carroll and Harrison SWCD offices. These counties hold four MWCD lakes on the eastern side of the district.

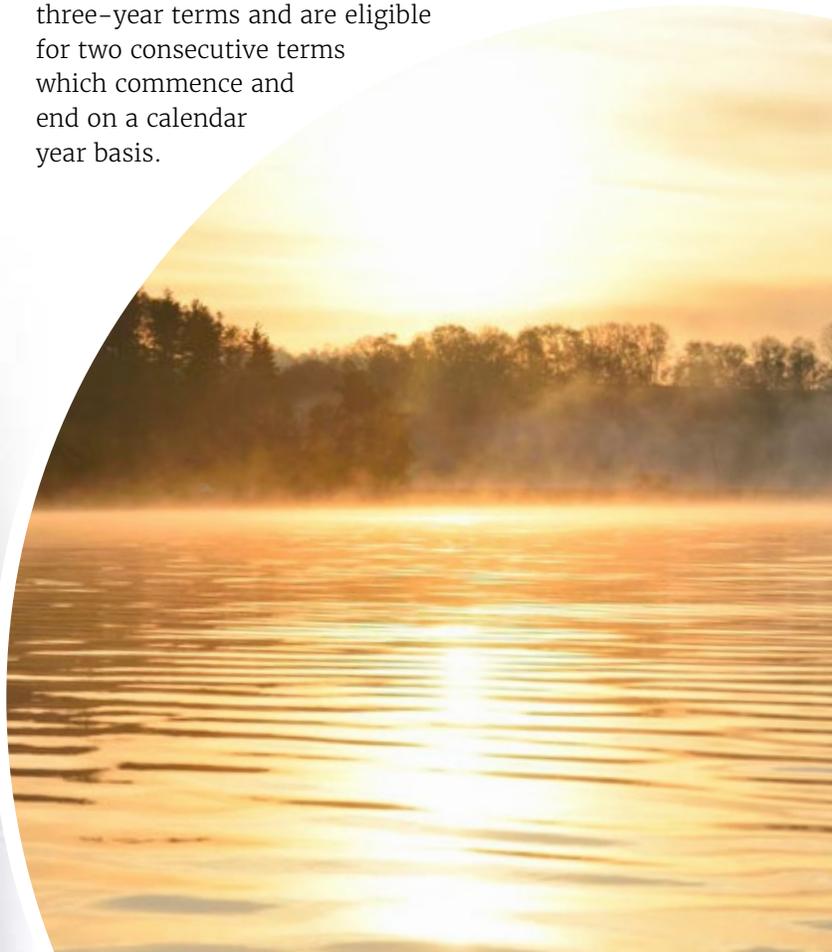
The watershed specialist monitors the water quality of the headwater streams of the lakes, assists local producers with best management practices and technical assistance, and promotes watershed education throughout the counties. The position also coordinates with local stakeholders and assists with programs and water quality projects within the watershed.

In 2021, the watershed specialist applied for two Partners in Watershed Management Grants on behalf of the two SWCDs and both grant applications were funded.

DAC Provides Public Support, Input

The Development Advisory Committee (DAC), created in 1992 to provide advice and guidance on economic development, conservation, and recreation programs, was realigned under the leadership of the Executive Director in 2021.

Appointments to the DAC reflect broad geographic representation and a diversity of interests that support the mission of the MWCD. Members serve staggered three-year terms and are eligible for two consecutive terms which commence and end on a calendar year basis.



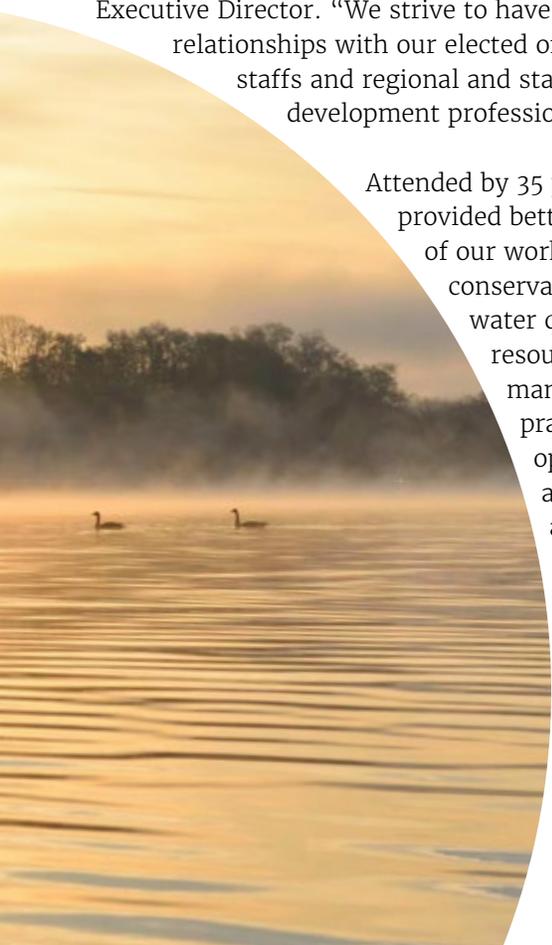


Legislative Day Held at Tappan Marina, Park

The MWCD held a Legislative Day at the new Tappan Lake Marina and Tappan Lake Park in 2021, hosting elected officials, legislative staff, economic development representatives and the U.S. Army Corps of Engineers. The event included updates and briefings on the activities and important work happening within the watershed in addition to tours of some of the recent accomplishments at Tappan Lake.

“As a political subdivision of the State of Ohio, MWCD is often impacted by the legislative actions at all levels of government,” said Craig Butler, MWCD Executive Director. “We strive to have positive working relationships with our elected officials and their staffs and regional and state economic development professionals.”

Attended by 35 people, the event provided better understanding of our work regarding conservation, recreation, water quality, natural resources and land management practices, engineering operations, as well as economic impacts and employment opportunities.



Rangers Receive Ohio Collaborative Certification

MWCD Rangers joined the ranks of nearly 75 percent of Ohio’s Law Enforcement officers by receiving the Ohio Collaborative Law Enforcement Agency Certification. The Ohio Collaborative is an independent body that establishes Professional Law Enforcement Standards for the state.

“Our 34 Rangers work countless hours to ensure the safety of not only the guests who visit the MWCD lakes, but also the surrounding communities,” said John Maxey, MWCD Chief Ranger. “We hold our Rangers to high standards and offer the most up-to-date training to make certain they know how to handle a wide variety of situations they may face throughout their day.”

The Rangers also received Gold Recognition by the Lexipol Connect Policy Recognition Program for their implementation of key metrics that have contributed to effective public safety policy management techniques. The Connect Recognition Program is designed to help public safety agencies address the critical need to achieve excellence in policy and training management procedures based on national best practices.



Bounty on the Bridge Initiated at Atwood

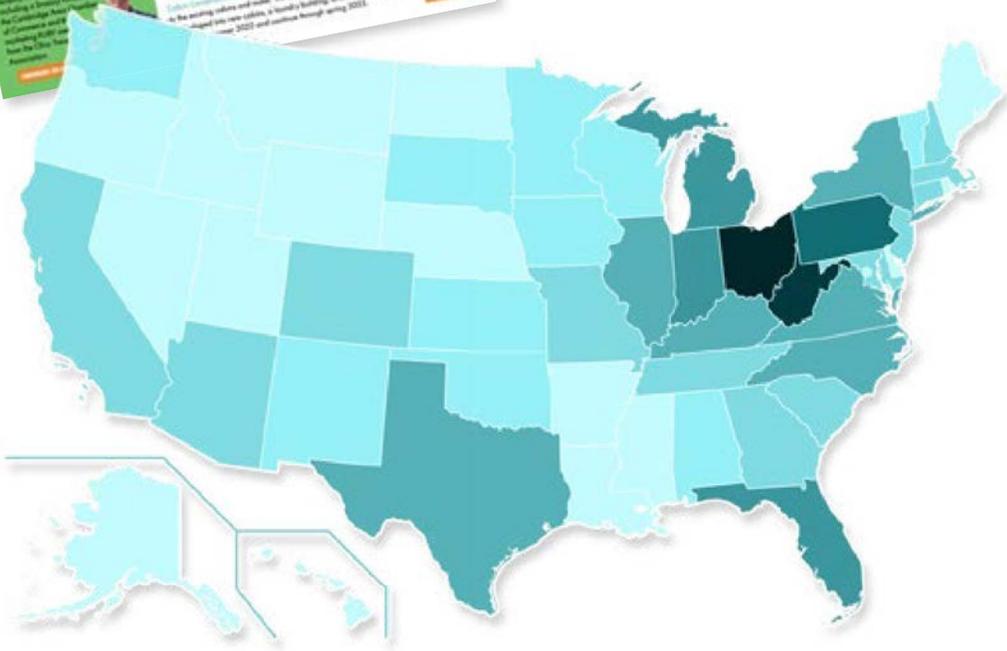
The inaugural Bounty on the Bridge event, held in October at Atwood Lake Park, was an exclusive dining experience featuring the Buckeye Career Center's culinary arts, floral design, and woodworking programs, preparing decorative centerpieces, commemorative cutting boards, and a four-course dinner. Over 90 people enjoyed the event, which benefited the Muskingum Watershed Conservancy Foundation.





MWCD Press Releases & Newsletters

In 2021, the MWCD Marketing & Communications Department released four editions of its newsletter, LakeViews, to keep property owners and residents in the district informed about MWCD news, projects, and events. Additionally, 32 press releases were provided by MWCD in 2021.



Reservation Totals

The MWCD received over 32,000 reservations combined from all fifty states for cabins, camping sites, dock slips, and other activities in 2021.

Top 15 States By Reservations

Ohio	27,998
West Virginia	1,525
Pennsylvania	1,029
Florida	185
Michigan	184
Indiana	130
New York	91
Kentucky	67
Texas	66
North Carolina	58
Virginia	51
Illinois	51
Maryland	42
Tennessee	39
California	39



STRATEGIC PLANNING ROOTED IN HISTORY, SUCCESSSES OF 2021

Without strategic direction, an organization is rudderless.

MWCD has a history of developing strong strategic plans to guide the operations and expenses of the organization, honoring our original mission and understanding where today's stakeholders feel the District needs to be positioned.

In 2012, and again in 2017, MWCD Executive Leadership and the Board of Directors utilized valuable input from key internal stakeholders to develop a planning process to ensure that all important issues would be considered when setting priorities. These strategic plans have guided major MWCD activities, such as maintaining dams, improving cottage areas, completing shoreline and dredging projects, while investing millions of dollars to upgrade MWCD's parks and marinas.

In 2021, MWCD began planning the next iteration of the strategic plan which will build upon the success of previous plans with the goal of charting a course for the next five years. Certainly, we will continue work on enduring priorities; however, a renewed and expanded focus will be placed on conservation, water quality, and community water infrastructure challenges.

Furthermore, MWCD is committed to working diligently to ensure long-term financial stability to serve the over 200 municipalities and more than 2 million residents that call the Muskingum River Watershed home.





Atwood Activity Center Undergoing Renovation

The Atwood Activity Center is undergoing an exterior and interior renovation, with new siding, a new roof structure, a new covered outdoor patio, the addition of a central gathering area, and reorganization of the existing kitchen and retail areas. The Nature Center is also being reorganized and renovated, with construction expected from Spring 2022 through Spring 2023.



Seneca Marina Undergoing Improvements

Seneca Marina is seeing the reconstruction of the existing deck and a new permanent pavilion structure for outdoor dining. A new sloped concrete accessible walking path to the lower-level marina will also be constructed. A 500-foot shoreline/waterfront project includes a retaining wall, a lighted concrete sidewalk along the shoreline for access to the docks, and four new dock abutments. Construction began in late fall of 2021 with final completion expected in late spring of 2022.



Tappan Project Will Welcome Visitors

Construction of a new welcome center will provide an accessible and inviting entrance to Tappan Lake Park, to efficiently enable visitors to reserve a campsite and shop for camping items and souvenirs. The building, which will resemble the Atwood Lake Park Welcome Center seen here, will be designed to house the park's administration and Ranger staff and is expected to open in the spring of 2023.

Cottage Importance Recognized

In 2021, MWCD began examining potential development areas for additional cottages throughout the watershed. Analyzing environmental impacts, particularly to conservation efforts, careful consideration is being given to each property.

MWCD managed 1,204 cottages sites in 2021 at Atwood, Tappan, Seneca, Pleasant Hill, Charles Mill, Leesville, Piedmont, and Wills Creek. The cottages serve many as vacation homes, weekend getaways, or forever homes by providing an escape from the stresses of everyday life with the beauty of picturesque landscapes and relaxation with an array of recreational opportunities.

MWCD is committed to adding facilities and amenities that will become a model for outdoor recreation, with the hope that future results will leave a legacy for future generations to enjoy the benefits of the Muskingum River Watershed.



2021 COTTAGE LEASES

Atwood — 365
Charles Mill — 211
Leesville — 103
Piedmont — 91
Pleasant Hill — 96
Seneca — 166
Tappan — 146
Wills Creek — 26
TOTAL — 1,204

HIGHLIGHTS OF LEASING AND DOCKING/SHORELINE ACTIVITIES

- 1,204 cottage sites were under lease
 - 67 new leaseholders
- About 30 percent of lessees are full-time residents across all lakes
- Staff processed about 248 new construction permits
- Nearly 500 other projects/permits including:
 - Tree permits
 - Firewood permits
 - Inspections
- 80 lease conferences were held with new leaseholders as well as education of local realtors
- More than 120 docking construction permits were initiated
- Over 3,800 docking decals were processed across three main user groups:
 - Cottage lessees (1,851)
 - Docking associations
 - Two club site leases (1,960)



OVER
57,000
ACRES OF LAND
UNDER MANAGEMENT

Coshocton Forest Permanently Preserved

In 2021, Western Reserve Land Conservancy, Ohio Public Works Commission, and MWCD worked together to permanently preserve an additional 934 acres of forest in Linton Township, Coshocton County. The Coshocton Forest Extension property connects the 1,827-acre Coshocton Forest Property acquired in 2020 and the original 3,807-acre Wills Creek Lake property.

With this additional land purchase, MWCD has ensured the land will forever remain open for hiking, birdwatching, nature study, fishing, hunting, and more, while also contributing to the \$56.5 million tourism industry in Coshocton County.

This acquisition highlights the value of MWCD's long-term view on conservation. This land, through tree planting efforts and natural forest succession, has returned to a true natural resource for all Ohioans after decades of strip mining. This property provides an array of unique habitats supporting many species of birds, mammals, reptiles, and plants, some of which are rare in Ohio and listed as Species of Special Concern.

The project also presents outstanding opportunities for connectivity of protected area and linkage to public outdoor recreation areas. In addition to creating a 6,586-acre block, all owned and managed by MWCD, the property is the “missing link” that further connects to ODNR-managed AEP Conesville Public Recreation Lands establishing over 10,000 acres of natural area open for recreational opportunities.

MWCD currently manages over 57,000 acres of land and water in the Muskingum River Watershed, and will own and manage the Coshocton Forest property going forward. MWCD intends to manage the property for the preservation and enhancement of healthy sustainable forests and waters, along with the conservation of valuable natural resources. At the same time, the property will be managed to continue to provide and enhance outdoor recreational opportunities for the public to enjoy.



Forestry Efforts Include Invasive Species Control

Timber stand improvement projects were completed for more than 335 acres of grapevine control and other invasive species control projects in 2021. Grapevines can be extremely damaging in trees; they tend to bring down trees especially during icy and windy conditions.

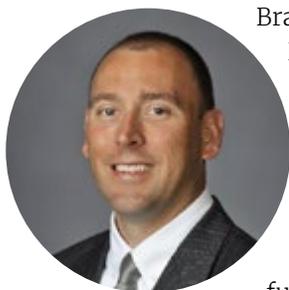
MWCD's goal is to focus on removing vines in areas where we have some of our best trees. Invasive trees and shrubs can quickly invade a particular area and out compete native species of trees and plants. A focused effort has been to control these species where future disturbances may occur or where native trees are being stunted by high invasive densities.

Forestry staff also had two reforestation projects in 2021. Around 775 trees were given away to participants at Atwood, Seneca, and Piedmont Lakes to be planted on MWCD cottage leased lands. The purpose of the giveaway was to reforest areas that lost trees due to disease, storm damage, natural decline, or park renovations. Shelters were used to help protect the trees from deer and mowing, promoting growth by acting like a mini greenhouse. Additionally, about 10,000 trees were planted on 22 acres at the old Atwood Lake golf course.

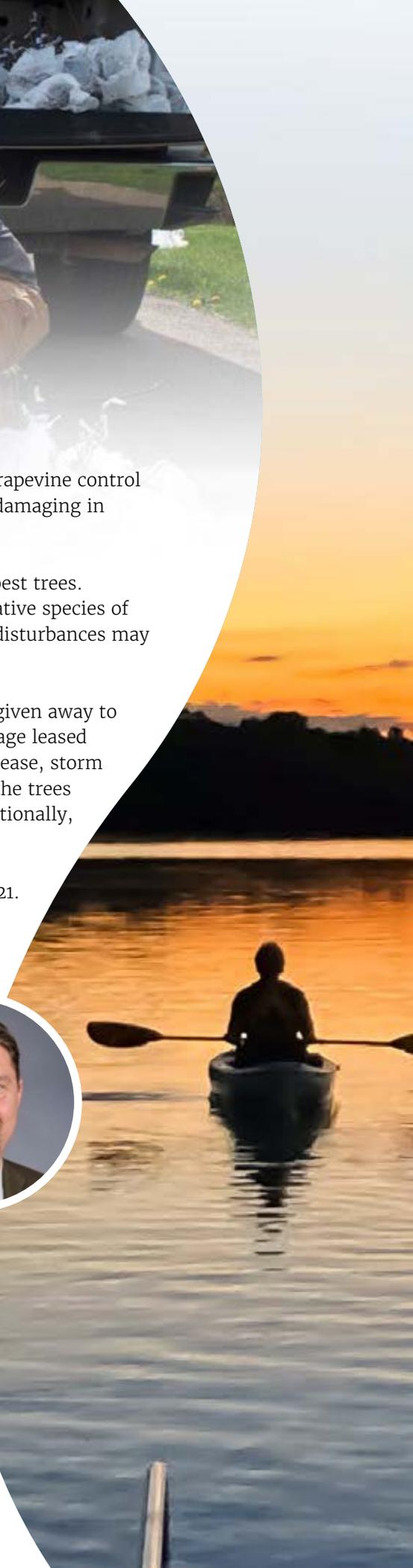
Preparations for trees to be planted in 2022 on 35 acres at Tappan Lake began in 2021.

New Positions Meet Evolving Goals

Matt Thomas has been named Chief of Conservation, having previously served as the Water Quality Coordinator. Thomas is responsible for defining and maintaining metrics and criteria by which MWCD's conservation efforts will be assessed. Furthermore, Thomas oversees and manages the day-to-day conservation operations of the organization including land and water quality, watershed management, conservation education, and sustainability practices of the District.



Brad Janssen has been named Chief of Natural Resources and Land Management, previously serving as a member of the Executive Team as Chief of Conservation since 2018. He is coordinating all land management activities under one program, providing better stewardship of the natural resources within the district and greater collaboration with conservation projects in future years.





2021 FINANCIAL REPORT

This financial report is designed to provide our citizens, investors, and creditors with a general overview of MWCD's finances and to show MWCD's accountability for the money it receives. To see the complete financial statements, visit www.mwcd.org or the State Auditor's website at www.ohioauditor.gov.

2021 END OF YEAR CASH AND INVESTMENT BALANCES

12/31/21 Cash And Investment Balance	
Fund 1 - Improvement Fund	\$ 1,274,903
Fund 2 - Maintenance Fund	58,194,918
Fund 3 - Recreation Improvement Fund	3,253,381
Fund 4 - Bond Fund	100
Fund 9 - Maintenance Assessment Fund	13,368,858
Grand Total	\$ 76,092,161

2021 SCHEDULE OF RECEIPTS AND DISBURSEMENTS (CASH BASIS)

Fund	2021 YTD Actual Revenue
001 Improvement Fund	\$ 986
002 Maintenance Fund	30,281,532
003 Recreation Improvement Fund	589,729
009 Maintenance Assessment Fund	6,050,458
Grand Total	\$ 36,922,706

Fund	2021 YTD Actual Expenditures
002 Maintenance Fund	\$ 16,640,511
003 Recreation Improvement Fund	11,565,340
009 Maintenance Assessment Fund	5,302,021
Grand Total	\$ 33,507,871

Department	2021 YTD Actual Revenue
10 Administrative	\$ 6,011,435
13 Human Resources & Safety	16,780
15 Finance	948,439
20 Engineering	291,937
60 Leasing	3,208,341
65 NATURAL RESOURCES	12,521,078
80 Parks & Recreation	10,662,373
85 Marinas	3,224,129
89 Rangers	38,195
Grand Total	\$ 36,922,706

Department	2021 YTD Actual Expenditures
10 Administrative	\$ 1,689,575
11 Information Technology	839,086
12 Public Information	237,476
13 Human Resources/Safety	569,523
14 Legal	261,680
15 Finance	671,710
20 Engineering	14,632,407
50 Conservation	692,047
60 Leasing	884,896
65 Natural Resources	1,315,746
80 Parks & Recreation	8,234,626
85 Marinas	2,224,339
89 Rangers	1,254,761
Grand Total	\$ 33,507,871

Activity	2021 YTD Actual Revenue
15000 Easements & Right of Ways	\$ 986
21000 Use of Water Assets	167,853
21002 Use of Water Assets	32,666
23000 Land & Building Rental	30,948
24000 Farm Operations - Sharecrop	148,227
27000 Assessment	5,855,534
28100 Shoreline Protection	66,127
29100 Mineral Operations - Oil and Gas	11,829,154
33000 Timber Harvesting	302,842
36000 Pine Pulpwood Operations	71,949
48000 General Park Facilities	209,776
50000 Water Systems	30,800
51000 Fishing Rights	62,647
51500 Special Clean Up Operations	16,780
51600 Lake Patrol Operations	38,195
52000 Marina Operations	2,651,088
52100 Marina Operations - Camping	573,040
53000 Cottage Sites	2,581,759
53100 Club Sites	59,780
53200 Multiple Docks	510,916
54002 Sites Lake Sewer System	49,110
54003 Mifflin Water System	2,100
54009 Seneca Chestnut Grove Sewer	24,600

Activity	2021 YTD Actual Revenue
54012 Park Sewer System	866
55000 Vacation Cabins	878,294
56000 Beach Facilities	98
56100 Park Refreshment Stands	27,868
56300 Boat Rentals	44,766
56500 Activity Centers	97,690
56700 Vending Machines	28,465
57000 Park Camping	8,766,956
57100 Trailer Pump Out	26,091
57200 Camper Trailer Storage	253,800
57500 Firewood	36,728
58000 General Park Facilities	214,265
58100 Park Shelters	21,979
58800 Special Events	55,499
58801 Alive	149,111
80000 Interest on Investments	948,089
81000 Miscellaneous Income	16,871
81100 Bad Check Charges	350
81500 Construction Permits	8,375
84700 Capital Credit Refunds	13,038
86200 Misc Revenue - Taxes	16,630
Grand Total	\$ 36,922,706

Appropriations Grouping	2021 YTD Actual Expenditures
Personnel	\$ 10,606,496
Materials & Supplies	1,936,496
Publicity & Advertising	221,823
Utilities	1,520,580
Health Insurance Laser	601,110
Gas & Oil And Service	431,646
Contracts	14,298,451
Resale	529,049
Operating Equipment	1,041,211
Real Estate Taxes	405,152
Other	1,915,857
Grand Total	\$ 33,507,871

If you have questions about this report or need additional information, contact James Crandall, MWCD CFO at (330) 343-6647 or jcrandall@mwcd.org.



