

# Developing New Mexico's Oil and Natural Gas Methane Strategy:

## Community Impacts Meeting

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NEW MEXICO ENVIRONMENT DEPARTMENT

NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES  
DEPARTMENT

Spring 2020

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# Developing New Mexico's Methane Strategy

## Meeting Overview –

- 2:00 to 3:30- Slide Presentations with Questions and Answers
  1. Updates and Background on NM Methane Strategy
  2. Culture Impacts and Outreach to Communities
  3. Health Impacts
  4. Economic Impacts
- 3:30 to 3:45- Intermission
- 3:45 to 4:15- Moderated Panel Question and Answers
- 4:15 to 5:00- Public Input
- 5:00 to 6:00- Open House Format

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## Developing New Mexico's Methane Strategy



*"EMNRD and NMED shall jointly develop a statewide, enforceable regulatory framework to secure reductions in oil and gas sector methane emissions and to prevent waste from new and existing sources and enact such rules as soon as practicable."*

- Governor Michelle Lujan Grisham

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## Developing New Mexico's Methane Strategy



**Science:** Using the best available science to inform our decision-making in protecting public health, the environment and minimizing waste.



**Innovation:** Employing creative engineering and technological solutions to address the public health, environmental and waste challenges.



**Collaboration:** Engaging communities and interested stakeholders in our methane strategy decision-making.

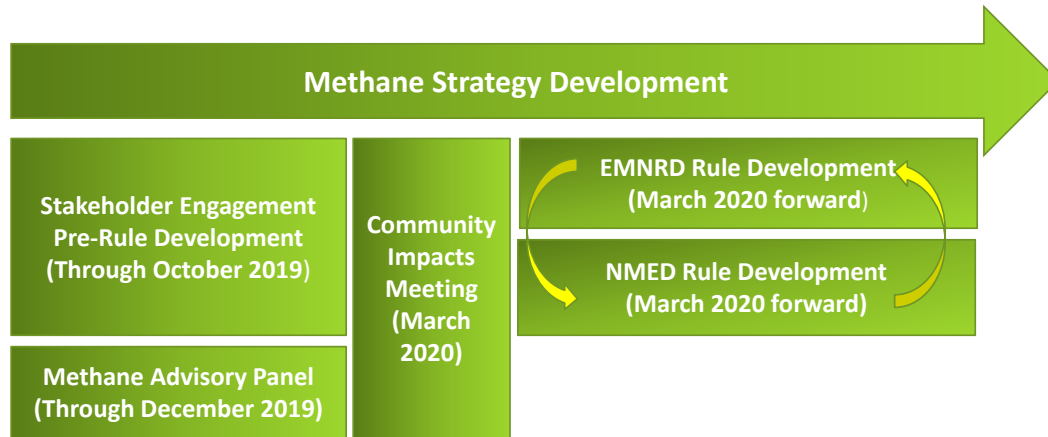


**Compliance:** Ensuring meaningful compliance with state regulations and permits.

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# Developing New Mexico's Methane Strategy

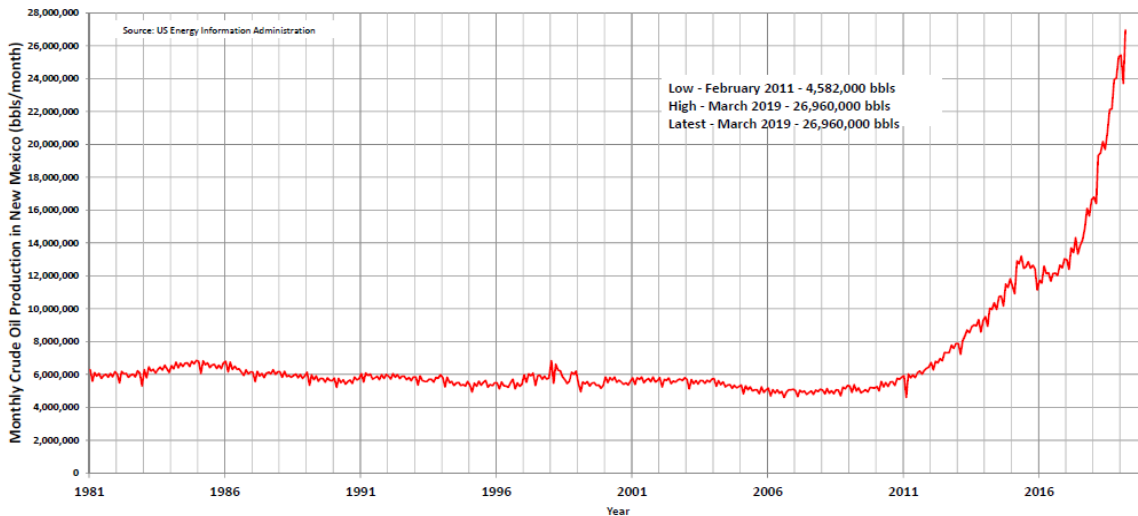


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# Developing New Mexico's Methane Strategy