OUR MISSION

Responsible stewards
dedicated to providing
the benefits of flood reduction,
conservation and recreation
to the Muskingum River Watershed



OUR VISION

Respected and valued Leader,
Employer and Partner
in Flood Reduction,
Conservation and Recreation

CORE VALUES

SERVICE	We take the extra step to understand the needs of our customers, external stakeholders and each other, focusing on solutions to provide the best experience possible.
TEAMWORK	We leverage our collective knowledge and work as a team together to advance our mission and improve the organization.
EXCELLENCE	What we do, we do well, keeping our standards of service and our work performance at a high level.
WITH INTEGRITY	We work with each other, our customers and partners openly and sincerely in an ethical and professional manner.
ACCOUNTABILITY	We do what we say we are going to do with a positive attitude and a willingness to grow, learn and challenge ourselves and each other.
RESPECT	We treat others with courtesy and dignity as we would like to be treated.
DEDICATION	We have passion for our mission and we are committed to our work and the role we play in our organization.
SAFETY	We foster a culture of safety to ensure protection of our customers, our partners and each other.



MAIN OFFICE
1319 Third Street NW
New Philadelphia, OH
44663

MAIN OFFICE ANNEX (Engineering and Recreation)
2050 Reiser Avenue SE
New Philadelphia, OH
44663

MUSKINGUM WATERSHED
CONSERVANCY DISTRICT
TUSCARAWAS COUNTY, OHIO

REGULAR AUDIT

FOR THE YEAR ENDED
DECEMBER 31, 2021



Rea & associates

www.reacpa.com

OHIO AUDITOR OF STATE
KEITH FABER



88 East Broad Street
Columbus, Ohio 43215
IPAReport@ohioauditor.gov
(800) 282-0370

Board of Directors
Muskingum Watershed Conservancy District
1319 3rd Street NW
New Philadelphia, Ohio 44663

We have reviewed the *Independent Auditor's Report* of the Muskingum Watershed Conservancy District, Tuscarawas County, prepared by Rea & Associates, Inc., for the audit period January 1, 2021 through December 31, 2021. Based upon this review, we have accepted these reports in lieu of the audit required by Section 117.11, Revised Code. The Auditor of State did not audit the accompanying financial statements and, accordingly, we are unable to express, and do not express an opinion on them.

Our review was made in reference to the applicable sections of legislative criteria, as reflected by the Ohio Constitution, and the Revised Code, policies, procedures and guidelines of the Auditor of State, regulations and grant requirements. The Muskingum Watershed Conservancy District is responsible for compliance with these laws and regulations.

A handwritten signature in black ink that reads "Keith Faber".

Keith Faber
Auditor of State
Columbus, Ohio

May 09, 2022

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Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
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December 31, 2021

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Independent Auditor's Report

Muskingum Watershed Conservancy District
Tuscarawas County
1319 3rd Street NW
New Philadelphia, OH 44663

Report on the Audit of the Financial Statements

Opinion

We have audited the accompanying financial statements of the Muskingum Watershed Conservancy District (the Conservancy District), Tuscarawas County, Ohio, as of and for the year ended December 31, 2021, and the related notes to the financial statements, which collectively comprise the Conservancy District's basic financial statements as listed in the table of contents.

In our opinion, the accompanying financial statements referred to above present fairly, in all material respects, the respective financial position of the Muskingum Watershed Conservancy District, Tuscarawas County, Ohio, as of December 31, 2021, and the changes in financial position and its cash flows for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (GAAS) and the standards applicable to financial audits contained in *Government Auditing Standards* (Government Auditing Standards) issued by the Comptroller General of the United States. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the Conservancy District and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the Conservancy District's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS and *Government Auditing Standards* will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with GAAS and *Government Auditing Standards*, we

- exercise professional judgment and maintain professional skepticism throughout the audit.
- identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Conservancy District's internal control. Accordingly, no such opinion is expressed.
- evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the Conservancy District's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and pension and other post-employment benefit schedules, as listed in the table of contents, be presented to supplement the basic financial statements. Such information is the responsibility of management and, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied

certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated April 22, 2022 on our consideration of the Conservancy District's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the Conservancy District's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering Conservancy District's internal control over financial reporting and compliance.

Rea & Associates, Inc.

Rea & Associates, Inc.
New Philadelphia, Ohio
April 22, 2022

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Management's Discussion and Analysis
For the Year Ended December 31, 2021

The discussion and analysis of the Muskingum Watershed Conservancy District's (the "Conservancy District") financial performance provides an overall review of the Conservancy District's financial activities for the year ended December 31, 2021. The intent of this discussion and analysis is to look at the Conservancy District's financial performance as a whole; readers should also review the financial statements and notes to the basic financial statements to enhance their understanding of the Conservancy District's financial performance.

FINANCIAL HIGHLIGHTS

Key financial highlights for 2021 are as follows:

- Net position increased \$14,450,764 as a result of current year operations.
- Outstanding debt decreased from \$580,745 to \$503,326 through principal payments.
- Capital Assets increased \$5,619,787 as a result of an increase in park master planning projects.

OVERVIEW OF THE FINANCIAL STATEMENTS

This annual report consists of three parts – required supplementary information, the basic financial statements, and notes to the basic financial statements. These statements are organized so that the reader can understand the financial position of the Conservancy District. The statement of net position represents the basic statement of position for the Conservancy District. The statement of revenues, expenses and changes in net position present increases (e.g. revenues) and decreases (e.g. expenses) in net total position. The statement of cash flows reflects how the Conservancy District finances and meets its cash flow needs. Finally, the notes to the basic financial statements provide additional information that is essential to a full understanding of the data provided on the basic financial statements.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Management's Discussion and Analysis
For the Year Ended December 31, 2021

FINANCIAL ANALYSIS OF THE CONSERVANCY DISTRICT AS A WHOLE

The Conservancy District is not required to present government-wide financial statements as the Conservancy District is engaged in only business-type activities. Therefore, no condensed financial information derived from government-wide financial statements is included in the discussion and analysis.

The following tables represent the Conservancy District's condensed financial information for 2021 and 2020 derived from the statement of net position and the statement of revenues, expenses, and changes in net position.

	<u>2021</u>	<u>2020</u>
Assets		
Current and Other Assets	78,361,525	75,848,891
Capital Assets, Net	<u>189,769,396</u>	<u>184,149,609</u>
<i>Total Assets</i>	<u>268,130,921</u>	<u>259,998,500</u>
Deferred Outflows of Resources		
OPEB	469,894	1,195,451
Pensions	<u>1,059,038</u>	<u>1,658,426</u>
<i>Total Deferred Outflows of Resources</i>	<u>1,528,932</u>	<u>2,853,877</u>
Liabilities		
Current Liabilities	2,988,466	3,165,887
Long-Term Liabilities	<u>9,610,667</u>	<u>19,848,231</u>
	<u>12,599,133</u>	<u>23,014,118</u>
Deferred Inflows of Resources		
OPEB	3,004,508	1,231,635
Pensions	<u>3,625,569</u>	<u>2,626,745</u>
<i>Total Deferred Inflows of Resources</i>	6,630,077	3,858,380
Net Position		
Net Investment in Capital Assets	188,328,636	182,228,174
Restricted	14,608,605	11,557,807
Unrestricted	<u>47,493,402</u>	<u>42,193,898</u>
<i>Total Net Position</i>	250,430,643	235,979,879

The net pension liability (NPL) is the largest single liability reported by the Conservancy District at December 31, 2021 and is reported pursuant to GASB Statement 68, *Accounting and Financial Reporting for Pensions—an Amendment of GASB Statement 27*. The net other postemployment benefits (OPEB) asset is reported pursuant to GASB Statement 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions*. For reasons discussed below, many end users of this financial statement will gain a clearer understanding of the Conservancy District's actual financial condition by adding deferred inflows related to pension and OPEB, the net pension liability and the net OPEB asset to the reported net position and subtracting deferred outflows related to pension and OPEB.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio

Management's Discussion and Analysis
For the Year Ended December 31, 2021

Governmental Accounting Standards Board standards are national and apply to all government financial reports prepared in accordance with generally accepted accounting principles. Prior accounting for pensions (GASB 27) and postemployment benefits (GASB 45) focused on a funding approach. This approach limited pension and OPEB costs to contributions annually required by law, which may or may not be sufficient to fully fund each plan's *net pension liability* or *net OPEB liability*. GASB 68 and GASB 75 take an earnings approach to pension and OPEB accounting; however, the nature of Ohio's statewide pension/OPEB plans and state law governing those systems requires additional explanation in order to properly understand the information presented in these statements.

GASB 68 and GASB 75 require the net pension liability and the net OPEB liability/asset to equal the Conservancy District's proportionate share of each plan's collective:

1. Present value of estimated future pension/OPEB benefits attributable to active and inactive employees' past service
2. Minus plan assets available to pay these benefits

GASB notes that pension and OPEB obligations, whether funded or unfunded, are part of the "employment exchange" – that is, the employee is trading his or her labor in exchange for wages, benefits, and the promise of a future pension and other postemployment benefits. GASB noted that the unfunded portion of this promise is a present obligation of the government, part of a bargained-for benefit to the employee and should accordingly be reported by the government as a liability since they received the benefit of the exchange. However, the Conservancy District is not responsible for certain key factors affecting the balance of these liabilities. In Ohio, the employee shares the obligation of funding pension benefits with the employer. Both employer and employee contribution rates are capped by State statute. A change in these caps requires action of both Houses of the General Assembly and approval of the Governor. Benefit provisions are also determined by State statute. The Ohio Revised Code permits but does not require the retirement systems to provide healthcare to eligible benefit recipients. The retirement systems may allocate a portion of the employer contributions to provide for these OPEB benefits.

The employee enters the employment exchange with the knowledge that the employer's promise is limited not by contract but by law. The employer enters the exchange also knowing that there is a specific, legal limit to its contribution to the retirement system. In Ohio, there is no legal means to enforce the unfunded liability of the pension/OPEB plan *as against the public employer*. State law operates to mitigate/lessen the moral obligation of the public employer to the employee, because all parties enter the employment exchange with notice as to the law. The retirement system is responsible for the administration of the pension and OPEB plans.

Most long-term liabilities have set repayment schedules or, in the case of compensated absences (i.e. sick and vacation leave), are satisfied through paid time-off or termination payments. There is no repayment schedule for the net pension liability. As explained above, changes in benefits, contribution rates, and return on investments affect the balance of these liabilities, but are outside the control of the local government. In the event that contributions, investment returns, and other changes are insufficient to keep up with required payments, State statute does not assign/identify the responsible party for the unfunded portion. Due to the unique nature of how the net pension

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Management's Discussion and Analysis
For the Year Ended December 31, 2021

liability is satisfied, this liability is separately identified within the long-term liability section of the statement of net position.

In accordance with GASB 68 and GASB 75, the Conservancy District's statements prepared on an accrual basis of accounting include an annual pension expense and an annual OPEB expense for their proportionate share of each plan's *change* in net pension liability and net OPEB liability/asset, respectively, not accounted for as deferred inflows/outflows.

During 2021, net position increased \$14,450,764 which is attributable to increases in the capital assets resulting from the park master plan implementation and significant decreases in the net OPEB liability.

Capital assets increased due to many ongoing and completed construction projects. 50 projects were completed during 2021, the largest of which were Tappan Marina Renovations, Atwood Campground Phase II, Seneca Marina Campground Phase II, Pleasant Hill Campground Phase III, and Charles Mill Campground Phase III. As the final stages of the Park Master Plan are underway and more of the extensive park projects have been completed, there was a significant decrease in construction in progress in 2021. At December 31, 2021, construction in progress was approximately \$7.07 million.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Management's Discussion and Analysis
For the Year Ended December 31, 2021

In order to further understand what makes up the changes in net position for the current year, the following table gives readers further details regarding the results of activities for 2021 and 2020.

	<u>2021</u>	<u>2020</u>
Operating Revenues		
Timber Sales	\$ 302,842	\$ 301,058
Pine-Pulpwood Sales	71,949	104,765
Mineral Rights and Royalties	11,829,151	9,357,536
Share Crop Lease	148,227	164,483
Cottage Sites	3,152,455	3,081,380
Marina Operations	2,651,088	2,636,003
Fishing Rights	62,647	62,646
Marina Camping	552,421	476,289
Water Sales	200,519	288,074
Beach Facilities	198,886	172,433
Water and Sewer Systems	107,476	111,498
Vacation Cabin	860,779	629,099
Park Camping	8,710,757	6,412,511
Admissions - park facilities	233,085	275,180
Special Events	204,610	9,814
Miscellaneous Income	220,809	401,695
<i>Total Operating Revenues</i>	<u>\$29,507,701</u>	<u>\$24,484,464</u>

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio

Management's Discussion and Analysis
For the Year Ended December 31, 2021

	<u>2021</u>	<u>2020</u>
Operating Expenses		
Water Sales	\$ -	\$ 67,500
Water quality	631,539	581,772
Water Resources/Flood Control	586,894	-
Vehicles and equipment	597,504	361,898
Dam Safety/Upgrades	524,900	490,610
Boundary survey	25,838	93,196
Conservation	96,449	174,259
Reservoir Maintenance	51,001	43,830
Information Systems/Technology	493,796	703,375
Shoreline Protection	33,300	263,646
Share crop	38,680	42,556
Mineral operation	86,733	284,627
Watershed management	568,394	525,043
Beach facilities	110,087	127,688
Office building	213,953	253,557
Administrative and finance	1,527,159	2,762,078
Engineering	336,478	300,079
Planning and development	83,142	220,195
GIS and Parcel Development	9,934	240,954
Forestry maintenance	114,520	265,449
Park camping	2,009,319	2,904,894
Park Master Planning	1,448,908	2,177,095
Cottage sites and clubs	780,204	1,444,585
General park facilities	1,945,441	3,951,472
Vacation cabin	344,171	215,686
Marina operation	1,397,430	1,954,931
Water and sewer system	395,250	760,595
Lake patrol operation	456,870	716,404
Education and public information	195,190	109,942
Safety	121,950	181,558
Recreation maintenance	36,696	16,899
Parks - special events	148,388	53,354
Partners in Watershed Management	511,243	1,968,247
Sediment Removal	-	67,968
Depreciation	8,761,900	7,480,891
	<u>24,683,261</u>	<u>31,806,833</u>
<i>Total Operating Expenses</i>		
	<u>\$ 4,824,440</u>	<u>\$ (7,322,369)</u>
<i>Operating Income (Loss)</i>		

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Management's Discussion and Analysis
For the Year Ended December 31, 2021*

	2021	2020
Non-Operating Revenues (Expenses)		
Capital Contributions	\$ 936,000	\$ -
Maintenance assessments	6,184,214	5,986,634
Grants	2,835,368	4,379,378
Interest on investments	(292,117)	2,029,896
Debt retirement - Interest	(37,141)	(46,860)
<i>Total Non-Operating Revenues (Expenses)</i>	<u>9,626,324</u>	<u>12,349,048</u>
<i>Change in Net Position</i>	<u>\$ 14,450,764</u>	<u>\$ 5,026,679</u>

The overall increase in operating revenue is a combination of increases in oil and gas activity and park camping activity. Due to various global factors, there was an easing of COVID restrictions during 2021 which resulted in economic growth and development and a greater demand for oil compared to 2020. Though commodity prices have not returned to their pre-COVID prices, the rise in the current year led to approximately \$2.4 million increase of mineral rights and oil revenues in 2021. Activity in the parks and marinas remained strong. There was record attendance for park camping and with the easing of COVID restrictions, special events such as the Fall Festival and Alive were held again during 2021.

Most operating expenses trended down in 2021:

- Many accounts decreased due to the significant fluctuation in the OPEB liability. Administrative and finance, park master planning, and general park facilities expenses had the most impact. Of the approximate \$3.9 million change in those accounts between 2021 and 2020, about \$3.02 million was due to the decrease in the OPEB liability.
- Partners in Watershed Management (PWM) decreased approximately \$1.4 million or 74% during 2021 and is a result of the timing of requests for reimbursement through this program and a reduction in the amount of grants awarded. PWM grants are typically funded at approximately \$500,000 - \$750,000 per year, however, in 2020 grant awards were \$1.1 million due to budget availability and project requests received. Grant awards in 2021 were \$770,000.
- Depreciation expense increased approximately \$1.2 million in 2021 due to the completion of several large park master planning projects totaling about \$30 million.

Grant revenue decreased \$1.5 million due to the receipt of \$2,000,000 from a Clean Ohio grant for the purchase of land at Wills Creek in 2021 compared to the \$4,000,000 Clean Ohio grant received in 2020. Interest on investments fluctuated due to a fair market value adjustment to properly reflect market conditions.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Management's Discussion and Analysis
For the Year Ended December 31, 2021

CAPITAL ASSETS AND DEBT ADMINISTRATION

Capital Assets

At the end of 2021 the Conservancy District had \$189,769,396 of capital assets net of accumulated depreciation. The following table shows 2021 balances compared with 2020:

	<u>2021</u>	<u>2020</u>
Land	\$ 12,273,475	\$ 8,797,691
Capitalized Development Costs	1,189,495	1,189,495
Construction in Progress	7,075,336	27,540,660
Land Improvements	69,529,705	60,532,284
Buildings	38,547,725	29,643,262
Building Improvements	2,943,617	2,983,201
Furniture, Fixtures and Equipment	2,765,456	2,797,752
Vehicles	257,587	293,234
Infrastructure	<u>55,187,000</u>	<u>50,372,030</u>
<i>Totals</i>	<u>\$ 189,769,396</u>	<u>\$ 184,149,609</u>

Additional information on the Conservancy District's capital assets can be found in Note 5.

Debt

The outstanding debt for the Conservancy District as of December 31, 2021 was \$503,326 with \$80,457 due within one year. The following table summarizes the Conservancy District's debt outstanding as of December 31, 2021 and 2020:

	<u>2021</u>	<u>2020</u>
OWDA #2162 - 5.56%	\$ 94,559	\$ 128,898
OWDA #5413 - 0%	75,556	85,000
OWDA #5575 - 3.25%	318,829	350,914
OWDA #5558 - 3.25%	<u>14,382</u>	<u>15,933</u>
<i>Totals</i>	<u>\$ 503,326</u>	<u>\$ 580,745</u>

Additional information on the Conservancy District's long-term debt can be found in Note 10.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Management's Discussion and Analysis
For the Year Ended December 31, 2021

CURRENT ISSUES

The Utica shale activity in Ohio has presented the Conservancy District with opportunities to utilize its natural resources. As of December 31, 2021, the Conservancy District received royalties from ninety-two (92) producing Utica wells and further income in the form of delay rental payments for non-producing acreage. Oil and gas leases covering Leesville, Clendening, and Seneca reservoirs currently have producing wells and development around these reservoirs is expected to continue into 2022 and beyond. With over 15,000 additional acres available for lease in key areas of the Utica Shale, the Conservancy District will continue to evaluate and analyze future opportunities to participate in responsible development and recovery of its resources.

The Utica shale activity has allowed the Conservancy District to fund significant upgrades to the parks and marinas it owns and operates. Phase 1 of the park master plan is complete as of December 31, 2021, which featured major upgrades to its campgrounds and related infrastructure. The 2021 season was the first since the master plan began where there were no significant construction projects impacting the recreation season at the parks, and the Conservancy District received over \$13.8 million in revenue, which was a record setting year. The Conservancy District is looking to build on that in 2022. As of December 31, 2021, the Conservancy District has received over \$1 million in reservations for the 2022 season. Phase II of the park master plan is underway which had an allocation of an additional \$65 million. Phase II of the master plan will include additional marina and campground improvements with an emphasis on amenities within our facilities. Phase II of the master plan will continue for the next several years. The master plan budget for 2022 is over \$13 million.

In 2022, the Conservancy District will be embarking on an update to its strategic plan which will set the course for the next three to five years. As the park master planning projects begin to wind down over the next several years, the Conservancy District has looked to add an emphasis to its conservation efforts. During 2021, the Conservancy District broke out conservation to its own department and hired a Chief of Conservation. A separate strategic plan will be completed in 2022 focusing on conservation which will be worked into the overall strategic plan.

Trails in and around our facilities are another area of focus for the Conservancy District in 2021 and moving forward. Two new trails will be available for public use, the Atwood North Shore trail, which was completed in 2021 and allows trail access from the Atwood North Shore Cottage area to the park and the Atwood Cemetery Bay trail, which will be complete in the first quarter of 2022. The Atwood Cemetery Bay trail connects the park to State Route 542. The Conservancy District also hired a Trails Coordinator and a Trails Technician in 2021, and the focus will be to grow and maintain the network of trails in and around the Conservancy District. The Board of Directors approved an allocation of \$1.5 million of the 2022 Utica Shale royalty dollars to fund trail initiatives.

In 2021, the Conservancy District acquired an additional 934 acres of land at the Wills Creek reservoir that are contiguous with the previous acquisition of 1,827 acres in 2020. This land was acquired through a partnership with the Western Reserve Land Conservancy and was funded through the Clean Ohio Funding Green Space Conservation Program administered through the Ohio Public Works Commission. This land will continue to be used for numerous conservation, recreation and public use benefits.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Management's Discussion and Analysis
For the Year Ended December 31, 2021

Beginning with the 2015 collection year, the Board of Directors approved a 50% reduction in the maintenance assessment collections. This continued again for the 2021 collection year and into 2022. This assessment generates nearly \$6 million to be reinvested into projects and initiatives outlined in the Amendment to the Official Plan. Projects of significance in 2021 were a continuation of the dredge project at Seneca Reservoir. Over \$1.5 million was spent in 2021, this project removed over 85,000 cubic yards from Seneca reservoir. The Conservancy District continued its support for local community projects through the Partners in Watershed Management program. In 2021, over \$680,000 was spent through this program and the budget for 2022 is \$1.4 million. For fiscal year 2022, \$7.7 million has been allocated in the budget in the Maintenance Assessment fund.