Monthly Crude Oil Production in New Mexico Since 1981



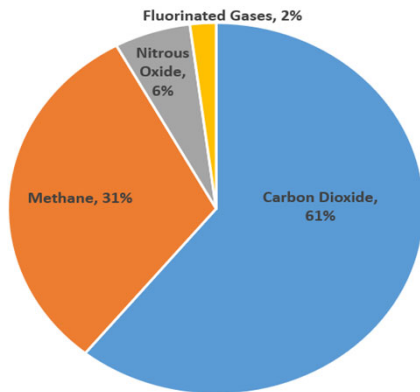
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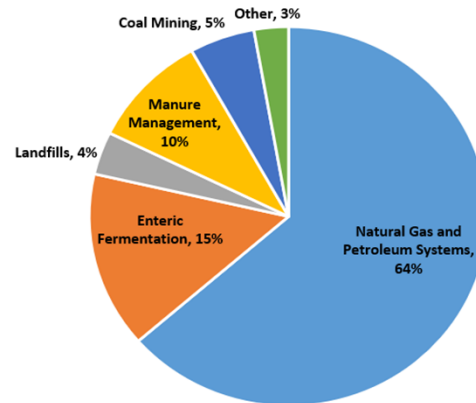
## Developing New Mexico's Methane Strategy

Methane is a **potent greenhouse gas** with a global warming potential 25 times greater than that of carbon dioxide.

New Mexico Greenhouse Gas Emissions



New Mexico Methane Emissions



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## Developing New Mexico's Methane Strategy

In 2018, oil and natural gas companies reported over **36 billion cubic feet of vented or flared natural gas**. This information was collected using the New Mexico Oil Conservation Division's required production reports (known as C115 reports).

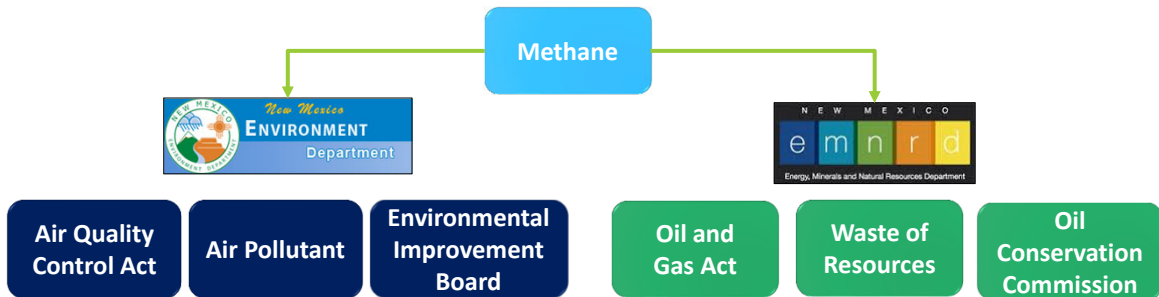
This equated to approximately **\$10 million in lost revenues** to New Mexico in 2018.



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## Developing New Mexico's Methane Strategy



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## Developing New Mexico's Methane Strategy



Methane from the oil and natural gas industry is **packaged with other pollutants**: volatile organic compounds (VOCs), which are a key ingredient in ground-level ozone (smog); and a number of other pollutants known as “air toxics” – in particular, benzene, toluene, ethylbenzene and xylene.



Methane can be a **waste product** from the oil and natural gas industry. This occurs through the venting and flaring of methane at various points across the oil and gas value chain. When a resource is wasted, the state of New Mexico is no longer able to collect royalties on the waste, and the resource is not available for future beneficial use.

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## Developing New Mexico's Methane Strategy

### Waste Reported to EMNRD

Year	Venting	Flaring	Total
2016	3,376,009	21,799,677	25,175,686
2017	2,123,452	14,886,332	17,009,784
2018	3,462,237	32,749,804	36,212,041

\*Values in Mscf

\*\*Values reported in C115 form

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## Developing New Mexico's Methane Strategy

- The Air Quality Control Act requires the State to develop a plan, including the adoption of regulations, to reduce ozone precursors (VOC and NOx) in areas where monitored ozone levels are greater than 95% of the ozone standard.
- NMED is developing rules targeting VOC and NOx reductions in seven counties. **Such reductions in VOC will collaterally reduce methane.**
- Multiple stages of stakeholder and public engagement are planned.
- Outreach to the general public, industry, local and tribal governments will be followed by draft rules.

### Seven Counties:

Bernalillo  
Chavez  
Doña Ana  
Eddy  
Lea  
Rio Arriba  
San Juan



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## Developing New Mexico's Methane Strategy

- NMED is currently gathering or developing information related to ozone formation science in the seven counties; ozone-related health effects; monitoring data and source-specific emission information.
- In adopting regulations, state law requires the EIB to consider:
  1. Public interest, including the social and economic value of the sources of emissions;
  2. Energy, environmental, and economic impacts;
  3. Efforts by sources to reduce emissions prior to the effective date of the rule; and the remaining useful life of existing sources.