REQUESTS FOR INFORMATION

This financial report is designed to provide our citizens, investors and creditors with a general overview of the Conservancy District's finances and to show the Conservancy District's accountability for the money it receives. If you have questions about this report or need additional information, contact James Crandall of the Muskingum Watershed Conservancy District.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Statement of Net Position
Proprietary Fund
December 31, 2021

Assets	
<i>Current Assets:</i>	
Equity in Pooled Cash and Investments	\$ 70,502,232
Cash with Fiscal Agent	5,000,543
Accrued Interest	2,180
Accounts Receivable	776,062
Prepays	30,421
Maintenance Assessments Receivable	<u>1,095,392</u>
<i>Total Current Assets</i>	<u>77,406,830</u>
<i>Non-Current Assets:</i>	
Net OPEB Asset	954,695
Non-Depreciable Capital Assets	20,538,306
Depreciable Capital Assets, Net	<u>169,231,090</u>
<i>Total Non-Current Assets</i>	<u>190,724,091</u>
<i>Total Assets</i>	<u>268,130,921</u>
Deferred Outflows of Resources	
OPEB	469,894
Pension	<u>1,059,038</u>
<i>Total Deferred Outflows of Resources</i>	<u>1,528,932</u>
Liabilities	
<i>Current Liabilities:</i>	
Accounts Payable	269,315
Contracts Payable	435,260
Retainage Payable	373,049
Performance Bond Payable	106,698
Due to Other Governments	83,802
Accrued Wages and Benefits	169,969
Accrued Interest Payable	100
Accrued Life Insurance	18,903
Claims Payable	209,000
Advances	1,010,216
Compensated Absences	150,754
Capital Leases Payable	80,943
OWDA Loans Payable	<u>80,457</u>
<i>Total Current Liabilities</i>	<u>2,988,466</u>
<i>Long-Term Liabilities:</i>	
Compensated Absences - net of current portion	1,057,572
Capital Leases Payable - net of current portion	151,771
OWDA Loans Payable - net of current portion	422,869
Net Pension Liability	<u>7,978,455</u>
<i>Total Long-Term Liabilities</i>	<u>9,610,667</u>
<i>Total Liabilities</i>	<u>12,599,133</u>
Deferred Inflows of Resources	
OPEB	3,004,508
Pension	<u>3,625,569</u>
<i>Total Deferred Inflows of Resources</i>	<u>6,630,077</u>
Net Position	
Net Investment in Capital Assets	188,328,636
Restricted for Maintenance Assessment	14,608,605
Unrestricted	<u>47,493,402</u>
<i>Total Net Position</i>	<u>\$ 250,430,643</u>

See accompanying notes to the basic financial statements

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Statement of Revenues, Expenses and Changes in Net Position
Proprietary Fund
For the Year Ended December 31, 2021

Operating Revenues	
Water Sales	\$ 200,519
Water and sewer systems	107,476
Timber sales	302,842
Pine/pulpwood sales	71,949
Mineral rights and royalties	11,829,151
Share crop lease	148,227
Cottage sites	3,152,455
Marina operations	2,651,088
Marina camping	552,421
Fishing rights	62,647
Beach facilities	198,886
Vacation cabin	860,779
Park camping	8,710,757
Parks - Special events	204,610
Admissions - park facilities	233,085
Miscellaneous income	<u>220,809</u>
<i>Total Operating Revenues</i>	<u>29,507,701</u>
Operating Expenses	
Water Quality	631,539
Water Resources/Flood Control	586,894
Vehicles and equipment	597,504
Dam safety/upgrades	524,900
Boundary survey	25,838
Conservation	96,449
Reservoir Maintenance	51,001
Information Systems/Technology	493,796
Shoreline Protection	33,300
Share crop	38,680
Mineral operation	86,733
Watershed management	568,394
Beach facilities	110,087
Office building	213,953
Administrative and finance	1,527,159
Engineering	336,478
Planning and development	83,142
GIS and Parcel Development	9,934
Forestry maintenance	114,520
Park camping expense	2,009,319
Park Master Planning	1,448,908
Cottage sites and clubs	780,204
General park facilities	1,945,441
Vacation cabin	344,171
Marina operation	1,397,430

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Statement of Revenues, Expenses and Changes in Net Position
Proprietary Fund
For the Year Ended December 31, 2021

	(Continued)
Water and sewer system	\$ 395,250
Lake patrol operation	456,870
Education and public information	195,190
Safety	121,950
Recreation maintenance	36,696
Parks - special events	148,388
Partners in Watershed Management (PWM)	511,243
Depreciation	<u>8,761,900</u>
<i>Total Operating Expenses</i>	<u>24,683,261</u>
<i>Operating Income</i>	4,824,440
Non-Operating Revenues (Expenses)	
Capital Contributions	936,000
Maintenance assessments	6,184,214
Grants	2,835,368
Interest on investments	(292,117)
Debt retirement - Interest	<u>(37,141)</u>
<i>Total Non-Operating Revenues (Expenses)</i>	<u>9,626,324</u>
<i>Change in Net Position</i>	14,450,764
Net Position - Beginning of Year	<u>235,979,879</u>
Net Position - End of Year	<u>\$ 250,430,643</u>

See accompanying notes to the basic financial statements

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Statement of Cash Flows
Proprietary Fund
For the Year Ended December 31, 2021

Cash flows from Operating Activities:	
Cash Received from Customers	\$ 30,020,318
Cash Payments to Suppliers for Goods and Services	(12,313,067)
Cash Payments for Employees Services and Benefits	<u>(10,213,263)</u>
<i>Net Cash Provided (Used) For Operating Activities</i>	<u>7,493,988</u>
Cash Flows from Noncapital Financing Activities:	
Principal Payments on OWDA Loans	(10,995)
Intergovernmental Grants	19,681
Maintenance Assessments	3,962,994
Interest Paid on Debt	<u>(466)</u>
<i>Net Cash Provided (Used) by Noncapital Financing Activities</i>	<u>3,971,214</u>
Cash Flows from Capital and Related Financing Activities:	
Acquisition of Capital Assets	(13,735,291)
Maintenance Assessments	2,215,265
Intergovernmental Grants	2,815,687
Principal Payments on OWDA Loans	(66,424)
Principal Payments on Capital Leases	(104,583)
Interest Paid on Debt	<u>(36,675)</u>
<i>Net Cash Provided (Used) for Capital and Related Financing Activities</i>	<u>(8,912,021)</u>
Cash Flows from Investing Activities:	
Receipts of Interest	946,963
Payments for purchase of investments	(43,918,801)
Proceeds from Sale of Investments	<u>40,690,699</u>
<i>Net Cash Provided (Used) for Investing Activities</i>	<u>(2,281,139)</u>
<i>Net Increase (Decrease) in Cash and Cash Equivalents</i>	272,042
<i>Cash and Cash Equivalents Beginning of Year</i>	<u>6,969,117</u>
<i>Cash and Cash Equivalents End of Year</i>	<u>\$ 7,241,159</u>
Reconciliation of Operating Gain To Net Cash Used by Operating Activities:	
Operating Income	\$ 4,824,440
Adjustments to Reconcile Operating Income to Net Cash Provided by Operating Activities:	
Depreciation	8,761,900
(Increase) Decrease in Assets and Deferred Outflows:	
Capitalized Costs	587,285
Accounts Receivable	101,266
Prepays	9,679
Net OPEB Asset	(954,695)
Deferred Outflows	1,324,945
Increase (Decrease) in Liabilities and Deferred Inflows:	
Accounts Payable	(207,687)
Performance Bond Payable	(16,359)
Escrow Funds Payable	7,894
Advances	411,350
Claims Payable	(27,001)
Accrued Wages and Benefits	36,387
Accrued Life Insurance	14,645
Compensated Absences	80,560
Due to Other Governments	2,658
Net OPEB Liability	(7,432,835)
Net Pension Liability	(2,802,141)
Deferred Inflows	<u>2,771,697</u>
<i>Net Cash Provided (Used) for Operating Activities</i>	<u>\$ 7,493,988</u>
Reconciliation of cash and investments reported on the Statement of Net Position to cash and cash equivalents reported on the Statement of Cash Flows:	
Statement of Net Position cash and cash equivalents and investments	\$ 75,502,775
Investments included in balances above that are not cash equivalents	<u>(68,261,616)</u>
Cash and Cash equivalents reported on Statement of Cash Flows	<u>\$ 7,241,159</u>

Noncash Capital Financing Activities:

During 2021, \$149,288 of capital assets were acquired on capital leases.
During 2021, \$936,000 of capital assets were acquired through capital contributions.
At December 31, 2021, the Conservancy District purchased \$808,309 in capital assets on account.
At December 31, 2020, the Conservancy District purchased \$1,236,966 in capital assets on account.

See accompanying notes to the basic financial statements

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 1: NATURE OF BASIC OPERATIONS AND DESCRIPTION OF ENTITY

The Muskingum Watershed Conservancy District was created as a separate political subdivision by the Ohio Legislature in 1933. The Muskingum Watershed Conservancy District (the "Conservancy District") was created in accordance with Chapter 6101 of the Ohio Revised Code which is concerned with the formation and governing of conservancy districts. The Conservancy District operates under an elected conservancy court consisting of eighteen court of common pleas judges, with one judge serving on the court from each county. Muskingum Watershed Conservancy District had a five-member Board of Directors in 2021 appointed by the court. All other officers and employees are hired in accordance with the provisions of Chapter 6101 of the Ohio Revised Code. The Conservancy District is a separate governmental entity within the eighteen county area served by the Conservancy District.

2021 Board of Directors:

- | | |
|---------------------------------|--------------------------|
| • Gordon Maupin – President | Term Expires July 2024 |
| • Clark Sprang – Vice President | Term Expires June 2025 |
| • James Gresh – Member | Term Expires July 2022 |
| • Joanne Limbach – Member | Term Expires June 2023 |
| • Robert Moorehead – Member | Term Expires August 2026 |

2021 Officers:

- Craig Butler – Executive Director/Secretary
- James L. Crandall – Chief Financial Officer/Treasurer

Services provided by the Conservancy District are defined in detail in the Ohio Conservancy District Act and Chapter 6101.04 of the Ohio Revised Code and include among other duties the following:

- (A) Preventing Floods
- (B) Regulating stream channels by changing, widening, and deepening the same
- (C) Providing a water supply for domestic, industrial, and public use
- (D) Providing for the collection and disposal of sewage and other liquid waste
- (E) Regulating the flow of streams and conserving their waters

The Conservancy District manages fourteen reservoirs and receives income from the following operations and other sources:

- (A) Park camping
- (B) Rental of sites for cottages
- (C) Sale of crops
- (D) Sale of timber and pulpwood
- (E) Boat marina rentals and docking
- (F) Assessment
- (G) Oil and Gas royalties
- (H) Water Sales

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 1: NATURE OF BASIC OPERATIONS AND DESCRIPTION OF ENTITY (continued)

Subdistricts:

Chippewa Subdistrict, Black Fork Subdistrict, Buffalo Subdistrict, and Duck Creek Subdistrict are blended component units of Muskingum Watershed Conservancy District. Each subdistrict was formed in accordance with Chapter 6101.71 of the Ohio Revised Code; Organization of subdistricts. They were put into action as a result of petitions of the owners of real property within their areas. To date the only active subdistricts are the Chippewa Subdistrict, Black Fork Subdistrict, and the Clear Fork Subdistrict. The current status of the Chippewa Subdistrict is to maintain and upgrade the dams and channels. In May of 2011, with work beginning in 2012, the Conservancy District Board of Directors, at the request of Shelby City officials, re-activated the Black Fork Subdistrict for the purpose of preparing an Official Plan, as required by the Ohio Revised Code, to address flooding within the Black Fork watershed. During 2018, a plan was developed that met the cost/benefit requirements contained in the ORC and significantly reduced the impacts of the 100-year flood, however, Shelby officials requested that the project be halted due to lack of public support and the project is currently suspended. In June of 2014, the Conservancy Court established the Clear Fork Subdistrict based on the request by several municipalities and stakeholders along the Clear Fork, in order to address localized frequent flooding. Based on the analysis and work performed the cost of the strategies exceeded the benefits and the Subdistrict will not move forward. Buffalo Creek Subdistrict, Clear Fork Subdistrict, and Duck Creek Subdistrict are inactive.

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The financial statements of the Conservancy District have been prepared in conformity with generally accepted accounting principles (GAAP) as applied to local governmental units. The Governmental Accounting Standards Board (GASB) is the accepted standard-setting body for establishing governmental accounting and financial reporting principles. The most significant of the Conservancy District's accounting policies are described below.

A. Basis of Presentation

The Conservancy District uses the accrual basis of accounting. Revenues are recognized when earned and expenses are recognized when incurred.

The Conservancy District operates as a self-supporting governmental enterprise and uses accounting polices applicable to governmental enterprise funds.

B. Measurement Focus

The enterprise fund is accounted for on a flow of economic resources measurement focus. All assets, deferred outflows of resources, all liabilities, and deferred inflows of resources associated with the operation of the Conservancy District are included on the statement of net position. The statement of revenues, expenses and changes in net position presents increases (i.e., revenues) and decreases (i.e., expenses) in net total position. The statement of cash flows provides information about how the Conservancy District finances and meets the cash flow needs of its enterprise activity.

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

C. Budgetary Process

Budget:

The Conservancy District's annual budget of revenues, expenses, and capital expenditures is prepared under the cash basis of accounting. The budget is adopted by resolution of the Board of Directors. The Conservancy District utilizes such budget and related budgetary accounting to ensure that: (1) service objectives are attained, (2) expenditures are properly controlled; and (3) adequate resources will be available to finance current operations and meet capital outlay requirements.

Because the Conservancy District's revenues and expenses may fluctuate, a flexible-rather than fixed-dollar budget is utilized to permit budgetary revision. Actual results of operations are compared to the final revised budget of the Conservancy District for the year.

Appropriations:

The annual appropriation measure is passed on or before the last meeting of the year in December, for the period January 1 to December 31 of the following year. The appropriation measure may be amended or supplemented by the board. The total amount appropriated from any fund for any year shall not exceed the sum of the unencumbered balance in the fund at the beginning of the year and the amounts to be received during such year from bonds authorized, and special assessments imposed prior to their appropriation, together with all other moneys estimated to be received by the fund during the year. At the close of each calendar year, all unencumbered balance of appropriations shall revert to the funds from which they were made and shall be subject to re-appropriation.

Encumbrances:

The Conservancy District is required to use the encumbrance method of accounting by virtue of Ohio Law. Under this system, purchase orders, contracts and other commitments for the expenditure of funds are recorded in order to reserve the portion of the applicable appropriation. At the close of the calendar year, the unencumbered balance of each appropriation reverts to the respective fund from which it was appropriated and becomes subject to future appropriations. The encumbered appropriation balance is carried forward to the succeeding fiscal year and need not be re-appropriated.

D. Property Assets/Depreciation

Capital Assets are defined by the Conservancy District as assets with an initial, individual cost of more than \$5,000. The capitalization threshold for building improvements is \$10,000 and for infrastructure and land improvements is \$25,000.

Property, plant and equipment acquired by the Conservancy District are stated at cost (or estimated historical cost), including architectural and engineering fees where applicable. Donated capital assets are recorded at their acquisition value as of the date received.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio

Notes to the Basic Financial Statements
For the Year Ended December 31, 2021

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

All reported capital assets are required to be depreciated except for land, construction in progress, and capitalized development costs. Depreciation has been provided using the straight-line method over the following estimated useful lives:

<u>Description</u>	<u>Estimated Lives</u>
Land Improvements	20 - 25 Years
Buildings	30 - 50 Years
Building Improvements	10 - 20 Years
Furniture, Fixtures and Equipment	3 - 15 Years
Vehicles	3 - 5 Years
Infrastructure	20 - 50 Years
Land	N/A
Construction in Progress	N/A
Capitalized Development Costs	N/A

E. Compensated Absences

Vacation benefits are accrued as a liability as the benefits are earned if the employees' rights to receive compensation are attributable to services already rendered and it is probable that the employer will compensate the employees for the benefits through paid time off or some other means. The Conservancy District records a liability for all accumulated unused vacation time when earned for all employees with more than one year of service.

Sick leave benefits are accrued as a liability using the termination method. An accrual for earned sick leave is made to the extent that it is probable that benefits will result in termination payments. The liability is an estimate based on the Conservancy District's past experience of making termination payments.

F. Pensions/Other Postemployment Benefits (OPEB)

For purposes of measuring the net pension/OPEB liability/asset, deferred outflows of resources and deferred inflows of resources related to pensions/OPEB, and pension/OPEB expense, information about the fiduciary net position of the pension/OPEB plans and additions to/deductions from their fiduciary net position have been determined on the same basis as they are reported by the pension/OPEB plan. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. The pension/OPEB systems report investments at fair value.

G. Net Position

Net position represents the difference between assets plus deferred outflows of resources and liabilities plus deferred inflows of resources. Net investment in capital assets, consists of capital assets, net of accumulated depreciation, reduced by the outstanding balances of any borrowings used for the acquisition, construction or improvement of those assets. Restricted for maintenance assessment represents the net position of the maintenance assessment fund, which are restricted by the official plan as to how it can be used.

Muskingum Watershed Conservancy District

Tuscarawas County, Ohio

Notes to the Basic Financial Statements

For the Year Ended December 31, 2021

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

The Conservancy District applies restricted resources first when an expense is incurred for purposes for which both restricted and unrestricted net position is available.

H. Revenue & Expenses

Operating revenues consist primarily of fees for services, rents and charges for use of Conservancy District facilities, oil and gas royalties, and other income. Operating expenses include the cost of providing these services, including administrative expenses and depreciation on capital assets.

Non-operating revenues and expenses are all revenues and expenses not meeting the definition of operating revenues and expenses. Non-operating revenues include intergovernmental grants, interest from investments, capital contributions, and maintenance assessment. Non-operating expenses include interest expense on long-term debt.

I. Deferred Outflows/Inflows of Resources

In addition to assets, the statements of net position will sometimes report a separate section for deferred outflows of resources. Deferred outflows of resources represent a consumption of net position that applies to a future period and will not be recognized as an outflow of resources (expense) until then. The Conservancy District has deferred outflows related to pension and OPEB. See notes 7 and 8 for additional information.

In addition to liabilities, the statements of net position will sometimes report a separate section for deferred inflows of resources. Deferred inflows of resources represent an acquisition of net position that applies to a future period and will not be recognized as an inflow of resources (revenue) until that time. The Conservancy District has deferred inflows related to pension and OPEB. See notes 7 and 8 for additional information.

J. Extraordinary and Special Items

Extraordinary items are transactions or events that are both unusual in nature and infrequent in occurrence. Special items are transactions or events that are within the control of the Board of Directors and that are either unusual in nature or infrequent in occurrence. During 2021, the Conservancy District had no extraordinary or special items.

K. Implementation of New Accounting Policies

For the year ended December 31, 2021, the Conservancy District has implemented Governmental Accounting Standards Board (GASB) Statement No. 93, *Replacement of Interbank Offered Rates* and GASB Statement No. 98, *The Annual Comprehensive Financial Report*.

GASB Statement No. 93 addresses accounting and financial reporting effects that result from the replacement of interbank offered rates (IBORs) with other reference rates in order to preserve the reliability, relevance, consistency, and comparability of reported information. The implementation of certain provisions (all except for paragraphs 13 and 14, which are effective for fiscal years

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

beginning after June 15, 2021), of GASB Statement No. 93 did not have an effect on the financial statements of the Conservancy District.

GASB Statement No. 98 establishes the term *annual comprehensive financial report* and its acronym *ACFR*. That new term and acronym replace instances of comprehensive annual financial report and its acronym in generally accepted accounting principles for state and local governments. The implementation of GASB Statement No. 98 did not have an effect on the financial statements of the Conservancy District.

L. Cash and Investments

To improve cash management, all cash received by the district is pooled except for funds received in the maintenance assessment fund. Individual fund integrity is maintained through the Conservancy District records. For financial statement purposes, this is presented as Equity in Pooled Cash and Investments.

The Conservancy District established a partnership with the Ohio Water Development Authority by establishing an Interest Subsidy Program. This program will buy down interest for communities within the jurisdictional boundary of the Conservancy District and will contribute to improved water quality throughout the region and promote economic development. The monies are held separate from the Conservancy District's central bank account and are reflected in the financial statements as Cash with Fiscal Agent.

M. Statement of Cash Flows

For the purposes of the statement of cash flows, cash and cash equivalents are defined as cash and any investment with an original maturity of 3 months or less. As of December 31, 2021, none of the Conservancy District's investments qualified as a cash equivalent.

N. Advances

The Conservancy District records unearned revenue when it has received moneys prior to having earned the revenue, or before all grant requirements have been met (other than time). At December 31, 2021 unearned revenue consisted of \$1,010,216 of moneys received in advance for reservations in our parks and marinas for 2022.

O. Reserve Account Balances

As part of the Conservancy District's strategic plan, there was an initiative to optimize fiscal balance. Therefore, in 2017, the Board of Directors approved a Deep Shale Royalty Revenue distribution plan which was renewed in 2021 and called for the creation of two reserve funds. One operational reserve fund which has a balance of approx. \$15.7 million, and a capital reserve fund which has a balance of approx. \$18.1 million as of December 31, 2021.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio

Notes to the Basic Financial Statements
For the Year Ended December 31, 2021

NOTE 3: DEPOSITS AND INVESTMENTS

State statutes classify monies held by the Conservancy District into three categories:

Active deposits are public deposits necessary to meet current demands on the treasury. Such monies must be maintained either as cash in the Conservancy District Treasury, in commercial accounts payable or withdrawable on demand, including negotiable order of withdrawal (NOW) accounts, or in money market deposit accounts.

Inactive deposits are public deposits that the Conservancy District has identified as not required for use within the current five-year period of designation of depositories. Inactive deposits must either be evidenced by certificates of deposit maturing not later than the end of the current period of designation of depositories, or by savings or deposit accounts including, but not limited to, passbook accounts.