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## Developing New Mexico's Methane Strategy

- New Mexico Oil and Gas Act:
  - Written in 1935 and amended to prevent waste, protect correlative rights, and protect public health and the environment (70-2-12 NMSA)
  - The Oil and Gas Act prohibits "waste" from oil and gas production.
- To prevent waste of gas resources, the OCD has a "no vent or flare" rule.
  - Rule 19.15.18.12(A) NMAC, titled "Casinghead Gas" states: An operator shall not flare or vent casinghead gas produced from a well after 60 days following the well's completion



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## Developing New Mexico's Methane Strategy

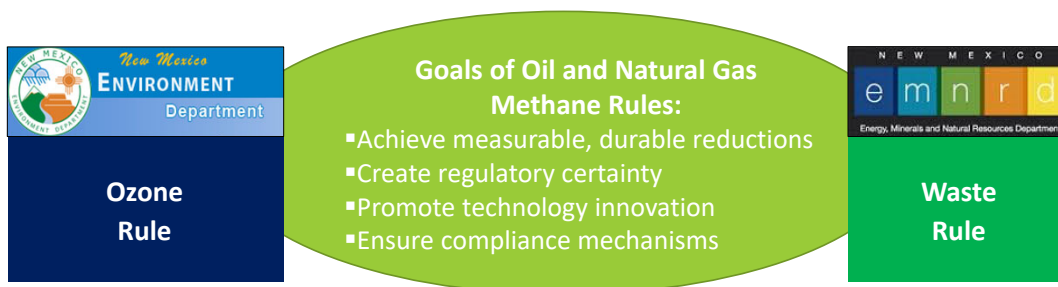
- EMNRD will review the current rules governing the prevention of waste to determine what changes in rules and procedures are necessary.
- EMNRD will seek feedback from stakeholders on various options to address waste issues.
- EMNRD will develop draft rule proposals based on feedback during initial outreach.
- Draft rule changes will be made available for comment as part of the public outreach.



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## Developing New Mexico's Methane Strategy

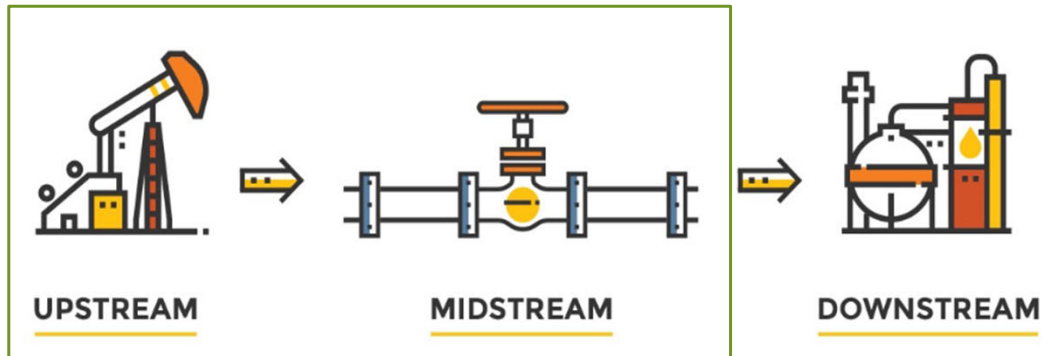


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## Developing New Mexico's Methane Strategy



Source: Energy HQ

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## Developing New Mexico's Methane Strategy

- Methane Advisory Panel (MAP) formed, consisting of technical stakeholders focusing on processes and equipment associated with exploration, production, gathering and processing.
- Members included local and national eNGOs, major and independent upstream/midstream industry.
- Technical guests included academia and technology companies
- Charge to the MAP:
  - Develop emission- and waste-based standards for equipment and operations
  - Propose monitoring, recordkeeping and reporting structures

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## Developing New Mexico's Methane Strategy

- MAP Meeting Structure-
  - Two, four hour meetings every other week
  - Held over a twelve week period (mid August thru November)
  - Facilitated discussion focused on reducing waste and VOC emissions by equipment type and processes
  - Draft topic reports, documents and presentations posted online as developed
- Draft MAP report posted for a 60 comment period ending 2/20/2020

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## Developing New Mexico's Methane Strategy

### Report Topics:

- |                                   |  |
|-----------------------------------|--|
| ■ Completions and Simulations     | ■ Compressors and Engines                    |
| ■ Workovers                       | ■ Workovers Liquids Unloading                |
| ■ Heater Treaters                 | ■ Separators/Heaters/ Storage Vessels        |
| ■ Venting and Flaring             | ■ Completions/Recompletions and Stimulations |
| ■ Infrastructure Planning         | ■ Dehydration Units                          |
| ■ Pneumatic Controllers and Pumps |  |
| ■ Leak Detection                  |  |

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## Developing New Mexico's Methane Strategy

### How to engage in the process:

- **Phase 1 (2019):** Follow the MAP, attend public meetings, and provide input.
- **Phase 2 (2020):** Follow and provide public input during rulemaking development for OCC and EIB: <https://www.env.nm.gov/new-mexico-methane-strategy/>



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## Developing New Mexico's Methane Strategy

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# Acronyms

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AQCA = Air Quality Control Act