Interim deposits are deposits of interim monies. Interim monies are those monies which are not needed for immediate use but which will be needed before the end of the current period of designation of depositories. Interim deposits must be evidenced by time certificates of deposit or by savings or deposit accounts including passbook accounts.

Protection of the Conservancy District's deposits is provided by the Federal Deposit Insurance Corporation (FDIC), or by the financial institutions participation in the Ohio Pooled Collateral System (OPCS), a collateral pool of eligible securities deposited with a qualified trustee and pledged to the Treasurer of State to secure the repayment of all public monies deposited in the financial institution.

Interim monies may be deposited or invested in the following securities:

1. United States treasury notes, bills, bonds, or any other obligation or security issued by the United States treasury or any other obligation guaranteed as to principal or interest by the United States;
2. Bonds, notes, debentures, or any other obligations or securities issued by any federal government agency or instrumentality, including but not limited to, the Federal National Mortgage Association, Federal Home Loan Bank, Federal Farm Credit Bank, Federal Home Loan Mortgage Corporation, Government National Mortgage Association, and Student Loan Marketing Association. All federal agency securities shall be direct issuances of federal government agencies or instrumentalities;
3. Bonds and other obligations of the State of Ohio;
4. No-load money market mutual funds consisting exclusively of obligations described in division (1) or (2) of this section and repurchase agreements secured by such obligations, provided that investments in securities described in this division are made only through eligible institutions; and
5. The State Treasurer's investment pool (STAROhio and Star Plus).

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 3: DEPOSITS AND INVESTMENTS (continued)

6. Certain bankers' acceptances for a period not to exceed one hundred eighty days and commercial paper notes for a period not to exceed two hundred and seventy days in an amount not to exceed 40 percent of the interim moneys available for investment at any time, provided no more than 5% of interim deposits available for investment are invested in any one issuer.

Investments in stripped principal or interest obligations, reverse repurchase agreements and derivatives are prohibited. The issuance of taxable notes for the purpose of arbitrage, the use of leverage and short selling are also prohibited. An investment must mature within five years from the date of purchase unless matched to a specific obligation or debt of the Conservancy District, and must be purchased with the expectation that it will be held to maturity.

Investments may only be made through specified dealers and institutions. Payment for investments may be made only upon delivery of the securities representing the investments to the treasurer or, if the securities are not represented by a certificate, upon receipt of confirmation of transfer from the custodian.

Deposits with Financial Institutions

Custodial credit risk for deposits is the risk that in the event of a bank failure, the Conservancy District will not be able to recover deposits or collateral securities that are in the possession of an outside party. At December 31, 2021, \$1,861,295 of the Conservancy District's total bank balance of \$4,483,502 was exposed to custodial credit risk because those deposits were uninsured and uncollateralized with securities held by the pledging financial institution's trust department or agent but not in the government's name. The Conservancy District's financial institutions participate in the Ohio Pooled Collateral System (OPCS) and one institution was approved for a reduced collateral floor of 50 percent resulting in the uninsured and uncollateralized balance.

The Conservancy District has no deposit policy for custodial risk beyond the requirements of State statute. Ohio law requires that deposits be insured or be protected by: Eligible securities specifically pledged to the Conservancy District and deposited with a qualified trustee by the financial institution as security for repayment whose market value at all times shall be at least 105 percent of deposits being secured; or

Participation in the Ohio Pooled Collateral System (OPCS), a collateral pool of eligible securities deposited with a qualified trustee and pledged to the Treasurer of State to secure the repayment of all public monies deposited in the financial institution. OPCS requires the local market value of the securities pledged to be 102 percent of the deposits being secured or a rate set by the Treasurer of State.

Cash on Hand

As of December 31, 2021, the Conservancy District had \$10,292 of cash on hand.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio

Notes to the Basic Financial Statements
For the Year Ended December 31, 2021

NOTE 3: DEPOSITS AND INVESTMENTS (continued)

Investments

As of December 31, 2021, the Conservancy District had the following investments and maturities:

Investment Type	Measurement Value	Investment Maturities			
		6 Months or Less	7 to 12 Months	13 to 24 Months	More than 24 Months
Federal Home Loan Mortgage Corporation	\$ 4,405,097	\$ 3,035,200	\$ -	\$ -	\$ 1,369,897
Federal National Mortgage Association	1,716,744	-	-	-	1,716,744
Federal Home Loan Bank	11,705,172	-	2,026,190	-	9,678,982
Federal Farm Credit Bank	7,057,816	-	508,058	1,037,224	5,512,534
Farmer Mac	2,023,566	2,023,566	-	-	-
Municipal Bonds	16,265,757	4,543,499	1,812,944	3,428,552	6,480,762
Money Market	708,158	708,158	-	-	-
Treasury Bonds	11,862,754	2,962,638	1,557,996	2,329,512	5,012,608
Negotiable CDs	10,016,605	1,733,304	1,711,498	2,215,240	4,356,563
Commercial Paper	2,499,947	2,499,947	-	-	-
	<u>\$68,261,616</u>	<u>\$17,506,312</u>	<u>\$7,616,686</u>	<u>\$9,010,528</u>	<u>\$34,128,090</u>

The Conservancy District categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset. Level 1 inputs are quoted prices in active markets for identical assets. Level 2 inputs are significant other observable inputs. Level 3 inputs are significant unobservable inputs. The above table identifies the Conservancy District's recurring fair value measurements as of December 31, 2021. All investments of the Conservancy District are valued using quoted market prices (Level 2 inputs).

Interest Rate Risk: As a means of limiting its exposure to fair value losses arising from rising interest rates and according to state law, the Conservancy District's investment policy limits portfolio maturities to five years or less.

Credit Risk: The FHLMC, FNMA, FHLB, FFCB, Farmer Mac and Treasuries all have Aaa or AA+ ratings from Moody's and S&P respectively. Nearly all of the securities carry the Aaa rating, which is the highest on the respective scales from Moody's. The Commercial paper is rated A-1, which is the highest rating on the scale for short term debt. Most of the municipal bond anticipation notes, and the money market funds are not rated by Moody's. The CDs are not rated by Moody's but are covered under the issuing bank FDIC.

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 3: DEPOSITS AND INVESTMENTS (continued)

Custodial Credit Risk: For an investment, custodial credit risk is the risk that, in the event of failure of the counterparty, the Conservancy District will not be able to recover the value of its investments or collateral securities that are in the possession of an outside party. The Conservancy District has no investment policy dealing with investment custodial risk beyond the requirement in the State statute that prohibits payment for the investments prior to the delivery of the securities representing such investments to the treasurer or qualified trustee.

Concentration of Credit Risk: The Conservancy District places no limit on the amount that may be invested in any one issuer. The following table includes the percentage to total of each investment type as of December 31, 2021.

Investment Type	Fair Value	Percent of Total
Federal Home Loan Mortgage Corporation	4,405,097	6%
Federal National Mortgage Association	1,716,744	3%
Federal Home Loan Bank	11,705,172	17%
Federal Farm Credit Bank	7,057,816	10%
Farmer Mac	2,023,566	3%
Municipal Bonds	16,265,758	24%
Money Market	708,157	1%
Treasury Bonds	11,862,754	17%
Negotiable CDs	10,016,605	15%
Commercial Paper	2,499,947	4%
	\$ 68,261,616	100%

The following is the net increase in the fair value of investments during for year ending December 31, 2021.

Fair Value of Investments December 31, 2021	\$ 68,261,616
Add: Proceeds of investments sold in 2021	40,690,699
Less: Cost of investments purchased in 2021	(43,918,801)
Less: Fair value at December 31, 2020	(66,272,346)
Change in fair value of investments	\$ (1,238,832)

NOTE 4: RECEIVABLES

Receivables at December 31, 2021 consisted of accounts (billed user charged services) and delinquent maintenance assessments. All receivables are deemed collectible in full.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Notes to the Basic Financial Statements
For the Year Ended December 31, 2021

NOTE 5: CAPITAL ASSETS

Proprietary capital assets – summary by category at December 31, 2021:

	12/31/2020	Adds	Deletions	12/31/2021
Capital Assets Not Being Depreciated				
Land	\$ 8,797,691	\$ 3,475,784	\$ -	\$ 12,273,475
CIP	27,540,660	9,829,535	(30,294,859)	7,075,336
Capitalized Development Costs	<u>1,189,495</u>	<u>-</u>	<u>-</u>	<u>1,189,495</u>
Total Capital Assets Not Depreciated	<u>37,527,846</u>	<u>13,305,319</u>	<u>(30,294,859)</u>	<u>20,538,306</u>
Capital Assets Being Depreciated				
Land Improvements	69,386,369	12,471,090	-	81,857,459
Buildings	36,712,415	9,778,862	-	46,491,277
Building Improvements	4,715,899	147,024	-	4,862,923
FFE	10,364,889	956,445	(107,053)	11,214,281
Vehicles	2,529,207	108,294	(77,754)	2,559,747
Infrastructure	<u>60,665,926</u>	<u>7,935,773</u>	<u>-</u>	<u>68,601,699</u>
Total Capital Assets being depreciated	<u>184,374,705</u>	<u>31,397,488</u>	<u>(184,807)</u>	<u>215,587,386</u>
Less Accumulated Depreciation				
Land Improvements	(8,854,085)	(3,473,669)	-	(12,327,754)
Buildings	(7,069,153)	(874,399)	-	(7,943,552)
Building Improvements	(1,732,698)	(186,608)	-	(1,919,306)
FFE	(7,567,137)	(968,293)	86,605	(8,448,825)
Vehicles	(2,235,973)	(138,130)	71,943	(2,302,160)
Infrastructure	<u>(10,293,896)</u>	<u>(3,120,803)</u>	<u>-</u>	<u>(13,414,699)</u>
Total Accumulated Depreciation	<u>(37,752,942)</u>	<u>(8,761,902)</u>	<u>158,548</u>	<u>(46,356,296)</u>
Total Capital Assets being depreciated, net	<u>146,621,763</u>	<u>22,635,586</u>	<u>(26,259)</u>	<u>169,231,090</u>
Capital Assets, net	<u>\$ 184,149,609</u>	<u>\$ 35,940,905</u>	<u>\$ (30,321,118)</u>	<u>\$ 189,769,396</u>

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 6: RISK MANAGEMENT

A. Comprehensive Liability Insurance

The Conservancy District belongs to the Ohio Plan Risk Management, Inc. (OPRM) (the "Plan"), a non-assessable, unincorporated non-profit association providing a formalized, jointly administered self-insurance risk management program and other administrative services to Ohio governments ("Members"). The Plan is legally separate from its member governments.

Pursuant to Section 2744.081 of the Ohio Revised Code, the plan provides property, liability, errors and omissions, law enforcement, automobile, excess liability, crime, surety and bond, inland marine and other coverages to its members sold through fourteen appointed independent agents in the State of Ohio.

OPRM coverage programs are developed specific to each member's risk management needs and the related premiums for coverage are determined through the application of uniform underwriting criteria addressing the member's exposure to loss. Effective November 1, 2017, the OPRM retained 47% of the premium losses on the first \$250,000 casualty treaty and 30% of the first \$1,000,000 property treaty. The OPRM is also participating in a property primary excess of loss treaty. This treaty reimburses the OPRM 30% for losses between \$200,000 and \$1,000,000. The reimbursement is based on the amount of loss between \$200,000 and \$1,000,000. Effective November 1, 2018, the OPRM's property retention remained unchanged, however, the Plan assumed 100% of the first \$250,000 casualty treaty. Effective November 1, 2019, the OPRM's property retention increased from 30% to 33%, while the casualty treaty remains unchanged and still assumes 100% of the first \$250,000 casualty treaty. Effective November 1, 2020, the OPRM's property retention increased from 33% to 55%, while the casualty treaty remains unchanged and still assumes 100% of the first \$250,000 casualty treaty. Members are only responsible for their self-retention (deductible) amounts, which vary from member to member. OPRM had 771 members as of December 31, 2020.

Plan members are responsible to notify the Plan of their intent to renew coverage by their renewal date. If a member chooses not to renew with the Plan, they have no other financial obligation to the Plan, but still need to promptly notify the Plan of any potential claims occurring during their membership period. The former member's covered claims, which occurred during their membership period, remain the responsibility of the Plan.

Settlement amounts did not exceed insurance coverage for the past three fiscal years. There has been no significant reductions in coverage from the prior year.

The Pool's audited financial statements conform with generally accepted accounting principles, and reported the following assets, liabilities and equity at December 31, 2020 (the latest information available).

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 6: RISK MANAGEMENT (continued)

	<u>2020</u>
Assets	\$18,826,974
Liabilities	<u>(13,530,267)</u>
Members' Equity	<u>\$ 5,296,707</u>

You can read the complete audited financial statements for OPRM at the Plan's website, www.ohioplan.org.

B. Self-insurance

Muskingum Watershed Conservancy District has a self-funded health insurance plan administered by third party administrator Aultcare. The 2020 plan year runs June 1, 2020 through May 31, 2021. The 2021 plan period runs June 1, 2021 through December 31, 2021. The Conservancy District has two plan options, the traditional (Plan A) and one with a higher deductible (Plan B).

The monthly premiums for 2020 and 2021 for the traditional plan (Plan A) for a single employee are \$599.39, \$1,249.06 for an employee plus 1, and for the family of an employee is \$1,933.08. The monthly premium for Plan B for a single employee is \$462.09, \$959.29 for an employee plus one, and for the family of an employee is \$1,483.43.

The overall stop loss for the plan year 2020 is \$1,851,405 and for plan year 2021 is \$1,043,439.

The specific stop loss per occurrence was \$65,000 for plan years 2020 and 2021. In plan years 2020 and 2021 there were two instances with a special specific deductible in the amount of \$555,000 and \$80,000. There was one claim exceeding the limit for plan year 2020. When the Conservancy District pays claims or reimburses employees for medical bills in excess of the limits they are reimbursed by Aultcare Insurance Company for both 2020 and 2021 plan years.

The claims liability of \$209,000 at December 31, 2021, is based on an estimate provided by the third party administrator and the requirements of Governmental Accounting Standards Board Statement No. 30 which requires that a liability for unpaid claim costs, including estimates of costs relating to incurred but not reported claims, be reported. The estimate was not affected by incremental claim adjustment expenses and does not include other allocated or unallocated claim adjustment expenses. Changes in claims liability for 2021 and 2020 are as follows:

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 6: RISK MANAGEMENT (continued)

		<u>Balance Beginning of Year</u>	<u>Current Year Claims</u>	<u>Claims Payments</u>	<u>Balance End of Year</u>
2020	\$	194,802	\$ 1,817,019	\$ 1,775,821	\$ 236,000
2021	\$	236,000	\$ 1,799,212	\$ 1,826,212	\$ 209,000

NOTE 7- DEFINED BENEFIT PENSION PLANS

The statewide retirement systems provide both pension benefits and other postemployment benefits (OPEB).

Net Pension Liability/Net OPEB Liability (Asset)

Pensions and OPEB are components of exchange transactions - between an employer and its employees - of salaries and benefits for employee services. Pensions and OPEB are provided to an employee - on a deferred-payment basis - as part of the total compensation package offered by an employer for employee services each financial period.

The net pension liability and the net OPEB liability (asset) represent the Conservancy District's proportionate share of each pension/OPEB plan's collective actuarial present value of projected benefit payments attributable to past periods of service, net of each pension plan's fiduciary net position. The net pension/OPEB liability (asset) calculation is dependent on critical long-term variables, including estimated average life expectancies, earnings on investments, cost of living adjustments and others. While these estimates use the best information available, unknowable future events require adjusting this estimate annually.

Ohio Revised Code limits the Conservancy District's obligation for this liability to annually required payments. The Conservancy District cannot control benefit terms or the manner in which pensions/OPEB are financed; however, the Conservancy District does receive the benefit of employees' services in exchange for compensation including pension and OPEB.

GASB 68/75 assumes the liability is solely the obligation of the employer, because (1) they benefit from employee services; and (2) State statute requires all funding to come from these employers. All contributions to date have come solely from these employers (which also includes costs paid in the form of withholdings from employees). The retirement systems may allocate a portion of the employer contributions to provide for these OPEB benefits. In addition, health care plan enrollees pay a portion of the health care costs in the form of a monthly premium. State statute requires the retirement systems to amortize unfunded liabilities within 30 years. If the amortization period exceeds 30 years, each retirement system's board must propose corrective action to the State legislature. Any resulting legislative change to benefits or funding could significantly affect the net pension/OPEB liability (asset). Resulting adjustments to the net pension/OPEB liability (asset) would be effective when the changes are legally enforceable. The Ohio Revised Code

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 7- DEFINED BENEFIT PENSION PLANS (continued)

permits, but does not require the retirement systems to provide health care to eligible benefit recipients.

The proportionate share of each plan's unfunded benefits is presented as a long-term *net pension liability* and *net OPEB liability (asset)*. Any liability for the contractually-required pension/OPEB contributions outstanding at the end of the year is included in due to other governments.

The remainder of this note includes the pension disclosures. See Note 8 for the OPEB disclosures.

Plan Description – Ohio Public Employees Retirement System (OPERS)

Conservancy District employees participate in the Ohio Public Employees Retirement System (OPERS). OPERS administers three separate pension plans. The traditional pension plan is a cost-sharing, multiple-employer defined benefit pension plan. The member-directed plan is a defined contribution plan, and the combined plan is a combination cost-sharing, multiple-employer defined benefit/defined contribution pension plan. While members (e.g. Conservancy District employees) may elect the member-directed plan and the combined plan, substantially all employee members are in OPERS' traditional plan; therefore, the following disclosure focuses on the traditional pension plan.

OPERS provides retirement, disability, survivor and death benefits, and annual cost-of-living adjustments to members of the traditional plan. Authority to establish and amend benefits is provided by Chapter 145 of the Ohio Revised Code. OPERS issues a stand-alone financial report that includes financial statements, required supplementary information and detailed information about OPERS' fiduciary net position that may be obtained by visiting <https://www.opers.org/financial/reports.shtml>, by writing to the Ohio Public Employees Retirement System, 277 East Town Street, Columbus, Ohio 43215-4642, or by calling 800-222-7377.

Senate Bill (SB) 343 was enacted into law with an effective date of January 7, 2013. In the legislation, members were categorized into three groups with varying provisions of the law applicable to each group. The following table provides age and service requirements for retirement and the retirement formula applied to final average salary (FAS) for the three member groups under the traditional plan as per the reduced benefits adopted by SB 343 (see OPERS ACFR referenced above for additional information, including requirements for reduced and unreduced benefits):

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Notes to the Basic Financial Statements
For the Year Ended December 31, 2021

NOTE 7- DEFINED BENEFIT PENSION PLANS (continued)

Group A	Group B	Group C
Eligible to retire prior to January 7, 2013 or five years after January 7, 2013	20 years of service credit prior to January 7, 2013 or eligible to retire ten years after January 7, 2013	Members not in other Groups and members hired on or after January 7, 2013
State and Local	State and Local	State and Local
Age and Service Requirements: Age 60 with 60 months of service credit or Age 55 with 25 years of service credit	Age and Service Requirements: Age 60 with 60 months of service credit or Age 55 with 25 years of service credit	Age and Service Requirements: Age 57 with 25 years of service credit or Age 62 with 5 years of service credit
Formula: 2.2% of FAS multiplied by years of service for the first 30 years and 2.5% for service years in excess of 30	Formula: 2.2% of FAS multiplied by years of service for the first 30 years and 2.5% for service years in excess of 30	Formula: 2.2% of FAS multiplied by years of service for the first 35 years and 2.5% for service years in excess of 35
Public Safety	Public Safety	Public Safety
Age and Service Requirements: Age 48 with 25 years of service credit or Age 52 with 15 years of service credit	Age and Service Requirements: Age 48 with 25 years of service credit or Age 52 with 15 years of service credit	Age and Service Requirements: Age 52 with 25 years of service credit or Age 56 with 15 years of service credit
Law Enforcement	Law Enforcement	Law Enforcement
Age and Service Requirements: Age 52 with 15 years of service credit	Age and Service Requirements: Age 48 with 25 years of service credit or Age 52 with 15 years of service credit	Age and Service Requirements: Age 48 with 25 years of service credit or Age 56 with 15 years of service credit
Public Safety and Law Enforcement	Public Safety and Law Enforcement	Public Safety and Law Enforcement
Formula: 2.5% of FAS multiplied by years of service for the first 25 years and 2.1% for service years in excess of 25	Formula: 2.5% of FAS multiplied by years of service for the first 25 years and 2.1% for service years in excess of 25	Formula: 2.5% of FAS multiplied by years of service for the first 25 years and 2.1% for service years in excess of 25

Final average salary (FAS) represents the average of the three highest years of earnings over a member's career for Groups A and B. Group C is based on the average of the five highest years of earnings over a member's career.

Members who retire before meeting the age and years of service credit requirement for unreduced benefits receive a percentage reduction in the benefit amount. The initial amount of a member's pension benefit is vested upon receipt of the initial benefit payment for calculation of an annual cost-of-living adjustment.

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 7- DEFINED BENEFIT PENSION PLANS (continued)

When a benefit recipient has received benefits for 12 months, current law provides for an annual cost-of-living adjustment (COLA). This COLA is calculated on the original base retirement benefit at the date of retirement and is not compounded. For those who retired prior to January 7, 2013, the COLA is 3 percent. For those retiring on or after January 7, 2013, beginning in calendar year 2019, current law provides that the COLA will be based on the average percentage increase in the Consumer Price Index (CPI), capped at 3 percent.

Beginning in 2022, the Combined Plan will be consolidated under the Traditional Pension Plan (defined benefit plan) and the Combined Plan option will no longer be available for new hires beginning in 2022.

Funding Policy - Ohio Revised Code (ORC) provides statutory authority for member and employer contributions as follows:

	<u>State and Local</u>	<u>Public Safety</u>	<u>Law Enforcement</u>
2021 Statutory Maximum Contribution Rates			
Employer	14.00 %	18.10 %	18.10 %
Employee	10.00 %	*	**
2021 Actual Contribution Rates			
Employer:			
Pension	14.00 %	18.10 %	18.10 %
Post-Employment Health Care Benefits	<u>0.00 %</u>	<u>0.00 %</u>	<u>0.00 %</u>
Total Employer	<u>14.00 %</u>	<u>18.10 %</u>	<u>18.10 %</u>
Employee	<u>10.00 %</u>	<u>12.00 %</u>	<u>13.00 %</u>

* This rate is determined by OPERS' Board and has no maximum rate established by ORC.

** This rate is also determined by OPERS' Board, but is limited by ORC to not more than 2 percent greater than the Public Safety rate.

Employer contribution rates are actuarially determined and are expressed as a percentage of covered payroll. The Conservancy District's contractually required contribution was \$1,059,038 for 2021. Of this amount, \$82,082 is reported as due to other governments.

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 7- DEFINED BENEFIT PENSION PLANS (continued)

Pension Liabilities, Pension Expense, and Deferred Outflows/Inflows of Resources Related to Pensions

The net pension liability for OPERS was measured as of December 31, 2020, and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation as of that date. The Conservancy District's proportion of the net pension liability was based on the Conservancy District's share of contributions to the pension plan relative to the contributions of all participating entities. Following is information related to the proportionate share and pension expense:

	<u>OPERS</u>
Proportion of the Net Pension Liability:	
Current Measurement Period	0.053880%
Prior Measurement Period	<u>0.054542%</u>
Change in Proportion	<u><u>-0.000662%</u></u>
Proportionate Share of the Net	
Pension Liability	\$ 7,978,455
Pension Expense	\$ (144,891)

Other than contributions made subsequent to the measurement date and differences between projected and actual earnings on investments; deferred inflows/outflows of resources are recognized in pension expense beginning in the current period, using a straight line method over a closed period equal to the average of the expected remaining services lives of all employees that are provided with pensions, determined as of the beginning of the measurement period. Net deferred inflows/outflows of resources pertaining to the differences between projected and actual investment earnings are similarly recognized over a closed five year period. At December 31, 2021, the Conservancy District reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Notes to the Basic Financial Statements
For the Year Ended December 31, 2021

NOTE 7- DEFINED BENEFIT PENSION PLANS (continued)

	OPERS
Deferred Outflows of Resources	
Conservancy District Contributions Subsequent to the Measurement Date	\$ 1,059,038
Total Deferred Outflows of Resources	\$ 1,059,038
Deferred Inflows of Resources	
Differences between Expected and Actual Experience	\$ 333,745
Net Difference between Projected and Actual Earnings on Pension Plan Investments	3,109,770
Changes in Proportionate Share and Differences in Contributions	182,054
Total Deferred Inflows of Resources	\$ 3,625,569

\$1,059,038 reported as deferred outflows of resources related to pension resulting from Conservancy District contributions subsequent to the measurement date will be recognized as a reduction of the net pension liability in the year ending December 31, 2022. Other amounts reported as deferred outflows of resources and deferred inflows of resources related to pension will be recognized in pension expense as follows:

Year Ending December 31:	OPERS
2022	\$ (1,464,134)
2023	(469,663)
2024	(1,267,647)
2025	(424,125)
	\$ (3,625,569)

Actuarial Assumptions - OPERS

Actuarial valuations of an ongoing plan involve estimates of the values of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality, and cost trends. Actuarially determined amounts are subject to continual review or modification as actual results are compared with past expectations and new estimates are made about the future.

Projections of benefits for financial reporting purposes are based on the substantive plan (the plan as understood by the employers and plan members) and include the types of benefits provided at the time of each valuation. The total pension liability was determined by an actuarial valuation as of December 31, 2020, using the following key actuarial assumptions and methods applied to all prior periods included in the measurement in accordance with the requirements of GASB 67.

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 7- DEFINED BENEFIT PENSION PLANS (continued)

Key methods and assumptions used in the latest actuarial valuation, reflecting experience study results, prepared as of December 31, 2020 are presented below.

<u>Actuarial Information</u>	<u>Traditional Pension Plan</u>
Wage Inflation	3.25 percent
Future Salary Increases, including wage inflation	3.25 percent to 10.75 percent (including wage inflation)
Investment Rate of Return	
Current Measurement Date	7.20 percent
Prior Measurement Date	7.20 percent
Actuarial Cost Method	Individual Entry Age
Cost-of-Living	Pre-1/7/2013 Retirees: 3.00 percent Simple
Adjustments	Post-1/7/2013 Retirees: 0.50 percent Simple through 2021, then 2.15 percent Simple

In October 2020, the OPERS Board adopted a change in COLA for post-January 7, 2013 retirees, changing it from 1.4 percent simple through 2020 then 2.15 simple to 0.5 percent simple through 2021 then 2.15 percent simple.

Pre-retirement mortality rates are based on the RP-2014 Employees mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates are based on the RP-2014 Healthy Annuitant mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates for disabled retirees are based on the RP-2014 Disabled mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Mortality rates for a particular calendar year are determined by applying the MP-2015 mortality improvement scale to all of the above described tables.

The most recent experience study was completed for the five year period ended December 31, 2015.

The allocation of investment assets with the Defined Benefit portfolio is approved by the Board of Trustees as outlined in the annual investment plan. Plan assets are managed on a total return basis with a long-term objective of achieving and maintaining a fully funded status for the benefits provided through the defined benefit pension plans. The long-term expected rate of return on defined benefit investment assets was determined using a building-block method in which best-

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Notes to the Basic Financial Statements
For the Year Ended December 31, 2021

NOTE 7- DEFINED BENEFIT PENSION PLANS (continued)

estimate ranges of expected future real rates of return are developed for each major asset class. These ranges are combined to produce the long-term expected real rate of return by weighting the expected future real rates of return by the target asset allocation percentage, adjusted for inflation. Best estimates of arithmetic real rates of return were provided by the Board's investment consultant. For each major asset class that is included in the Defined Benefit portfolio's target asset allocation as of December 31, 2020, these best estimates are summarized in the following table:

<u>Asset Class</u>	<u>Target Allocation</u>	<u>Weighted Average Long-Term Expected Real Rate of Return (Arithmetic)</u>
Fixed Income	25.00 %	1.32 %
Domestic Equities	21.00	5.64
Real Estate	10.00	5.39
Private Equity	12.00	10.42
International Equities	23.00	7.36
Other Investments	<u>9.00</u>	<u>4.75</u>
Total	<u>100.00%</u>	<u>5.43 %</u>

Discount Rate The discount rate used to measure the total pension liability was 7.20 percent. The projection of cash flows used to determine the discount rate assumed that contributions from plan members and those of the contributing employers are made at the contractually required rates, as actuarially determined. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the Conservancy District's Proportionate Share of the Net Pension Liability to Changes in the Discount Rate The following table presents the Conservancy District's proportionate share of the net pension liability calculated using the discount rate of 7.20 percent and the Conservancy District's proportionate share of the net pension liability if it were calculated using a discount rate that is one percent lower (6.20 percent) or one percent higher (8.20 percent) than the current rate:

	<u>1% Decrease</u>	<u>Current Discount Rate</u>	<u>1% Increase</u>
Conservancy District's Proportionate Share of the Net Pension Liability	\$ 15,218,945	\$ 7,978,455	\$ 1,957,999

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 7- DEFINED BENEFIT PENSION PLANS (continued)

Changes between Measurement Date and Report Date During 2021, the OPERS Board lowered the investment rate of return from 7.2 percent to 6.9 percent along with certain other changes to assumptions for the actuarial valuation as of December 31, 2021. The effects of these changes are unknown.

NOTE 8 - DEFINED BENEFIT OPEB PLANS

See Note 7 for a description of the net OPEB liability (asset).

Plan Description – Ohio Public Employees Retirement System (OPERS)

OPERS administers three separate pension plans: the traditional pension plan, a cost-sharing, multiple-employer defined benefit pension plan; the member-directed plan, a defined contribution plan; and the combined plan, a cost-sharing, multiple-employer defined benefit pension plan that has elements of both a defined benefit and defined contribution plan.

OPERS maintains a cost-sharing, multiple-employer defined benefit post-employment health care trust, which funds multiple health care plans including medical coverage, prescription drug coverage and deposits to a Health Reimbursement Arrangement (HRA) to qualifying benefit recipients of both the traditional pension and the combined plans. Currently, Medicare-eligible retirees are able to select medical and prescription drug plans from a range of options and may elect optional vision and dental plans. Retirees and eligible dependents enrolled in Medicare Parts A and B have the option to enroll in a Medicare supplemental plan with the assistance of the OPERS Medicare Connector. The OPERS Medicare Connector is a relationship with a vendor selected by OPERS to assist retirees, spouses and dependents with selecting a medical and pharmacy plan. Monthly allowances, based on years of service and the age at which the retiree first enrolled in OPERS coverage, are deposited into an HRA. For non-Medicare retirees and eligible dependents, OPERS sponsors medical and prescription coverage through a professionally managed self-insured plan. An allowance to offset a portion of the monthly premium is offered to retirees and eligible dependents. The allowance is based on the retiree's years of service and age when they first enrolled in OPERS coverage.

Medicare-eligible retirees who choose to become re-employed or survivors who become employed in an OPERS-covered position are prohibited from participating in an HRA. For this group of retirees, OPERS sponsors secondary coverage through a professionally managed self-insured program. Retirees who enroll in this plan are provided with a monthly allowance to offset a portion of the monthly premium. Medicare-eligible spouses and dependents can also enroll in this plan as long as the retiree is enrolled.

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 8 - DEFINED BENEFIT OPEB PLANS (continued)

OPERS provides a monthly allowance for health care coverage for eligible retirees and their eligible dependents. The base allowance is determined by OPERS.

The health care trust is also used to fund health care for member-directed plan participants, in the form of a Retiree Medical Account (RMA). At retirement or separation, member directed plan participants may be eligible for reimbursement of qualified medical expenses from their vested RMA balance.

Effective January 1, 2022, OPERS will discontinue the group plans currently offered to non-Medicare retirees and re-employed retirees. Instead, eligible non-Medicare retirees will select an individual medical plan. OPERS will provide a subsidy or allowance via an HRA allowance to those retirees who meet health care eligibility requirements. Retirees will be able to seek reimbursement for plan premiums and other qualified medical expenses. These changes are reflected in the December 31, 2020, measurement date health care valuation.

In order to qualify for postemployment health care coverage, age and service retirees under the traditional pension and combined plans must have twenty or more years of qualifying Ohio service credit with a minimum age of 60, or generally 30 years of qualifying service at any age. Health care coverage for disability benefit recipients and qualified survivor benefit recipients is available. Current retirees eligible (or who become eligible prior to January 1, 2022) to participate in the OPERS health care program will continue to be eligible after January 1, 2022. Eligibility requirements will change for those retiring after January 1, 2022, with differing eligibility requirements for Medicare retirees and non-Medicare retirees. The health care coverage provided by OPERS meets the definition of an Other Post Employment Benefit (OPEB) as described in GASB Statement 75. See OPERS' Annual Comprehensive Financial Report referenced below for additional information.

The Ohio Revised Code permits, but does not require OPERS to provide health care to its eligible benefit recipients. Authority to establish and amend health care coverage is provided to the Board in Chapter 145 of the Ohio Revised Code.

Disclosures for the health care plan are presented separately in the OPERS financial report. Interested parties may obtain a copy by visiting <https://www.opers.org/financial/reports.shtml>, by writing to OPERS, 277 East Town Street, Columbus, Ohio 43215-4642, or by calling (614) 222-5601 or 800-222-7377.

Funding Policy - The Ohio Revised Code provides the statutory authority allowing public employers to fund postemployment health care through their contributions to OPERS. When funding is approved by OPERS' Board of Trustees, a portion of each employer's contribution to OPERS is set aside to fund OPERS health care plans. Beginning in 2018, OPERS no longer allocated a portion of its employer contributions to health care for the traditional plan and the combined plan.

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 8 - DEFINED BENEFIT OPEB PLANS (continued)

Employer contribution rates are expressed as a percentage of the earnable salary of active members. In 2021, state and local employers contributed at a rate of 14.0 percent of earnable salary and public safety and law enforcement employers contributed at 18.1 percent. These are the maximum employer contribution rates permitted by the Ohio Revised Code. Active member contributions do not fund health care.

Each year, the OPERS Board determines the portion of the employer contribution rate that will be set aside to fund health care plans. For 2021, OPERS did not allocate any employer contribution to health care for members in the Traditional Pension Plan and Combined Plan. The OPERS Board is also authorized to establish rules for the retiree or their surviving beneficiaries to pay a portion of the health care provided. Payment amounts vary depending on the number of covered dependents and the coverage selected. The employer contribution as a percentage of covered payroll deposited into the RMA for participants in the member-directed plan for 2021 was 4.0 percent.

Employer contribution rates are actuarially determined and are expressed as a percentage of covered payroll. The Conservancy District's contractually required contribution was \$0 for 2021.

OPEB Liability (Asset), OPEB Expense, and Deferred Outflows/Inflows of Resources Related to OPEB

The net OPEB liability (asset) and total OPEB liability for OPERS were determined by an actuarial valuation as of December 31, 2019, rolled forward to the measurement date of December 31, 2020, by incorporating the expected value of health care cost accruals, the actual health care payment, and interest accruals during the year. The Conservancy District's proportion of the net OPEB liability (asset) was based on the Conservancy District's share of contributions to the retirement plan relative to the contributions of all participating entities. Following is information related to the proportionate share and OPEB expense:

	OPERS
Proportion of the Net OPEB Liability (Asset):	
Current Measurement Period	0.053587%
Prior Measurement Period	0.053812%
Change in Proportion	-0.000225%
Proportionate Share of the Net	
OPEB Liability (Asset)	\$ (954,695)
OPEB Expense	\$ (5,889,100)

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 8 - DEFINED BENEFIT OPEB PLANS (continued)

At December 31, 2021, the Conservancy District reported deferred outflows of resources and deferred inflows of resources related to OPEB from the following sources:

	OPERS
Deferred Outflows of Resources	
Changes of Assumptions	\$ 469,341
Changes in Proportionate Share and Differences in Contributions	553
Total Deferred Outflows of Resources	\$ 469,894
Deferred Inflows of Resources	
Differences between Expected and Actual Experience	\$ 861,606
Net Difference between Projected and Actual Earnings on OPEB Plan Investments	508,484
Changes of Assumptions	1,546,892
Changes in Proportionate Share and Differences in Contributions	87,526
Total Deferred Inflows of Resources	\$ 3,004,508

Amounts reported as deferred outflows of resources and deferred inflows of resources related to OPEB will be recognized in OPEB expense as follows:

Year Ending December 31:	OPERS
2022	\$ (1,357,512)
2023	(896,219)
2024	(220,967)
2025	(59,916)
	\$ (2,534,614)

Actuarial Assumptions - OPERS

Actuarial valuations of an ongoing plan involve estimates of the values of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality, and cost trends. Actuarially determined amounts are subject to continual review or modification as actual results are compared with past expectations and new estimates are made about the future.

Projections of benefits for financial reporting purposes are based on the substantive plan (the plan as understood by the employers and plan members) and include the types of coverage provided at the time of each valuation and the historical pattern of sharing of costs between OPERS and plan members. The total OPEB liability was determined by an actuarial valuation as of December 31, 2019, rolled forward to the measurement date of December 31, 2020. The

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 8 - DEFINED BENEFIT OPEB PLANS (continued)

actuarial valuation used the following actuarial assumptions applied to all prior periods included in the measurement in accordance with the requirements of GASB 74:

Wage Inflation	3.25 percent
Projected Salary Increases, Including Inflation	3.25 percent to 10.75 percent (includes wage inflation at 3.25 percent)
Single Discount Rate:	
Current Measurement Date	6.00 percent
Prior Measurement Date	3.16 percent
Investment Rate of Return	
Current Measurement Date	6.00 percent
Prior Measurement Date	6.00 percent
Municipal Bond Rate	
Current Measurement Date	2.00 percent
Prior Measurement Date	2.75 percent
Health Care Cost Trend Rate	
Current Measurement Date	8.50 percent, initial, 3.50 percent ultimate in 2035
Prior Measurement Date	10.50 percent, initial, 3.50 percent ultimate in 2030
Actuarial Cost Method	Individual Entry Age Normal

Pre-retirement mortality rates are based on the RP-2014 Employees mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Postretirement mortality rates are based on the RP-2014 Healthy Annuitant mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Postretirement mortality rates for disabled retirees are based on the RP-2014 Disabled mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Mortality rates for a particular calendar year are determined by applying the MP-2015 mortality improvement scale to all of the above described tables.

The most recent experience study was completed for the five year period ended December 31, 2015.

The allocation of investment assets within the Health Care portfolio is approved by the Board of Trustees as outlined in the annual investment plan. Assets are managed on a total return basis with a long-term objective of continuing to offer a sustainable health care program for current and future retirees. OPERS' primary goal is to achieve and maintain a fully funded status for the benefits provided through the defined pension plans. Health care is a discretionary benefit. The

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 8 - DEFINED BENEFIT OPEB PLANS (continued)

long-term expected rate of return on health care investment assets was determined using a building-block method in which best-estimate ranges of expected future real rates of return are developed for each major asset class. These ranges are combined to produce the long-term expected real rate of return by weighting the expected future real rates of return by the target asset allocation percentage, adjusted for inflation. Best estimates of arithmetic rates of return were provided by OPERS investment consultant.

For each major asset class that is included in the Health Care's portfolio's target asset allocation as of December 31, 2020, these best estimates are summarized in the following table:

<u>Asset Class</u>	<u>Target Allocation</u>	<u>Weighted Average Long-Term Expected Real Rate of Return (Arithmetic)</u>
Fixed Income	34.00 %	1.07 %
Domestic Equities	25.00	5.64
Real Estate Investment Trusts	7.00	6.48
International Equities	25.00	7.36
Other Investments	<u>9.00</u>	<u>4.02</u>
Total	<u>100.00%</u>	<u>4.43 %</u>

Discount Rate A single discount rate of 6.00 percent was used to measure the total OPEB liability on the measurement date of December 31, 2020. A single discount rate of 3.16 percent was used to measure the total OPEB liability on the measurement date of December 31, 2019. Projected benefit payments are required to be discounted to their actuarial present value using a single discount rate that reflects (1) a long-term expected rate of return on OPEB plan investments (to the extent that the health care fiduciary net position is projected to be sufficient to pay benefits), and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate are not met). This single discount rate was based on an expected rate of return on the health care investment portfolio of 6.00 percent and a municipal bond rate of 2.00 percent (Fidelity Index's "20-Year Municipal GO AA Index"). The projection of cash flows used to determine this single discount rate assumed that employer contributions will be made at rates equal to the actuarially determined contribution rate. Based on these assumptions, the health care fiduciary net position and future contributions were sufficient to finance health care costs through 2120. As a result, the actuarial assumed long-term expected rate of return on health care investments was applied to projected costs through the year 2120, the duration of the projection period through which projected health care payments are fully funded.

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 8 - DEFINED BENEFIT OPEB PLANS (continued)

Sensitivity of the Conservancy District's Proportionate Share of the Net OPEB Liability (Asset) to Changes in the Discount Rate The following table presents the Conservancy District's proportionate share of the net OPEB liability (asset) calculated using the single discount rate of 6.00 percent and the Conservancy District's proportionate share of the net OPEB liability (asset) if it were calculated using a discount rate that is one percent lower (5.00 percent) or one percent higher (7.00 percent) than the current rate:

	1% Decrease	Current Discount Rate	1% Increase
Conservancy District's Proportionate Share of the Net OPEB (Asset)	\$ (237,390)	\$ (954,695)	\$ (1,544,377)

Sensitivity of the Conservancy District's Proportionate Share of the Net OPEB Liability (Asset) to Changes in the Health Care Cost Trend Rate Changes in the health care cost trend rate may also have a significant impact on the net OPEB liability (asset). The following table presents the net OPEB liability (asset) calculated using the assumed trend rates, and the expected net OPEB liability (asset) if it were calculated using a health care cost trend rate that is 1.0 percent lower or 1.0 percent higher than the current rate.

Retiree health care valuations use a health care cost-trend assumption that changes over several years built into the assumption. The near-term rates reflect increases in the current cost of health care; the trend starting in 2021 is 8.50 percent. If this trend continues for future years, the projection indicates that years from now virtually all expenditures will be for health care. A more reasonable alternative is that in the not-too-distant future, the health plan cost trend will decrease to a level at, or near, wage inflation. On this basis, the actuaries project premium rate increases will continue to exceed wage inflation for approximately the next decade, but by less each year, until leveling off at an ultimate rate, assumed to be 3.50 percent in the most recent valuation.

	1% Decrease	Current Trend Rate	1% Increase
Conservancy District's Proportionate Share of the Net OPEB (Asset)	\$ (977,963)	\$ (954,695)	\$ (928,663)

Changes between Measurement Date and Report Date During 2021, the OPERS Board made various changes to assumptions for the actuarial valuation as of December 31, 2021. The effects of these changes are unknown.

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 9: LEGAL PROCEEDINGS

The Conservancy District is involved in litigation in the normal course of business. Although the eventual outcome of these matters cannot be predicted, it is the opinion of management that the ultimate liability is not expected to have a material effect on the Conservancy District's financial position.

NOTE 10: LONG-TERM OBLIGATIONS

The changes in the Conservancy District's long-term obligations during the fiscal year 2021 were as follows:

OWDA #2162 - 5.56%	\$ 128,898	\$ 0	\$ (34,339)	\$ 94,559	\$ 36,275
OWDA #5413 - 0%	85,000	0	(9,444)	75,556	9,444
OWDA #5575 - 3.25%	350,914	0	(32,085)	318,829	33,136
OWDA #5558 - 3.25%	15,933	0	(1,551)	14,382	1,602
<i>Total</i>	<u>580,745</u>	<u>-</u>	<u>(77,419)</u>	<u>503,326</u>	<u>80,457</u>

Other Long Term Obligations:

Capital Leases	204,656	149,288	(121,230)	232,714	80,943
Net OPEB Liability - See note 8	7,432,835	0	(7,432,835)	-	0
Net Pension Liability - See note 7	10,780,596	0	(2,802,141)	7,978,455	0
Compensated Absences	1,127,766	223,524	(142,964)	1,208,326	150,754
Total other long-term obligations	<u>19,545,853</u>	<u>372,812</u>	<u>(10,499,170)</u>	<u>9,419,495</u>	<u>231,697</u>

<i>Total Long-Term Liabilities:</i>	<u>\$ 20,126,598</u>	<u>\$ 372,812</u>	<u>\$(10,576,589)</u>	<u>\$ 9,922,821</u>	<u>\$ 312,154</u>
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Ohio Water Development Authority Loans

In 1999, the Conservancy District was awarded a loan (#2162) from the Ohio Water Development Authority (OWDA) in the amount of \$550,692. The proceeds of this loan are for the construction of a 75,000 and 10,000 gallon water tank. Also, a 3,807 linear feet of 6" water line and 3,676 linear feet of 4" water line are being constructed with these proceeds. All construction is at Tappan Lake Park. This loan agreement has a term of twenty-five years and matures July 1, 2024. Principal and interest payments are due January 1 and July 1, annually.