CAA = U.S. Clean Air Act

EIB = Environmental Improvement Board

NM EMNRD = New Mexico Energy, Minerals  
and Natural Resources Department

NMED = New Mexico Environment  
Department

OCC = Oil Conservation Commission

OCD= Oil Conservation Division

OGA = Oil and Gas Act

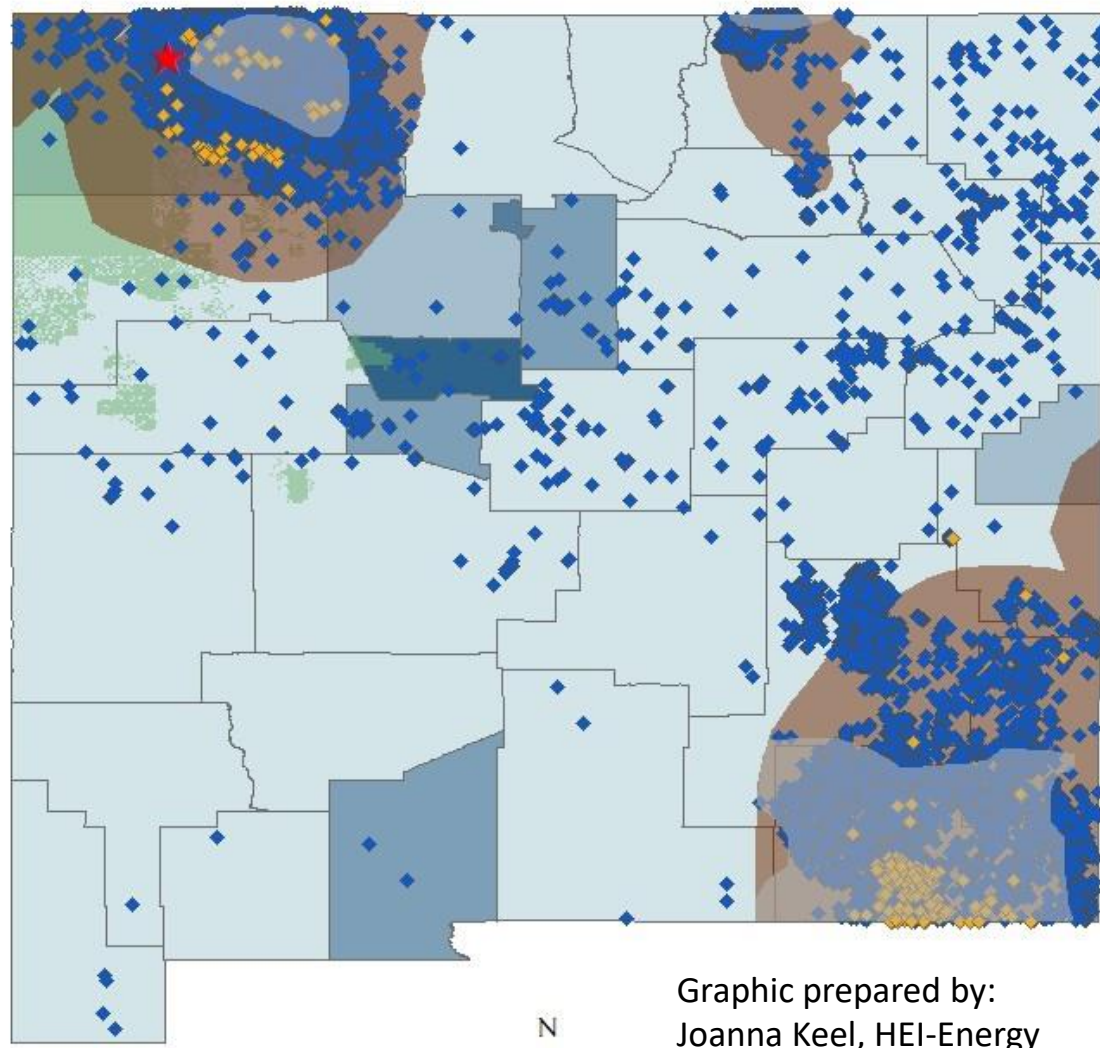
eNGO = environmental non-governmental  
organization

**Community  
Impacts Meeting**  
March 19, 2020

Hosted by:  
New Mexico  
Departments  
of Environment  
(NMED) and Energy,  
Minerals and Natural  
Resources (EMNRD)

*Oil and gas development  
in the United States:*  
**Potential Human  
Exposures and  
Health Effects**