In 2009 the Conservancy District was awarded a loan (#5413) from OWDA in the amount of \$188,884. The proceeds of this loan were used for painting of a water tower. The loan is interest-free and matures on January 1, 2030.

In 2010, the Conservancy District was awarded a loan (#5575) from OWDA in the amount of \$637,001 for improvements to the Sites Lake Cottage Area wastewater treatment plant. The loan has an interest rate of 3.25 percent and matures on July 1, 2030.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio

Notes to the Basic Financial Statements
For the Year Ended December 31, 2021

NOTE 10: LONG-TERM OBLIGATIONS (continued)

The Conservancy District was awarded a \$30,065 loan from OWDA (#5558) in 2010 for an abandoned water well capping project. The loan has an interest rate of 3.25 percent and matures on January 1, 2030.

The annual requirements to retire debt are as follows:

	Ohio Water Development Authority Loans	
	<u>Principal</u>	<u>Interest</u>
2022	80,457	15,310
2023	83,640	12,126
2024	66,458	8,791
2025	47,709	7,022
2026	48,963	5,768
2027-2030	<u>176,099</u>	<u>9,710</u>
	<u>\$ 503,326</u>	<u>\$ 58,727</u>

In the event of default, as defined by each OWDA loan agreement, the lender may declare the full amount of the unpaid Project Participation Principal amount immediately due and payable and require the Conservancy District to pay any fines or penalties with accrued interest. The Conservancy District loans with OWDA are not collateralized.

NOTE 11: CAPITAL LEASES – LESSEE DISCLOSURE

The Conservancy District has entered into capitalized leases for the acquisition of vehicles and equipment. These leases meet the criteria of a capital lease as they transfer benefits and risks of ownership to the lessee.

The assets acquired by the leases have been capitalized in the amount of \$621,399, which is equal to the present value of the future minimum lease payments at the time of acquisition. Accumulated depreciation was \$329,772 as of December 31, 2021, leaving a current book value of \$291,627. A corresponding liability is recorded and is reduced for each required principal payment.

The following is a schedule of the future long-term minimum lease payments required under the capital leases and the present value of the minimum lease payments as of December 31, 2021:

**Muskingum Watershed Conservancy District
Tuscarawas County, Ohio**

*Notes to the Basic Financial Statements
For the Year Ended December 31, 2021*

NOTE 11: CAPITAL LEASES – LESSEE DISCLOSURE (continued)

		Capital Leases
Fiscal Year Ending December 31:	2022	\$ 102,148
	2023	75,145
	2024	56,030
	2025	29,917
	2026	18,330
Less: amount representing interest at the Conservancy District's incremental borrowing rate of interest		(48,856)
Present Value of minimum lease payments		\$ 232,714

NOTE 12: OPERATING LEASE

On June 17, 2011, the Conservancy District (as “Lessor”) entered into a lease agreement with Gulfport Energy Corporation (as “Lessee”) containing approximately 6,468 acres of land at Clendening Lake. A few months later on February 24, 2012 another lease was signed covering an additional forty-two acres (42.00 acres) of unleased “mineral” rights that were discovered through title. The total leasehold currently includes several producing wells paying royalties at rates of sixteen percent (16%) and eighteen percent (18%) with additional yearly delay rental payments for non-producing acreage.

On May 7, 2012, the Conservancy District (as “Lessor”) entered into a lease agreement with Chesapeake Exploration, L.L.C. (as “Lessee”) containing 3,700 acres at Leesville Lake. This leasehold currently includes several producing wells paying royalties at a rate of twenty percent (20%).

On October 19, 2012, the Conservancy District (as “Lessor”) entered into a lease agreement with Gulfport Energy (as “Lessee”) for an initial term of 5 years covering 1.3 acres of land at the north end of the Piedmont Reservoir. Two wells have been drilled to date under the terms of this lease agreement that are currently paying monthly royalties at a rate of twenty percent (20%).

On February 21, 2013, the Conservancy District (as “Lessor”) entered into a lease with Antero Resources (as “Lessee”) for an initial term of 5 years covering approximately 2,900 acres. Several producing wells were drilled under this lease and are currently paying monthly royalties at a rate of twenty percent (20%).

On April 22, 2014, the Conservancy District (as “Lessor”) entered into a lease with Antero Resources (as “Lessee”) for an initial term of 5 years covering 6,300 acres of land at Piedmont Reservoir. One well has been drilled under this lease and has since been plugged and abandoned. 933 acres of the original leasehold will be held until released by Antero.

On April 1, 2018, the Conservancy District (as “Lessor”) entered into a lease with Antero (as “Lessee”) Resources at Seneca Lake for an initial term of 3 years with the option to extend an

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Notes to the Basic Financial Statements
For the Year Ended December 31, 2021

NOTE 12: OPERATING LEASE (continued)

additional one-year term thereafter. On May 1, 2021, Antero exercised its option to extend this lease one additional year. This leasehold covers approximately 1,700 acres of land at Seneca Lake.

NOTE 13: CONTRACTUAL COMMITMENTS

As of December 31, 2021, the Conservancy District had contractual commitments for the following projects:

Project	Contractual Commitments	Expended	Balance 12/31/2021
Mohawk Dam USACE	\$ 2,124,663.00	\$ 1,676,761.48	\$ 447,901.52
Zoar Levee USACE	\$ 3,051,532.00	\$ 2,265,004.48	\$ 786,527.52
Atwood Cemetery Bay Connector Trail	\$ 633,217.53	\$ 424,214.22	\$ 209,003.31
Atwood West Marina Shower House Rehab.	\$ 528,907.00	\$ 101,933.92	\$ 426,973.08
Atwood Park Area 1/Pines Cottage Area Shoreline	\$ 697,755.80	\$ -	\$ 697,755.80
Pleasant Hill RV/Boat Storage Lot	\$ 509,591.44	\$ 244,728.47	\$ 264,862.97
Seneca Lake Dredging	\$ 4,232,380.87	\$ 3,977,574.33	\$ 254,806.54
Seneca Marina Shoreline and Site Improvements	\$ 1,113,735.00	\$ -	\$ 1,113,735.00
Tappan Marina Renovation	\$ 4,534,020.43	\$ 4,289,195.91	\$ 244,824.52
Tappan Marina Parking and Waterfront Improvements	\$ 905,256.10	\$ -	\$ 905,256.10

NOTE 14: SUBSEQUENT EVENTS

At the March 18, 2022, Board of Directors Meeting, the Board authorized staff to bid and award a construction contract for the Tappan Lake Park Welcome Center. The engineer's estimate for this project is \$2,600,000.

NOTE 15: BLENDED COMPONENT UNITS

Black Fork, Buffalo Creek, Chippewa and Duck Creek Subdivisions are blended component units under criteria of GASB Statement 61. The following represents combining financial statements for the year ended 2021.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Notes to the Basic Financial Statements
For the Year Ended December 31, 2021

NOTE 15: BLENDED COMPONENT UNITS (continued)

COMBINING STATEMENT OF NET POSITION

	Muskingum Watershed Conservancy District	Subdistricts				Eliminating Entries	Total
		Black Fork	Buffalo Creek	Chippewa	Duck Creek		
Assets							
<i>Current Assets:</i>							
Equity in Pooled Cash and Investments	\$ 69,855,962	\$ 0	\$ 0	\$ 637,893	\$8,377	\$ 0	\$ 70,502,232
Cash with Fiscal Agent	5,000,543	0	0	0	0	0	5,000,543
Accrued Interest	2,180	0	0	0	0	0	2,180
Accounts Receivable	832,130	0	0	0	0	(56,068)	776,062
Prepays	30,421	0	0	0	0	0	30,421
Maintenance Assessments Receivable	1,081,376	0	0	14,016	0	0	1,095,392
Total Current Assets	76,802,612	0	0	651,909	8,377	(56,068)	77,406,830
<i>Non-Current Assets:</i>							
Net OPEB Asset	954,695	0	0	0	0	0	954,695
Non-Depreciable Capital Assets	19,348,810	1,822	27,593	1,154,681	5,400	0	20,538,306
Depreciable Capital Assets, Net	169,154,949	0	0	76,141	0	0	169,231,090
Total Non-Current Assets	189,458,454	1,822	27,593	1,230,822	5,400	0	190,724,091
Total Assets	266,261,066	1,822	27,593	1,882,731	13,777	(56,068)	268,130,921
Deferred Outflows of Resources							
OPEB	469,894	0	0	0	0	0	469,894
Pension	1,059,038	0	0	0	0	0	1,059,038
Total Deferred Outflows of Resources	1,528,932	0	0	0	0	0	1,528,932
Liabilities							
<i>Current Liabilities:</i>							
Accounts Payable	248,105	1,822	27,593	41,826	6,037	(56,068)	269,315
Contracts Payable	435,260	0	0	0	0	0	435,260
Retainage Payable	373,049	0	0	0	0	0	373,049
Performance Bond Payable	106,698	0	0	0	0	0	106,698
Due to Other Governments	83,802	0	0	0	0	0	83,802
Accrued Wages and Benefits	169,969	0	0	0	0	0	169,969
Accrued Interest Payable	100	0	0	0	0	0	100
Accrued Life Insurance	18,903	0	0	0	0	0	18,903
Claims Payable	209,000	0	0	0	0	0	209,000
Advances	1,010,216	0	0	0	0	0	1,010,216
Compensated Absences	150,754	0	0	0	0	0	150,754
Capital Leases Payable	80,943	0	0	0	0	0	80,943
OWDA Loans Payable	80,457	0	0	0	0	0	80,457
Total Current Liabilities	2,967,256	1,822	27,593	41,826	6,037	(56,068)	2,988,466
<i>Long-Term Liabilities:</i>							
Compensated Absences - net of current portion	1,057,572	0	0	0	0	0	1,057,572
Capital Leases Payable - net of current portion	151,771	0	0	0	0	0	151,771
OWDA Loans Payable - net of current portion	422,869	0	0	0	0	0	422,869
Net OPEB Liability	0	0	0	0	0	0	0
Net Pension Liability	7,978,455	0	0	0	0	0	7,978,455
Total Long-Term Liabilities	9,610,667	0	0	0	0	0	9,610,667
Total Liabilities	12,577,923	1,822	27,593	41,826	6,037	(56,068)	12,599,133
Deferred Inflows of Resources							
OPEB	3,004,508	0	0	0	0	0	3,004,508
Pension	3,625,569	0	0	0	0	0	3,625,569
Total Deferred Inflows of Resources	6,630,077	0	0	0	0	0	6,630,077
Net Position							
Net Investment in Capital Assets	187,049,348	1,822	27,593	1,244,473	5,400	0	188,328,636
Restricted for Maintenance Assessment	14,012,173	0	0	596,432	0	0	14,608,605
Unrestricted	47,520,477	(1,822)	(27,593)	0	2,340	0	47,493,402
Total Net Position	\$ 248,581,998	\$ 0	\$ 0	\$ 1,840,905	\$7,740	\$ 0	\$ 250,430,643

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Notes to the Basic Financial Statements
For the Year Ended December 31, 2021

NOTE 15: BLENDED COMPONENT UNITS (continued)

COMBINING STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION

	Muskingum Watershed Conservancy District	Subdistricts				Eliminating Entries	Total
		Black Fork	Buffalo Creek	Chippewa	Duck Creek		
Operating Revenues							
Water Sales	\$ 200,519	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 200,519
Water and sewer systems	107,476	0	0	0	0	0	107,476
Timber Sales	302,842	0	0	0	0	0	302,842
Pine/Pulpwood Sales	71,949	0	0	0	0	0	71,949
Mineral rights and royalties	11,829,151	0	0	0	0	0	11,829,151
Share Crop	148,227	0	0	0	0	0	148,227
Cottage Sites and Clubs	3,152,455	0	0	0	0	0	3,152,455
Marina operations	2,651,088	0	0	0	0	0	2,651,088
Marina camping	552,421	0	0	0	0	0	552,421
Fishing rights	62,647	0	0	0	0	0	62,647
Beach facilities	198,886	0	0	0	0	0	198,886
Vacation cabin	860,779	0	0	0	0	0	860,779
Park camping	8,710,757	0	0	0	0	0	8,710,757
Parks - Special Events	204,610	0	0	0	0	0	204,610
Admissions - park facilities	233,085	0	0	0	0	0	233,085
Miscellaneous income	220,809	0	0	0	0	0	220,809
<i>Total Operating Revenues</i>	<u>29,507,701</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>29,507,701</u>
Operating Expenses							
Water Quality	631,539	0	0	0	0	0	631,539
Water Resources/Flood Control	586,894	0	0	0	0	0	586,894
Vehicles and equipment	597,504	0	0	0	0	0	597,504
Dam safety/upgrades	181,459	0	0	343,441	0	0	524,900
Boundary survey	25,838	0	0	0	0	0	25,838
Conservation	96,449	0	0	0	0	0	96,449
Reservoir Maintenance	51,001	0	0	0	0	0	51,001
Information Systems/Technology	493,796	0	0	0	0	0	493,796
Shoreline Protection	33,300	0	0	0	0	0	33,300
Share crop	38,680	0	0	0	0	0	38,680
Mineral operation	86,733	0	0	0	0	0	86,733
Watershed management	568,394	0	0	0	0	0	568,394
Beach facilities	110,087	0	0	0	0	0	110,087
Office building	213,953	0	0	0	0	0	213,953
Administrative and finance	1,527,159	0	0	0	0	0	1,527,159
Engineering	336,478	0	0	0	0	0	336,478
Planning and development	83,142	0	0	0	0	0	83,142
GIS and Parcel Development	9,934	0	0	0	0	0	9,934
Forestry maintenance	114,520	0	0	0	0	0	114,520
Park camping	2,009,319	0	0	0	0	0	2,009,319
Park Master Planning	1,448,908	0	0	0	0	0	1,448,908
Cottage sites and clubs	780,204	0	0	0	0	0	780,204
General park facilities	1,945,441	0	0	0	0	0	1,945,441
Vacation cabin	344,171	0	0	0	0	0	344,171
Marina operation	1,397,430	0	0	0	0	0	1,397,430

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Notes to the Basic Financial Statements
For the Year Ended December 31, 2021

NOTE 15: BLENDED COMPONENT UNITS (continued)

COMBINING STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION

	Muskingum Watershed Conservancy District	Subdistricts			Eliminating Entries	Total
		Black Fork	Buffalo Creek	Chippewa		
						(Continued)
Water and sewer system	\$ 395,250	\$ 0	\$ 0	\$ 0	\$ 0	\$ 395,250
Lake patrol operation	456,870	0	0	0	0	456,870
Education and public information	195,190	0	0	0	0	195,190
Safety expenses	121,950	0	0	0	0	121,950
Recreation maintenance	36,696	0	0	0	0	36,696
Parks - special events	148,388	0	0	0	0	148,388
Partners in Watershed Management (PWM)	511,243	0	0	0	0	511,243
Depreciation	<u>8,721,509</u>	<u>0</u>	<u>0</u>	<u>40,391</u>	<u>0</u>	<u>8,761,900</u>
<i>Total Operating Expenses</i>	<u>24,299,429</u>	<u>0</u>	<u>0</u>	<u>383,832</u>	<u>0</u>	<u>24,683,261</u>
<i>Operating Gain (Loss)</i>	5,208,272	0	0	(383,832)	0	4,824,440
Non-Operating Revenues (Expenses)						
Capital Contributions	936,000	0	0	0	0	936,000
Maintenance assessments	5,852,269	0	0	331,945	0	6,184,214
Grants	2,835,368	0	0	0	0	2,835,368
Interest on investments	(292,117)	0	0	0	0	(292,117)
Debt retirement - Interest	<u>(37,141)</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>(37,141)</u>
<i>Total Non-Operating Revenues (Expenses)</i>	<u>9,294,379</u>	<u>0</u>	<u>0</u>	<u>331,945</u>	<u>0</u>	<u>9,626,324</u>
<i>Change in Net Position</i>	14,502,651	0	0	(51,887)	0	14,450,764
Net Position - Beginning of Year	<u>234,079,347</u>	<u>0</u>	<u>0</u>	<u>1,892,792</u>	<u>7,740</u>	<u>235,979,879</u>
Net Position - End of Year	<u>\$ 248,581,998</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 1,840,905</u>	<u>\$ 7,740</u>	<u>\$ 250,430,643</u>

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Notes to the Basic Financial Statements
For the Year Ended December 31, 2021

NOTE 15: BLENDED COMPONENT UNITS (continued)

COMBINING STATEMENT OF CASH FLOWS

	Muskingum Watershed Conservancy District	Subdistricts				Eliminating Entries	Total
		Black Fork	Buffalo Creek	Chippewa	Duck Creek		
Cash flows from Operating Activities:							
Cash Received from Customers	\$ 30,020,318	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 30,020,318
Cash Payments to Suppliers for Goods and Services	(12,120,741)	0	0	(192,326)	0	0	(12,313,067)
Cash Payments for Employees Services and Benefits	(10,066,083)	0	0	(147,180)	0	0	(10,213,263)
<i>Net Cash Provided by (Used for) Operating Activities</i>	<u>7,833,494</u>	<u>0</u>	<u>0</u>	<u>(339,506)</u>	<u>0</u>	<u>0</u>	<u>7,493,988</u>
Cash Flows from Noncapital Financing Activities:							
Principal Payments on OWDA Loans	(10,995)	0	0	0	0	0	(10,995)
Intergovernmental Grants	19,681	0	0	0	0	0	19,681
Maintenance Assessments	3,660,539	0	0	302,455	0	0	3,962,994
Interest Paid on Debt	(466)	0	0	0	0	0	(466)
<i>Net Cash Provided by (Used for) Noncapital Financing Activities</i>	<u>3,668,759</u>	<u>0</u>	<u>0</u>	<u>302,455</u>	<u>0</u>	<u>0</u>	<u>3,971,214</u>
Cash Flows from Capital and Related Financing Activities:							
Acquisition of Capital Assets	(13,708,551)	0	0	(26,740)	0	0	(13,735,291)
Maintenance Assessments	2,188,525	0	0	26,740	0	0	2,215,265
Intergovernmental Grants	2,815,687	0	0	0	0	0	2,815,687
Principal Payments on OWDA Loans	(66,424)	0	0	0	0	0	(66,424)
Principal Payments on Capital Leases	(104,583)	0	0	0	0	0	(104,583)
Interest Paid on Debt	(36,675)	0	0	0	0	0	(36,675)
<i>Net Cash Provided by (Used) for Capital and Related Financing Activities</i>	<u>(8,912,021)</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>(8,912,021)</u>
Cash Flows from Investing Activities:							
Receipts of Interest	946,963	0	0	0	0	0	946,963
Payments for Purchase of Investments	(43,918,801)	0	0	0	0	0	(43,918,801)
Proceeds from Sale of Investments	40,690,699	0	0	0	0	0	40,690,699
<i>Net Cash Provided by (Used for) Investing Activities</i>	<u>(2,281,139)</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>(2,281,139)</u>
<i>Net Increase (Decrease) in Cash and Cash Equivalents</i>	309,093	0	0	(37,051)	0	0	272,042
<i>Cash and Cash Equivalents Beginning of Year</i>	<u>6,285,796</u>	<u>0</u>	<u>0</u>	<u>674,944</u>	<u>8,377</u>	<u>0</u>	<u>6,969,117</u>
<i>Cash and Cash Equivalents End of Year</i>	<u>\$ 6,594,889</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 637,893</u>	<u>\$ 8,377</u>	<u>\$ 0</u>	<u>\$ 7,241,159</u>
Reconciliation of Operating Gain (Loss) To Net Cash Used by Operating Activities:							
Operating Gain (Loss)	\$ 5,208,272	\$ 0	\$ 0	\$ (383,832)	\$ 0	\$ 0	\$ 4,824,440
Adjustments to Reconcile Operating Income to Net Cash Provided by Operating Activities:							
Depreciation	8,721,509	0	0	40,391	0	0	8,761,900
(Increase) Decrease in Assets and Deferred Outflows:							
Capitalized Costs	587,285	0	0	0	0	0	587,285
Accounts Receivable	101,266	0	0	0	0	0	101,266
Prepays	9,679	0	0	0	0	0	9,679
Net OPEB Asset	(954,695)	0	0	0	0	0	(954,695)
Deferred Outflows	1,324,945	0	0	0	0	0	1,324,945
Increase (Decrease) in Liabilities and Deferred Inflows:							
Accounts Payable	(211,622)	0	0	3,935	0	0	(207,687)
Performance Bonds payable	(16,359)	0	0	0	0	0	(16,359)
Escrow Funds Payable	7,894	0	0	0	0	0	7,894
Advances	411,350	0	0	0	0	0	411,350
Claims Payable	(27,001)	0	0	0	0	0	(27,001)
Accrued Wages and Benefits	36,387	0	0	0	0	0	36,387
Accrued Life Insurance	14,645	0	0	0	0	0	14,645
Compensated Absences	80,560	0	0	0	0	0	80,560
Due to other governments	2,658	0	0	0	0	0	2,658
Net OPEB Liability	(7,432,835)	0	0	0	0	0	(7,432,835)
Net Pension Liability	(2,802,141)	0	0	0	0	0	(2,802,141)
Deferred Inflows	2,771,697	0	0	0	0	0	2,771,697
<i>Net Cash Provided by (Used for) Operating Activities</i>	<u>\$ 7,833,494</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ (339,506)</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 7,493,988</u>
Reconciliation of cash and investments reported on the Statement of Net Position to cash and cash equivalents reported on the Statement of Cash Flows:							
Statement of Net Position cash and cash equivalents and investments	\$ 74,856,505	\$ 0	\$ 0	\$ 637,893	\$ 8,377	\$ 0	\$ 75,502,775
Investments included in balances above that are not cash equivalents	<u>(68,261,616)</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>(68,261,616)</u>
Cash and Cash equivalents reported on Statement of Cash Flows	\$ 6,594,889	\$ 0	\$ 0	\$ 637,893	\$ 8,377	\$ 0	\$ 7,241,159
Noncash Capital Financing Activities:							
During 2021, \$149,288 of capital assets were acquired on capital leases.							
During 2021, \$936,000 of capital assets were acquired through capital contributions.							
At December 31, 2021, the Conservancy District purchased \$808,309 in capital assets on account. At December 31, 2020, the Conservancy District purchased \$1,236,966 in capital assets on account.							