Donna Vorhees, ScD  
Health Effects Institute-Energy  
Boston, MA



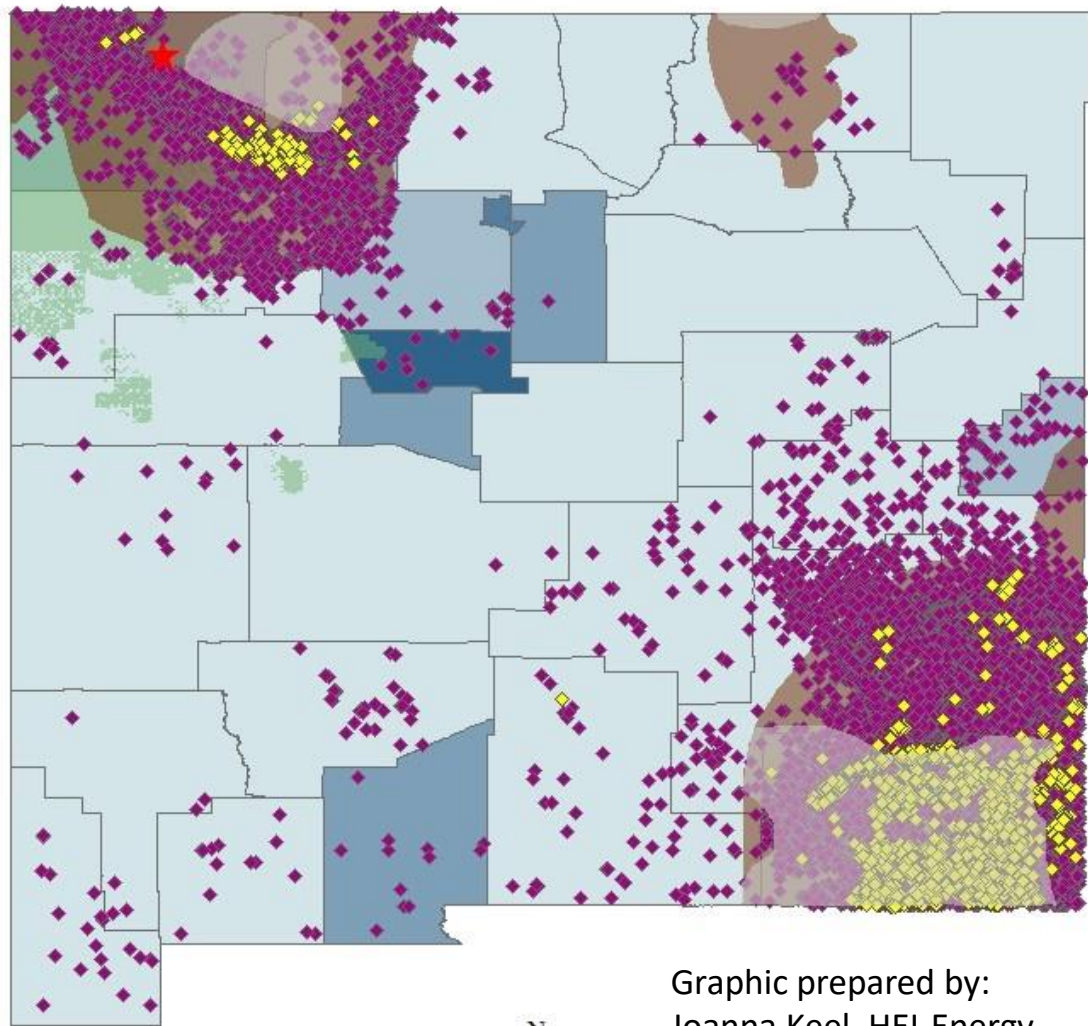
Graphic prepared by:  
Joanna Keel, HEI-Energy

### Legend

- ★ Farmington
- ◆ Gas Wells 1900-2013
- ◆ Gas Wells 2014-2018
- Sedimentary Basins
- Shale Plays
- Tribal Land
- County-Level Population Density (People per Square Mile)
- 0 - 16
- 23 - 38
- 57 - 78
- 168
- 584

# Gas wells and population density in New Mexico





**Legend**

- ★ Farmington
  - ◆ Oil Wells 1900-2013
  - ◆ Oil Wells 2014-2018
  - Sedimentary Basins
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- County-Level Population Density  
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- 0 - 16
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  - 168
  - 584

# Oil wells and population density in New Mexico

Graphic prepared by:  
Joanna Keel, HEI-Energy

0 35 70 140 Miles



# Health Effects Institute-Energy

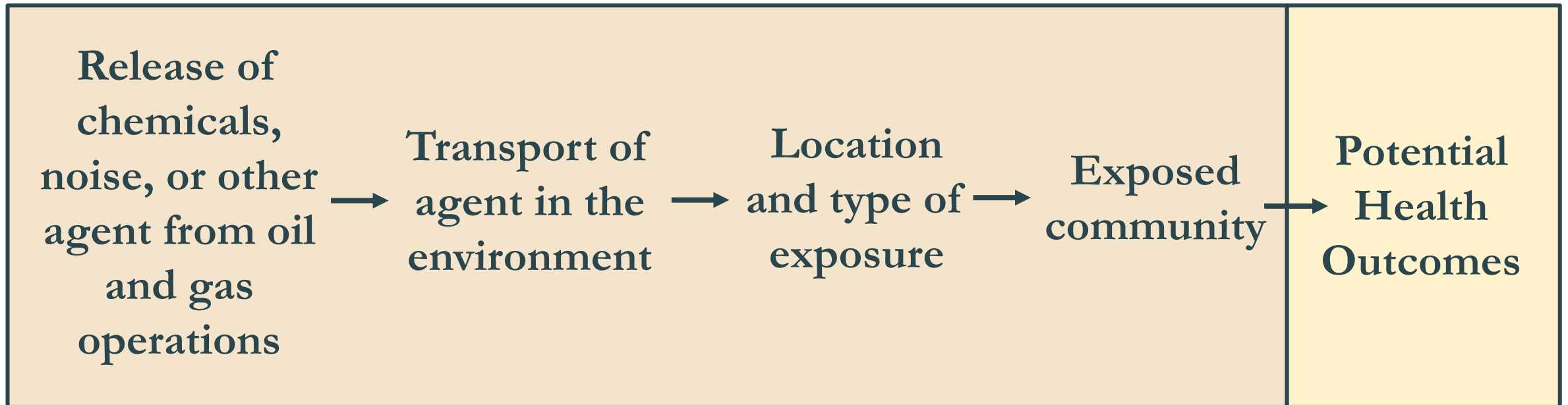
## *A new national research program*

- Research on human exposures associated with onshore development of oil and natural gas from shale and other unconventional resources across the United States
- As feasible and appropriate based on findings from the exposure studies, targeted efforts to assess the potential health effects that might result from exposures

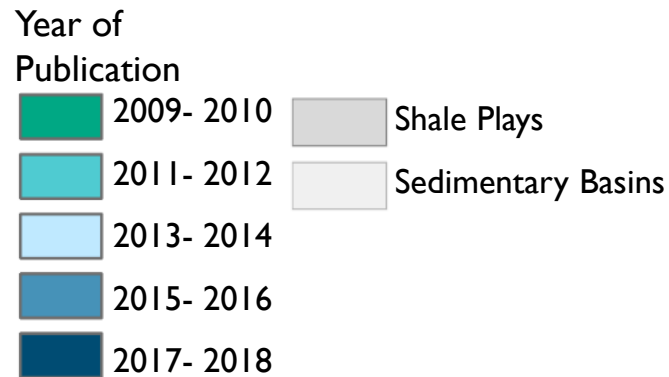
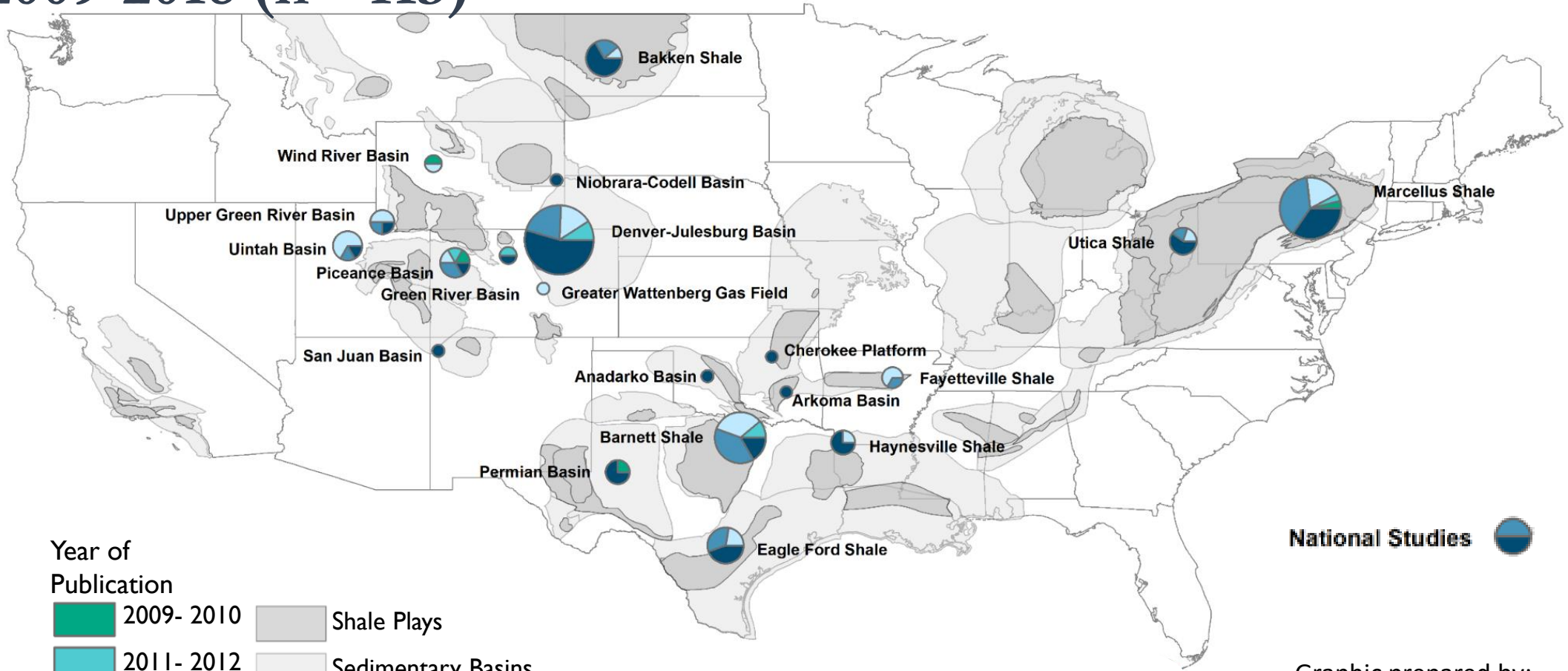
- Independent, nonprofit corporation chartered to provide policy-relevant, high-quality, and impartial science
- Funded jointly by government and the oil and natural gas industry
- Funds research that is selected, conducted, overseen, and reviewed independently of our sponsors



# What we would like to know to assess health risk



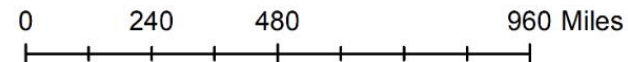
# Air Studies by Location and Year of Publication for 2009-2018 (n= 113)