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Required Supplementary Information
Schedule of the Conservancy District's Proportionate Share of the Net Pension Liability
Last Eight Years (1)

	2021	2020	2019	2018	2017	2016	2015	2014
Ohio Public Employees' Retirement System (OPERS)								
Conservancy District's Proportion of the Net Pension Liability	0.0538800%	0.0545420%	0.0564740%	0.0560926%	0.0578391%	0.0569800%	0.0513470%	0.0513470%
Conservancy District's Proportionate Share of the Net Pension Liability	\$ 7,978,455	\$ 10,780,596	\$ 15,467,084	\$ 8,799,841	\$ 13,134,266	\$ 9,869,654	\$ 6,193,022	\$ 6,053,142
Conservancy District's Covered Payroll	\$ 7,310,197	\$ 7,382,564	\$ 7,281,401	\$ 7,040,696	\$ 6,398,882	\$ 6,759,620	\$ 6,022,398	\$ 5,379,079
Conservancy District's Proportionate Share of the Net Pension Liability as a Percentage of its Covered Payroll	109.14%	146.03%	212.42%	124.99%	205.26%	146.01%	102.83%	112.53%
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	86.88%	82.17%	74.70%	84.66%	77.25%	81.08%	86.45%	86.36%

(1) Although this schedule is intended to reflect information for ten years, information prior to 2014 is not available.

Note: The amounts presented for each fiscal year were determined as of the measurement date, which is the prior fiscal year.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Required Supplementary Information
Schedule of the Conservancy District's Contributions - Pension
Last Nine Years (1)

	2021	2020	2019	2018	2017	2016	2015	2014	2013
Ohio Public Employees' Retirement System (OPERS)									
Contractually Required Contribution	\$ 1,059,038	\$ 1,062,024	\$ 1,073,949	\$ 1,067,396	\$ 964,697	\$ 811,542	\$ 857,447	\$ 763,117	\$ 736,558
Contributions in Relation to the Contractually Required Contribution	(1,059,038)	(1,062,024)	(1,073,949)	(1,067,396)	(964,697)	(811,542)	(857,447)	(763,117)	(736,558)
Contribution Deficiency (Excess)	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Conservancy District's Covered Payroll	\$ 7,278,365	\$ 7,310,197	\$ 7,382,564	\$ 7,281,401	\$ 7,040,696	\$ 6,398,882	\$ 6,759,620	\$ 6,022,398	\$ 5,379,079
Contributions as a Percentage of Covered Payroll	14.55%	14.53%	14.55%	14.66%	13.70%	12.68%	12.68%	12.67%	13.69%

(1) Information prior to 2013 is not available.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Required Supplementary Information
Schedule of the Conservancy District's Proportionate Share of the Net OPEB Liability/(Asset)
Last Five Years (1)

	<u>2021</u>	<u>2020</u>	<u>2019</u>	<u>2018</u>	<u>2017</u>
Ohio Public Employees' Retirement System (OPERS)					
Conservancy District's Proportion of the Net OPEB Liability/(Asset)	0.0535870%	0.0538120%	0.0560330%	0.0555267%	0.0572980%
Conservancy District's Proportionate Share of the Net OPEB Liability/(Asset)	\$ (954,695)	\$ 7,432,835	\$ 7,305,380	\$ 6,029,787	\$ 5,787,293
Conservancy District's Covered Payroll	\$ 7,310,197	\$ 7,382,564	\$ 7,281,401	\$ 7,040,696	\$ 6,398,882
Conservancy District's Proportionate Share of the Net OPEB Liability/(Asset)					
as a Percentage of its Covered Payroll	-13.06%	100.68%	100.33%	85.64%	90.44%
Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability/(Asset)	115.57%	47.80%	46.33%	54.14%	54.04%

(1) Although this schedule is intended to reflect information for ten years, information prior to 2017 is not available.

Note: The amounts presented for each fiscal year were determined as of the measurement date, which is the prior fiscal year.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Required Supplementary Information
Schedule of the Conservancy District's Contributions - OPEB
Last Six Years (1)

	2021	2020	2019	2018	2017	2016
Ohio Public Employees' Retirement System (OPERS)						
Contractually Required Contribution	\$ 0	\$ 0	\$ 0	\$ 0	\$ 70,407	\$ 131,851
Contributions in Relation to the Contractually Required Contribution	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>(70,407)</u>	<u>(131,851)</u>
Contribution Deficiency (Excess)	<u>\$ 0</u>	<u>\$ 0</u>				
Conservancy District's Covered Payroll (2)	\$ 7,278,365	\$ 7,310,197	\$ 7,382,564	\$ 7,281,401	\$ 7,040,696	\$ 6,398,882
Contributions as a Percentage of Covered Payroll	0.00%	0.00%	0.00%	0.00%	1.00%	2.06%

(1) Beginning in 2016, OPERS used one trust fund as the funding vehicle for all health care plans; therefore, information prior to 2016 is not presented.

(2) The OPEB plan includes the members from the traditional plan, the combined plan and the member directed plan.

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Notes to the Required Supplementary Information
For the Year Ended December 31, 2021

NOTE 1 - NET PENSION LIABILITY

Changes in Assumptions – OPERS

For fiscal year 2021, the OPERS Board lowered the investment rate of return from 7.2 percent to 6.9 percent along with certain other changes to assumptions for the actuarial valuation as of December 31, 2021.

For fiscal year 2019, the single discount rate changed from 7.50 percent to 7.20 percent.

Amounts reported in calendar year 2017 reflect an adjustment of the rates of withdrawal, disability, retirement and mortality to more closely reflect actual experience. The expectation of retired life mortality was based on RP-2014 Healthy Annuitant mortality table and RP-2014 Disabled mortality table. The following reductions were also made to the actuarial assumptions:

- Discount rate from 8.00 percent to 7.50 percent
- Wage inflation rate from 3.75 percent to 3.25 percent
- Price inflation from 3.00 percent to 2.50 percent

Changes in Benefit Terms – OPERS

In October 2019, the OPERS Board adopted a change in COLA for post-January 7, 2013 retirees, changing it from three percent simple through 2018 then 2.15 percent simple to 1.4 percent simple through 2020 then 2.15 percent simple.

NOTE 2 - NET OPEB LIABILITY

Changes in Assumptions - OPERS

For calendar year 2021, the following changes were made to the actuarial assumptions:

- Discount rate from 3.16 percent to 6.00 percent
- Municipal bond rate from 2.75 percent to 2.00 percent
- Health Care Cost Trend Rate from 10.50 percent to 8.50 percent

For calendar year 2020, the following changes were made to the actuarial assumptions:

- Discount rate from 3.96 percent to 3.16 percent
- Municipal bond rate from 3.71 percent to 2.75 percent
- Health Care Cost Trend Rate from 10.00 percent to 10.50 percent

For calendar year 2019, the following changes were made to the actuarial assumptions:

- Discount rate from 3.85 percent to 3.96 percent
- Investment rate of return from 6.50 percent to 6.00 percent
- Municipal bond rate from 3.31 percent to 3.71 percent
- Health Care Cost Trend Rate from 7.50 percent to 10.00 percent

Muskingum Watershed Conservancy District
Tuscarawas County, Ohio
Notes to the Required Supplementary Information
For the Year Ended December 31, 2021

For calendar year 2018, the single discount rate changed from 4.23 percent to 3.85 percent.

Changes in Benefit Terms – OPERS

No significant changes in benefit terms.

Independent Auditor's Report on Internal Control Over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance With *Government Auditing Standards*

Muskingum Watershed Conservancy District
Tuscarawas County
1319 3rd Street NW
New Philadelphia, OH 44663

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in Government Auditing Standards issued by the Comptroller General of the United States, the financial statements of the Muskingum Watershed Conservancy District (the Conservancy District), Tuscarawas County, Ohio as of and for the year ended December 31, 2021 and the related notes to the financial statements, which collectively comprise the Conservancy District's basic financial statements, and have issued our report thereon dated April 22, 2022.

Report on Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered the Conservancy District's internal control over financial reporting (internal control) as a basis for designing audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Conservancy District's internal control. Accordingly, we do not express an opinion on the effectiveness of the Conservancy District's internal control.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected, on a timely basis. A significant deficiency is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses or significant deficiencies may exist that were not identified.

Report on Compliance and Other Matters

As part of obtaining reasonable assurance about whether the Conservancy District's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the financial statements. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under Government Auditing Standards.

Purpose of This Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with Government Auditing Standards in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

Rea & Associates, Inc.

Rea & Associates, Inc.
New Philadelphia, Ohio
April 22, 2022

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OHIO AUDITOR OF STATE KEITH FABER



MUSKINGUM WATERSHED CONSERVANCY DISTRICT

TUSCARAWAS COUNTY

AUDITOR OF STATE OF OHIO CERTIFICATION

This is a true and correct copy of the report, which is required to be filed pursuant to Section 117.26, Revised Code, and which is filed in the Office of the Ohio Auditor of State in Columbus, Ohio.



Certified for Release 5/19/2022

88 East Broad Street, Columbus, Ohio 43215
Phone: 614-466-4514 or 800-282-0370

This report is a matter of public record and is available online at
www.ohioauditor.gov

Title Opinion Date: January 3, 2023
Title Certification Date: November 16, 2022

Encino Acquisition Partners, LLC
5847 San Felipe, Suite 300
Houston, TX 77057

This Opinion has been rendered
for the exclusive use of Encino
Energy

Attention: Tricia Clark and Tim Struble

Re: Irwin HAR CR Unit
Tax Parcel No. 150000935000
0.055000 acres
Section 20, Township 15, Range 6
Township of Harrison
Carroll County, Ohio

DRILLING TITLE OPINION

SUBJECT LANDS: Tax Parcel No. 150000935000, containing 0.055000 acres,¹ more or less, located in Harrison Township, Carroll County, Ohio, being the same lands more particularly described as “Lot #P-3” of Yogi Bear’s Jellystone Park Camp-Resort, as recorded in the Plat Records of Carroll County, by that certain Amended Plat, dated and recorded July 8, 1974, in File #1, Pocket #2, and Folder #1, by that certain Quitclaim Deed from Carl A. & Barbara Campbell, to The State of Ohio, dated October 20, 1995, recorded October 23, 1995 in Book 269 at Page 69, of the Deed Records of Carroll County, Ohio.

Ladies and Gentlemen:

At your request, this Drilling Title Opinion is based upon the materials described in Exhibit “B” attached hereto (“Materials Examined”). We find title to the lands under examination herein to be vested as set out below subject to the objections and requirements stated herein for the period of time from June 2, 1835 to November 16, 2022 at 11:00 AM (“Closing Date”), the last instrument examined being that Harrison Hills Association, Inc. By-Laws dated May 21, 2022, recorded June 23, 2022 in Book 154 at Page 74. Such ownership credits should not be considered separate and apart from the remaining portions of this Opinion.

¹ Acreage based on GIS calculations and the Plat Map of Yogi Bear’s Jellystone Park Camp-Resort, recorded in the Plat Records of Carroll County, recorded July 8, 1974, in File #1, Pocket #2, and Folder #1.

SCHEDULES OF OWNERSHIP

FEE TITLE

Tax Parcel No. 150000935000

SURFACE ESTATE:

OWNER	INTEREST
State of Ohio	1.00000000
TOTAL	1.00000000

COAL ESTATE:

Pursuant to your instructions, reporting on coal ownership has been omitted from this Opinion.

OIL AND GAS ESTATE:

ROYALTY INTEREST

OWNER	DECIMAL INTEREST	NET ACRES	ROYALTY	NRI	LEASE	OBJECTION
State of Ohio	1.00000000	0.055000	Unleased	1.00000000	Unleased	All
TOTAL	1.00000000	0.055000		1.00000000		

OVERRIDING ROYALTY INTEREST

None – there are no overriding royalty interests.

WORKING INTEREST

OWNER	DECIMAL INTEREST	NET ACRES	LEASE NRI	NRI	LEASE	ORRI NO.	OBJECTION
State of Ohio	1.00000000	0.055000	Unleased	1.00000000	Unleased	N/A	All
TOTAL	1.00000000	0.055000		1.00000000			

BASIC LEASES AND ASSIGNMENTS OF INTEREST IN LEASES

See Exhibit "A" attached hereto.

JOINT OPERATING AGREEMENT ("JOA")

None submitted for examination.

DECLARATION OF POOLED UNIT ("DPU")

None submitted for examination.

ENCUMBRANCES

TAXES:

The Abstract provided contains information from the Carroll County Auditor which indicates that real estate taxes on the Subject Lands are paid in full. **You should obtain instruments reflecting the current status of tax payments due for the Subject Lands and ensure that taxes are timely paid.**

UNRELEASED MORTGAGES ("MOR"):

None reflected in the Abstract examined.

UNRELEASED OIL AND GAS LEASES ("URL"):

1. Dated: September 18, 1967
Filed: November 22, 1967
Recorded: Book 41 at Page 264
Lessor: Edgar B. Kennedy and Ethel E. Kennedy, husband and wife
Lessee: Southern Production Co. Inc.
Lands Described: Bounded lands located in Section 20, Township 15, Range 6, Harrison Township, County of Carroll, Texas, containing 101.45 acres, more or less.

Primary Term: 3 years
Gas Storage: Gas Storage NOT Permitted.
Current Owner: Sanford E. McCormick
Note: We note that this URL describes the leased land by reference to bordering tracts, the location of which we cannot conclusively determine through reliance on the Materials Examined alone. However, there is an affidavit of non-production, dated November 15, 1973, and recorded at Volume 47, Page 881.

UNRELEASED COAL LEASES ("URCL"):

Not examined.

EASEMENTS ("ROW"):

1. Dated: June 7, 1974
Filed: July 8, 1974
Recorded: File #1 Pocket #2 Folder #2
Grantor: Land Unlimited, Inc.
Grantee: Public
Lands Described: Yogi Bear's Jellystone Park Camp-Resort, Map 1, located in Sections 15 and 20, Township 15, Range 6.
Type: Plat.
Note: Provides the plat map for the lots, roads, and other amenities residing within a portion of Yogi Bear's Jellystone Park Camp-Resort.

Contains easements and rights-of-way for the plat owner which are later amended by Harrison Hills Association, Inc.

2. Dated: April 20, 1986
Filed: May 15, 1986
Recorded: Book 220 at Page 660
Grantor: Harrison Hills Association, Inc.
Grantee: Carroll Electric Cooperative, Inc.
Lands Described: Lands of the undersigned, situated in the County of Carroll, State of Ohio, being 101.45 acres, situated in the East part of the Northeast quarter of Section 20, Township 15, Harrison, and Range 6, approximately 5 miles from the town of Carrollton.

Type: Electric line easement and right-of-way.
Note: Subject to several mortgages made to the United States of America, acting through the Administrator of the Rural Electrification Administration and the National Rural Utilities Cooperative Finance Corporation. There is no evidence that Carroll Electric has defaulted on any of these mortgages.

3. Dated: June 15, 1986
Filed: June 30, 1986
Recorded: Book 221 at Page 52
Grantor: Harrison Hills Association, Inc.
Grantee: Carroll Electric Cooperative, Inc.
Lands Described: Lands of the undersigned, situated in the County of Carroll, State of Ohio, being 101.45 acres, situated in the East part of the Northeast quarter of Section 20, Township 15, Harrison, and Range 6, approximately 5 miles from the town of Carrollton, described by bounds.

Type: Electric line easement and right-of-way.
Note: Subject to several mortgages made to the United States of America, acting through the Administrator of the Rural Electrification Administration and the National Rural Utilities Cooperative Finance Corporation. There is no evidence that Carroll Electric has defaulted on any of these mortgages.

We note that this ROW describes the encumbered land by reference to bordering tracts, the location of which we cannot conclusively determine through reliance on the Materials Examined alone.

COVENANTS (“COV”):

1. Dated: February 23, 2022
Filed: April 21, 2022
Recorded: Book 152 at Page 4562
Grantor: Harrison Hills Association, Inc.
Grantee: Public
Lands Described: All lots located on property acquired by Harrison Hills Association, Inc., formerly Harrison Township Property Owners Association, Inc., from Land Unlimited, Inc., by purchase on January 30, 1978, at Sheriff’s sale following foreclosure by the Court of Common Pleas of Carroll County, Ohio, by Deed Book 192, in Pages 919-937.

Type: Restrictive covenants and reservations
Note: The restrictive covenants and reservations herein shall amend, replace, and revise those prior reservations to reflect the change in ownership to the Association.

The relevant restrictive covenants and reservations are as

follows:

All lots in Harrison Hills, except those designated otherwise, shall be used exclusively for single family temporary camping purposes, subject to the rules and regulations promulgated by the Association.

The Association shall have the right of first refusal regarding any sale, assignment or conveyance of any lot by a lot owner.

The Association reserves an easement on all road rights-of-way five (5) feet in width along the side and rear lot lines, as well as rights of ingress and egress, for purposes of maintaining, operating, replacing, repairing, or constructing utility lines.

All covenants and conditions described herein shall continue until January 1, 2048.

PENDING SUITS, JUDGMENTS AND LIENS:

The Abstract examined provides that there are no pending suits, judgments and liens burdening the Subject Lands.

CURRENT AGRICULTURAL USE VALUATION (CAUV) APPLICATION:

The Carroll County Auditor's records reflect no CAUV value.

COMMENTS

1. The above-described land or tracts of land are sometimes called the "Subject Lands."
2. Unless otherwise stated, all references to half sections or quarter sections, and halves or quarters thereof, are references to portions of Section 20, Township 15, Range 6, situated in the Township of Harrison, Carroll County, Ohio.
3. Unless stated otherwise, all references to Volume/Book, Page, and Instrument Numbers, are references to the Deed Records, Mortgage Records, Real Property Records, Oil and Gas Lease Records, or other official records, as appropriate in the Records of the County Recorder and Clerk of Courts of Carroll County, Ohio.
4. The Abstract referenced in Exhibit "B" is, itself, subject to stated limitations, which are incorporated herein by reference.
5. A map depicting the approximate location of the Subject Lands is attached to this Opinion as Exhibit "C".
6. The Abstract examined certifies as to coverage beginning on June 2, 1835 ("Start Date"). Consequently, this Opinion does not certify as to any aspect of title prior to the Start Date, and we have assumed there are no instruments prior to the Start Date which have not been provided for our review and would alter our conclusions herein.

OBJECTIONS AND REQUIREMENTS

OBJECTION 1: OWNER OF THE SUBJECT LANDS ON TAX CARD

Through Quitclaim Deed recorded October 23, 1995 in Book 269, Page 69, The State of Ohio became vested with title to the Subject Lands. However, the Carroll County Auditor lists the owner of the Subject Lands as Harrison Hills Association, Inc. The transfer history on the tax card lists a Quitclaim Deed dated October 23, 1995 as the vesting instrument for Harrison Hills Association, Inc. However, as noted above, the October 23, 1995 Quitclaim Deed vested the State of Ohio with title to the Subject Lands. We assume that the listing of Harrison Hills Association, Inc. as the owner of the Subject Lands is a scrivener's error, and we have reflected ownership of the Subject Lands in the State of Ohio based upon record title.

REQUIREMENT 1:

You should ensure that we have been provided with all instruments out of the State of Ohio and into Harrison Hills Association, Inc. and submit any additional instruments pertaining to the Subject Lands for our review and possible revisions to this Opinion. Furthermore, you should contact the Carroll County Auditor to update the tax records to reflect the State of Ohio with ownership of Tax Parcel No. 150000935000.

OBJECTION 2: PRIOR UNRELEASED OIL AND GAS LEASES

The Materials Examined contain prior unreleased Oil and Gas Leases covering the Subject Lands, as reflected in the Unreleased Oil and Gas Leases section above.

REQUIREMENT 2:

You should obtain Releases of the above referenced Oil & Gas Leases, file same of record (if necessary) and submit same for our examination.

OBJECTION 3: UNLEASED OIL AND GAS INTERESTS

The State of Ohio is vested with an undivided 8/8th oil and gas interest in the Subject Lands, which is unleased.

REQUIREMENT 3:

To the extent you desire to acquire the interest above, you should obtain, file for record, and submit for our examination an oil, gas and mineral lease from the State of Ohio, covering mineral interests in the Subject Lands. You should ensure that your acquisition of an oil and gas lease is in compliance with all applicable statutes and regulations.

OBJECTION 4: MARITAL STATUS OF GRANTOR OMITTED – SUBJECT LANDS

The Materials Examined contain that certain Quitclaim Deed recorded October 23, 1995 in Book 269, Page 69, between Carl A. & Barbara Campbell and the State of Ohio. Said Quitclaim Deed does not contain a recital of marital status of the grantors, necessitating the following requirement.

REQUIREMENT 4:

To the extent you desire to acquire an interest in the Subject Lands, you should obtain, file for record, and submit the same for our examination, a Correction Instrument for the above listed Quitclaim Deed that recites the marital status of each individual grantor, and contains an execution and release of dower from their spouses, if necessary.

OBJECTION 5: PUBLIC ROADS

The Materials Examined do not reveal the existence of any public roads bordering or traversing the Subject Lands.

REQUIREMENT 5:

You should satisfy yourself by surface inspection that there are no public roads bordering or traversing the Subject Lands. If such roads are found to exist, you should contact the undersigned for further comment and requirement.

OBJECTION 6: COVENANT AFFECTING LAND USE OF THE SUBJECT LANDS

COV1 provides amended restrictions and reservations that apply to all lots residing in the Harrison Hills Association Campground, formerly Yogi Bear's Jellystone Park Camp-Resort. Specifically, we draw your attention to the following land use restriction:

“All lots in Harrison Hills, except those designated on the plats thereof for other purposes, shall be used exclusively for single family temporary camping purposes, subject to the rules and regulations promulgated by the Association.”

Some Ohio courts have held that such language effectively prohibits any drilling operations on the land or any inclusion of the land in a pooled unit, and that nearby landowners from a common chain of title may be able to sue to enforce this prohibition and enjoin such drilling or unitization.²

For purposes of this Opinion, we have assumed that the above covenant only prohibits surface operations for oil and gas and was not intended to apply to the drilling of subsurface horizontal well bores.

REQUIREMENT 6:

If you are not willing to adopt our assumption, you should obtain a release of said covenant to the extent it affects your operations. Additionally, you should locate all lands burdened by the covenant referred to above and satisfy yourself that your proposed development of the Subject Lands does not conflict with those rights.

OBJECTION 7: EASEMENT, COVENANT AND RIGHT-OF-WAY AGREEMENTS

The Materials Examined contain Easement, Covenant and Right-of-Way Agreements and other surface encumbrances covering the Subject Lands, as reflected in the Easements section above.

REQUIREMENT 7:

You should locate all lands burdened by Easement, Covenant and Right-of-Way Agreements reflected above, and satisfy yourself that your proposed development of the Subject Lands does not conflict with those rights.