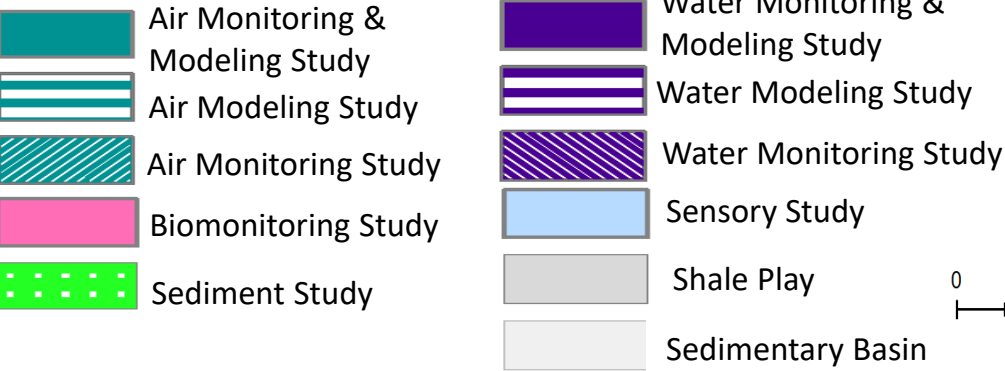
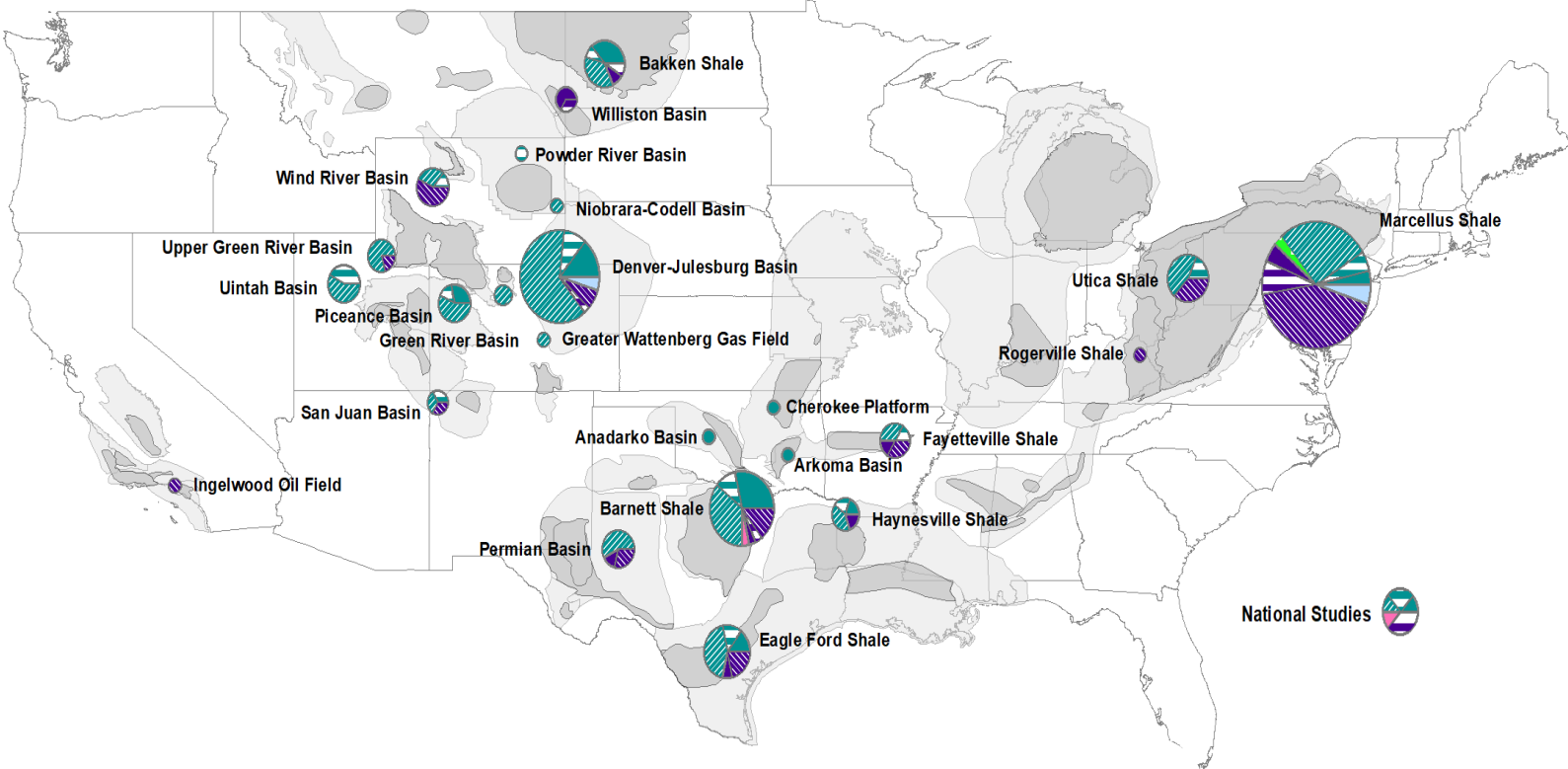
**National Studies**

Graphic prepared by:  
Lee Ann Adelsheim, HEI-Energy

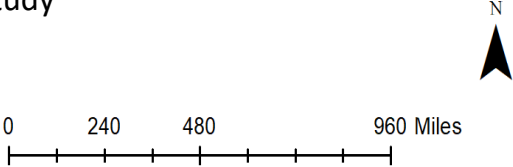
\*Largest chart represents 37 studies. Smallest represents 1 study.