² See *Devendorf vs. Akbar Petroleum Corp.*, 62 Ohio App.3d 842 (Summit County, Ninth District Court of Appeals, 1989). In that case, several landowners held lots of land derived from “a forty-acre unplatted residential tract which was originally conveyed as a single parcel in a 1949 deed.” Said deed and subsequent deeds of some lots provided both that the lands conveyed would be used “solely for private residence and agricultural purposes” and that “no commercial or industrial business shall be conducted thereon” or similar language, while subsequent deeds of some lots contained a similar residential restriction without separately mentioning commercial or industrial activity. The court repeatedly defined oil and gas operations as “commercial” activity, and also held that a “residential use” restriction alone would suffice to prohibit including a parcel in a pooled unit, regardless of whether drilling was physically located on the parcel in question. As to who can sue to enforce a restrictive covenant, the court held, “A present owner of a lot subject to a restriction has the right to enforce the same or similar restrictions imposed upon the other lots by a common grantor . . . ”.

LIMITATIONS

Pursuant to your instructions, in instances where the Materials Examined do not contain Patent(s) from which the Subject Lands originate, we have assumed that the Subject Lands have been properly conveyed from the sovereign. Furthermore, we have necessarily assumed there are no instruments prior to the beginning certification date of the Title Runsheet which would alter our conclusions herein.

Prior to reliance on this Opinion, you should perform a supplemental records check from the closing certification date of the Title Runsheet to ensure that the ownership of the Subject Lands has not changed. The Ownership tables above are limited to ownership of the surface estate, mineral estate, royalty estate, leasehold estate, and (if applicable) the coal estate. Such ownership credits should not be considered separate and apart from the remaining portions of this Opinion.

This Opinion does not cover, nor do we certify to, matters not of record during the period of examination, including unpaid lienable bills for improvements, rights to file mechanics' liens, unpaid tax liens, special taxes and assessments not shown by the county treasurer's records, unrecorded conveyances, vacancies, conflict in boundaries, encroachments or discrepancies in area, the ownership of navigable waterways or any other matter which a survey on the ground might disclose, or the rights of parties, if any, in actual possession of the Subject Lands claiming the same adversely to the record owners thereof or to their predecessors in title. Additionally, pursuant to your instructions, we have omitted any objection related to discrepancies in surveys or acreage as well as objections regarding the use and possession of the Subject Lands.

In addition, this Opinion does not cover any matters relating to compliance with or violation of any federal, state or local laws or regulations, including, without limitation, environmental laws, or any matters relating to compliance with or violation of any orders, decrees, judgments, injunctions, notices or demands issued, entered, promulgated, or approved under any such laws or regulation, zoning and other governmental regulations, including any local township or municipal ordinances or other rules or regulations, liens asserted by the United States and the State of Ohio, their agencies and officers under the Ohio Solid and Hazardous Waste and Disposal Act [R.C. §§ 3734.21 and 3734.22] and Federal Super Fund Amendments, and under Racketeering Influence and Corrupt Organization acts and receivership liens, unless the lien is filed in the public records of the County in which the property is located. Further, this Opinion does not cover the rules and regulations of governmental agencies (including the Internal Revenue Service) and compliance with same and the matters pending before such agencies, nor the effect of bankruptcy proceedings involving any party in the chain of title.

This Opinion is subject to the disabilities of the parties executing instruments and instruments which have been improperly indexed by the County Recorder and Clerk of Courts of Carroll County, Ohio. You are advised to satisfy yourself as to all of the foregoing matters to the extent you deem them to be material.

Recording references in this Opinion to Volume and Page Numbers correspond to the appropriate Official Public Records of Carroll County, Ohio except as otherwise noted, and this Opinion assumes that all recitals and statements of facts in any instrument are true and correct.

This Opinion is intended for the exclusive use of the addressee, and may not be relied upon by any other party without the prior written approval of this firm.

Sincerely,

A handwritten signature in black ink that reads "Scott White". The signature is written in a cursive style with a large, prominent "S" and "W".

Scott White

EXHIBIT "A"

OIL AND GAS LEASES ("L"):

None reflected in the Abstract Examined.

COAL LEASES ("CL"):

Not examined.

EXHIBIT "B"

The Materials Examined in preparation of this Drilling Title Opinion are described as follows:

LEASE FILES

None.

PRIOR OPINIONS

None.

ABSTRACTS

Abstract covering the Subject Lands for the period of time from June 2, 1835 to November 16, 2022, as prepared by Adam Schons of Kastner Land Services, LLC.

INSTRUMENTS EXAMINED

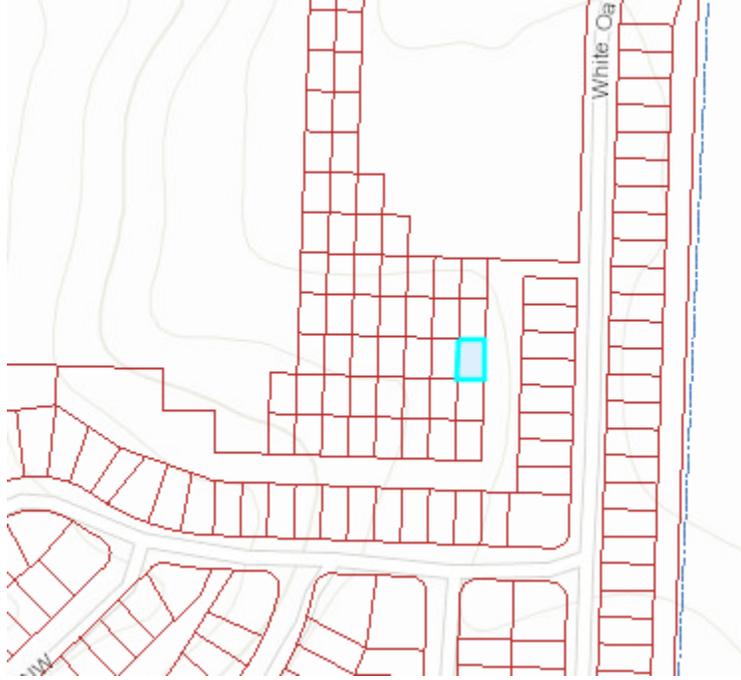
None.

DISPOSITION OF THIS OPINION

A PDF of this Drilling Title Opinion has been forwarded to you via email.

EXHIBIT "C"

The Subject Lands: Tax Parcel No. 150000935000





BID PROPOSAL #: 23-DNR-0001

Pursuant to R.C. 155.33 and the Ohio Oil and Gas Land Management Commission Bid Procedures dated 9.18.2023, please accept this bid proposal for the parcel(s) described more fully below, owned or controlled by an agency of the State of Ohio, and has been nominated and approved for leasing for the exploration, development, and production of oil or natural gas.

DESCRIPTION OF BID PROPOSAL FORMATION AND PARCEL(S):

Company ID: #ON2021063020943

Company Contact:

EAP Ohio, LLC
(a subsidiary of Encino Acquisition Partners, LLC)
5847 San Felipe St., Suite 400
Houston, TX 77057
Attn: Tanner Quiring
tquiring@encinoenergy.com
346.240.3232

Parcel # And Location: 15-0000935.000 being more or less 0.055 gross acres, located in Section 20-15N-6W of Harrison TWP, Carroll County, Ohio and being a part of Valley Run Wildlife Area

Source Deed/Instrument: Book 269, Page 69 in the Carroll County, Ohio Recorder's Office

Percent Ownership: 100%, Undivided

Acreage: 0.055

Identified Formation: Utica Shale, Point Pleasant Formation

Plat Map: Attached Exhibit A

BID TERMS

Lease Bonus:

\$/Acre Bonus: \$3,500/acre

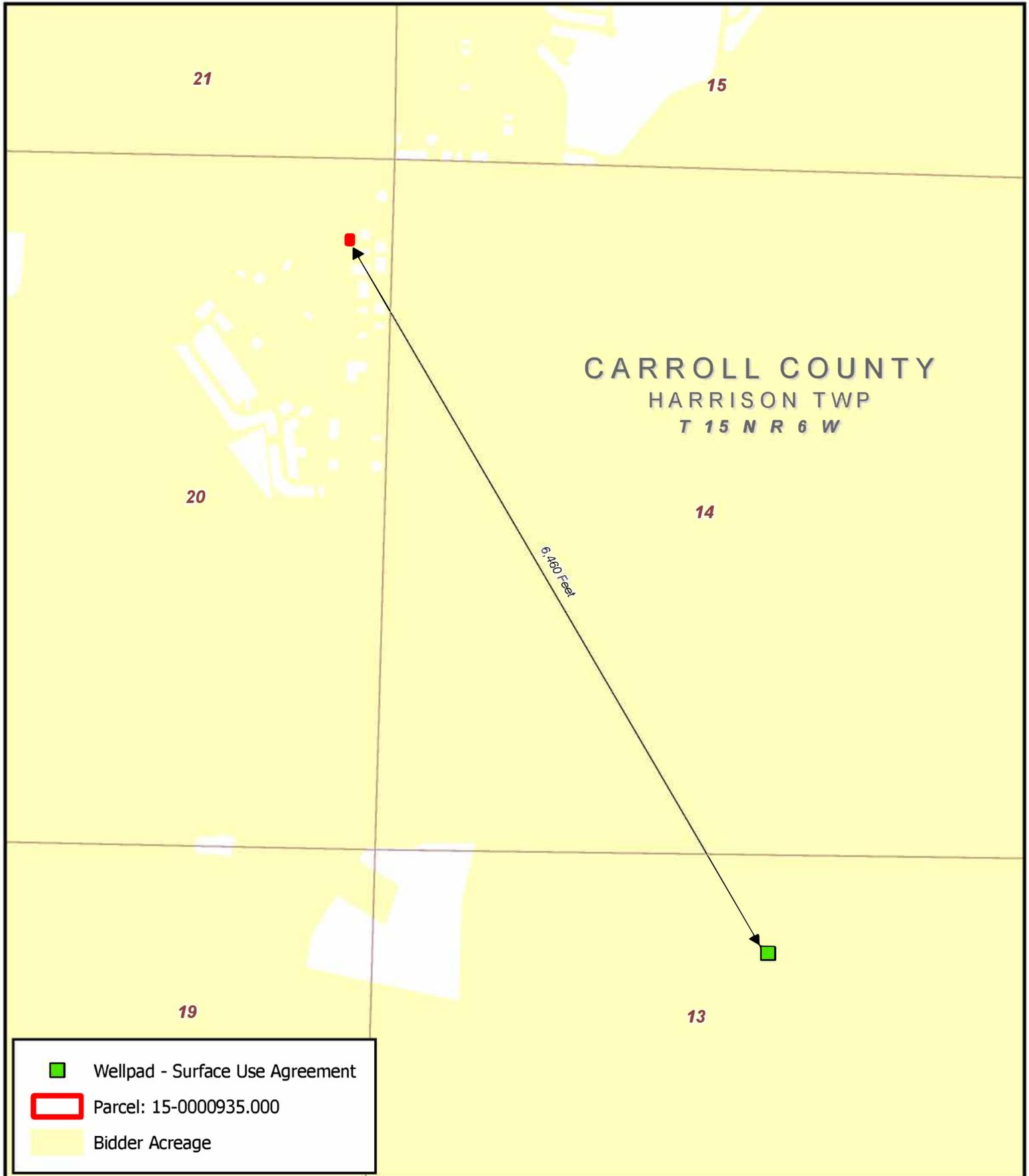
Total Bonus: \$192.50

Royalty Terms:

18% Gross Royalty

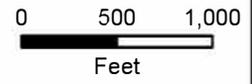
Lease Formation:

[the bottom of the Queenston formation as defined in the Gulfport Energy Corporation's Groh 1-12 Well (API Number 34059242060000) located in Madison Township, Guernsey County, Ohio to the basement rock]



■ Wellpad - Surface Use Agreement
■ Parcel: 15-0000935.000
■ Bidder Acreage

Exhibit A
23-DNR-0001 Location Plat
Harrison Township
Carroll Co., OH
1 inch = 1,000 feet





CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

11/29/2024

1/19/2024

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER LOCKTON COMPANIES 3657 BRIARPARK DRIVE, SUITE 700 HOUSTON TX 77042 866-260-3538	CONTACT NAME: _____	
	PHONE (A/C No. Ext): _____	FAX (A/C No): _____
E-MAIL ADDRESS: _____		
INSURER(S) AFFORDING COVERAGE		NAIC #
INSURER A : Arch Insurance Company		11150
INSURER B : --- SEE ATTACHMENT ---		
INSURER C : Underwriters at Lloyds of London		10736
INSURER D : _____		
INSURER E : _____		
INSURER F : _____		

COVERAGES * CERTIFICATE NUMBER: 15613113 REVISION NUMBER: XXXXXXXX

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PROJECT <input type="checkbox"/> LOC OTHER: _____	N	N	81REG5052000	11/29/2023	11/29/2024	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 100,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 \$
A	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> NON-OWNED AUTOS ONLY	N	N	81CAB5052000	11/29/2023	11/29/2024	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ XXXXXXXX BODILY INJURY (Per accident) \$ XXXXXXXX PROPERTY DAMAGE (Per accident) \$ XXXXXXXX \$ XXXXXXXX
B	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED _____ RETENTION \$ _____	N	N	See Attached	11/29/2023	11/29/2024	EACH OCCURRENCE \$ 100,000,000 AGGREGATE \$ 100,000,000 \$ XXXXXXXX
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N	N/A	81WC15052000	11/29/2023	11/29/2024	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000
C	Energy Package	N	N	B0180ME2419718	1/15/2024	1/15/2025	See Attached

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER**CANCELLATION** See Attachments

15613113
For Information Purposes Only

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Excess Liability Tower

\$10M Umbrella

Carrier: Arch Insurance Company

Policy: 81REU5052000

Term: 11/29/2023 – 11/29/2024

\$15M xs \$10M

Carrier: Talbot Underwriting Ltd / United Specialty Insurance Co

Policy: CRP324807B23 / BTM2311518

Term: 11/29/2023 – 11/29/2024

\$50M xs \$25M

Carrier: Underwriters at Lloyds of London

Policy: JHB-CJP-2579

Term: 11/29/2023 – 11/29/2024

\$25M xs \$75M

Carrier: StarStone Specialty Insurance Company

Policy: W86879230MAR

Term: 11/29/2023 – 11/29/2024

Energy Package

Carrier: Underwriters at Lloyds of London

Policy Number: B0180ME2419718

Effective Dates: 1/15/2024 - 1/15/2025

LIMITS:

SECTION I

Subject to a Combined Single Limit of liability for all coverages provided in Section 1:

\$40,000,000 (100%) Any One Occurrence - Drilling and/or Deepening and/or Workover Wells

\$20,000,000 (100%) Any One Occurrence - All Other Wells

\$60,000,000 (100%) Any One Occurrence – Muti Well Pad Site

\$10,000,000 (100%) Any One Occurrence - Care, Custody and Control.

SECTION II

Oil and Gas Well Lease Onshore Property:

As per Scheduled Values

SECTION III

Onshore Property Damage - Real and Personal Property:

As per Scheduled Values

RETENTIONS / DEDUCTIBLES:

Section 1

\$175,000 (100%) Any One Occurrence - Drilling and/or Deepening and/or Workover Wells

\$125,000 (100%) Any One Occurrence - All Other Wells

\$100,000 (100%) Any One Occurrence - Care, Custody and Control.

Section 2

\$50,000 (100%) any one Occurrence

Section 3

\$50,000 (100%) any one Occurrence

Named Insured Schedule

Encino Acquisition Partners, LLC

EAP Ohio, LLC

EAP Operating, LLC



Ohio Department of Natural Resources

MIKE DeWINE, GOVERNOR

MARY MERTZ, DIRECTOR

Eric Vendel, Chief

Division of Oil and Gas Resources Management
2045 Morse Rd, Building F
Columbus, Ohio 43229
Phone: (614) 265-6922; Fax: (614) 265-6910

January 26, 2024

EAP Ohio LLC
Attn: Kayla McClain
5847 San Felipe St., Suite 400
Houston, TX 77057

RE: Registration with ODNR Division of Oil & Gas Resources Management

To Whom It May Concern:

Please accept this letter as confirmation that EAP Ohio LLC is a registered owner with the Division of Oil & Gas Resources Management (the Division). EAP Ohio LLC was originally registered as a well owner with the Division on 11/13/2018.

When the Division began using an updated web-based Relationally Integrated Computer System (RICS) in mid-2021, we asked both new and established owners to register with the new RICS system. EAP Ohio LLC registered with our new system and that registration was approved on 7/20/2021.

Should you require additional information or assistance, please contact the Surety Section at (614) 265-6922 or Kristina.King@dnr.ohio.gov.

Cordially,

A handwritten signature in dark ink that reads "Kristina R. King".

Kristina King
Business Administrator
Division of Oil & Gas Resources Management
Ohio Department of Natural Resources
Kristina.King@dnr.ohio.gov
614-265-6340

Enclosure: Copies of registration materials



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

Richard J. Simmers, Chief
Division of Oil and Gas Resources Management

2045 Morse Road, Bldg. F-2
Columbus, OH 43229-6693
Phone (614) 265-6922 Fax (614) 265-6910

November 13, 2018

EAP Ohio LLC
5847 San Felipe Street, Suite 300
Houston, TX 77057

Dear Mr. Farrell:

The Division of Oil and Gas Resources Management has reviewed your registration paperwork. The information submitted has been accepted, and you have been assigned Owner Number **10240**.

With all future correspondence and filings with the Division, please include your owner number.

Sincerely,

A handwritten signature in cursive script, appearing to read "Cynthia Marshall".

Cynthia Marshall
Division of Oil and Gas Resources Management

c: Division File



OHIO DEPARTMENT OF NATURAL RESOURCES
 DIVISION OF OIL & GAS RESOURCES MANAGEMENT
 2045 MORSE RD., F-2, COLUMBUS, OH 43229-6693
 Phone: (614) 265-6922 • Fax: (614) 265-6910



RECEIVED
 OCT 25 2018
 DIVISION OF OIL & GAS

AUTHORITY & ORGANIZATION FORM (Form 9)

1. OWNER NUMBER: <u>10240</u>	
2. NAME & MAILING ADDRESS: EAP Ohio, LLC 5847 San Felipe Street, Suite 300 Houston TX 77057-0001 EMAIL: jameson@encinoenergy.com PHONE NUMBER: (281) 254-7070 CELL PHONE NUMBER: (281) 658-9527 FAX NUMBER: (281) 254-7071	5. PURPOSE OF FILING: <input checked="" type="checkbox"/> NEW OWNER <input type="checkbox"/> ADDRESS AND/OR TELEPHONE CHANGE <input type="checkbox"/> CHANGE OF AUTHORIZED AGENT <input type="checkbox"/> CHANGE OF STATUTORY AGENT <input type="checkbox"/> TEMPORARY PLUG ONLY <input type="checkbox"/> NAME CHANGE
3. STREET ADDRESS: 5847 San Felipe Street, Suite 300 Houston TX 77057-0001	6. CURRENT ORGANIZATION: <input type="checkbox"/> CORPORATION <input type="checkbox"/> LIMITED PARTNERSHIP <input checked="" type="checkbox"/> LIMITED LIABILITY CORPORATION <input type="checkbox"/> LIMITED LIABILITY PARTNERSHIP <input type="checkbox"/> PARTNERSHIP <input type="checkbox"/> TRUST <input type="checkbox"/> SOLE PROPRIETORSHIP <input type="checkbox"/> JOINT VENTURE <input type="checkbox"/> OTHER: _____
4. IF ORGANIZATION IS A SUBSIDIARY OR AN ASSUMED NAME (dba), PROVIDE NAME & ADDRESS OF ASSOCIATED COMPANY: Encino Acquisition Partners, LLC 5847 San Felipe Street, Suite 300 Houston TX 77057-0001	
7. EXEMPT DOMESTIC WELL OWNER (see criteria on back of form) NOTE: Exempt domestic well owner only complete boxes 2, 3, 5, and 7. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE PROVIDE NUMBER OF ACRES: _____	
8. IF A REORGANIZATION, PROVIDE NAME AND ADDRESS OF PREVIOUS ORGANIZATION:	
9. LIST NAME AND STREET ADDRESS OF AUTHORIZED AGENT AND ENCLOSE A COPY OF CERTIFICATE OF APPOINTMENT: Jameson Farrell, VP, Drilling & Completions * (Additional authorized agent information included in attached memorandum) 5847 San Felipe Street, Suite 300 Houston, TX 77057-0001 EMAIL: jameson@encinoenergy.com PHONE NUMBER: (281) 254-7070 FAX NUMBER: (281) 254-7071 CELL PHONE NUMBER: (713) 890-2226	
10. LIST NAME AND STREET ADDRESS OF STATUTORY AGENT (Corporations only): NATIONAL REGISTERED AGENTS, INC 4400 EASTON COMMONS WAY, SUITE 125 COLUMBUS, OH 43219 EMAIL: _____ PHONE NUMBER: _____ FAX NUMBER: _____ CELL PHONE NUMBER: _____	

I, the undersigned, being first duly sworn, depose and state under penalties of law, that I am authorized to complete this Authority and Organization Form on behalf of the organization listed above, that this form was prepared by me or under my supervision and direction, and that date and facts stated herein are true, correct, and complete to the best of my knowledge.

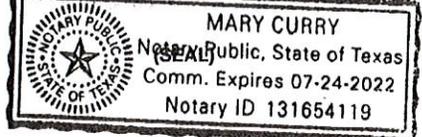
That I hereby agree to conform with all provisions of Chapter 1509, ORC, to all orders and rules issued by the Chief of the Division of Oil and Gas Resources Management.

SIGNATURE OF AUTHORIZED AGENT: Jameson Farrell

TITLE: Vice President, Drilling and Completions

NAME (Typed or Printed): Jameson Farrell

SWORN to and subscribed before me this 16 day of October, 2018



Mary Curry
 (Notary Public)
7/24/2022
 (Date Commission Expires)

NOTE: A certificate issued by an Insurance company stating the owner has in force a combined (general aggregate): \$1 million bodily injury coverage and property damage for well(s) located in non-urban areas, \$3 million bodily injury coverage and property damage for well(s) located in urban areas*, or \$5 million bodily injury and property damage for owners of a horizontal well(s). The certificate MUST BE ATTACHED or on file at the Division of Oil and Gas Resources Management UNLESS YOU QUALIFY AS AN EXEMPT DOMESTIC WELL OWNER.

* Check the 2010 Census information found at oilandgas.ohiodnr.gov/Urban-Drilling-Requirements to determine if your well is located in an urban area.
 DNR 5618 (REV513) PAGE 1 OF 2