# Studies Monitoring or Modeling Levels of Chemical and Non-Chemical Agents (n=187)



Graphic prepared by:  
Lee Ann Adelsheim, HEI-Energy



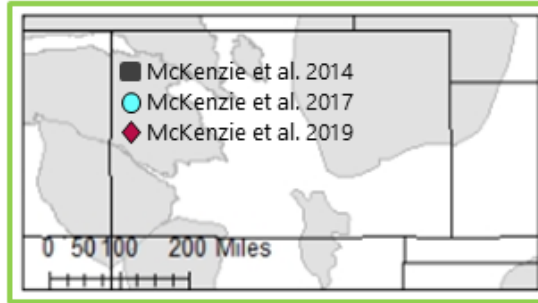
Largest chart represents 80 studies. Smallest represents 1 study



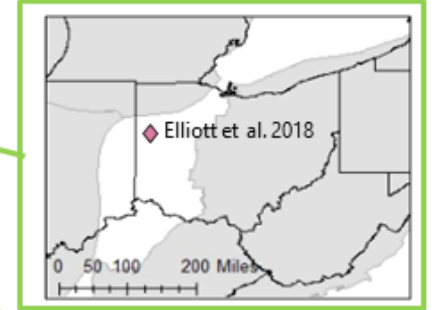
# HEI-Energy 2019 review of epidemiology literature

Studies displayed by location, study design, and assessed outcomes

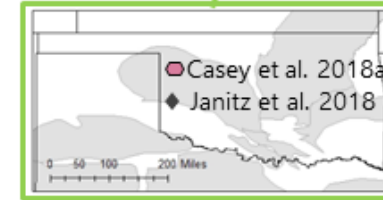
## Colorado



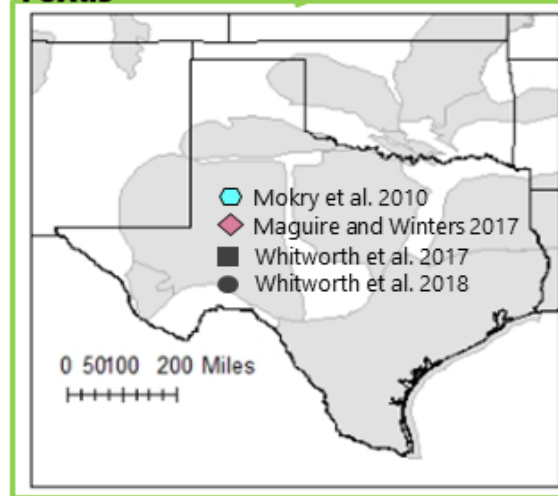
## Ohio



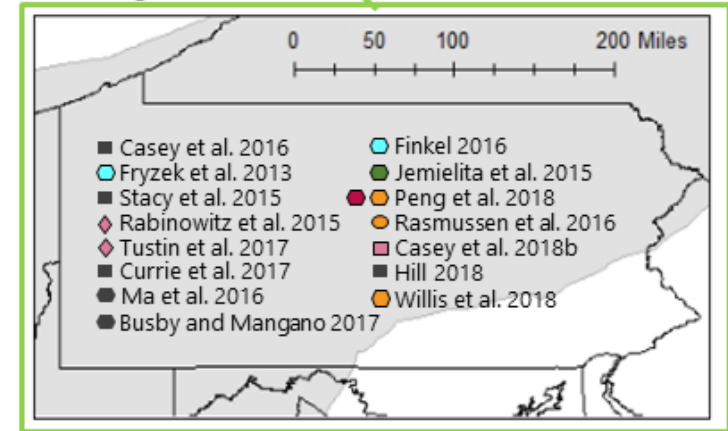
## Oklahoma



## Texas

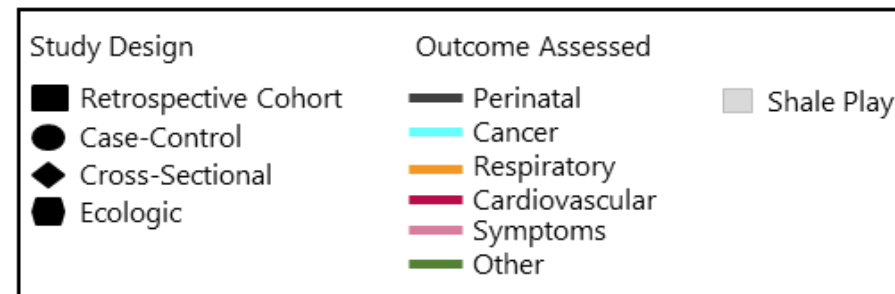


## Pennsylvania



## Studies published since review:

Apergis et al. 2019; Brown et al. 2019; Casey et al. 2019; Denham et al. 2019; McKenzie et al. 2019.



# Concluding Remarks

- Ongoing research about potential exposures and health effects associated with unconventional oil and gas development
- Next steps for the *Health Effects Institute-Energy*: funding community exposure research in multiple regions of the United States



SPECIAL REPORT 1

A Health Effects  
Institute Affiliate

September 2019

POTENTIAL HUMAN  
HEALTH EFFECTS  
ASSOCIATED WITH  
UNCONVENTIONAL OIL  
AND GAS DEVELOPMENT: A  
SYSTEMATIC REVIEW OF THE  
EPIDEMIOLOGY LITERATURE

HEI-Energy Research Committee

Health Effects Institute–Energy  
75 Federal Street, Suite 1400  
Boston, MA 02210, USA  
+1-617-488-2300  
[www.hei-energy.org](http://www.hei-energy.org)

*Reports available at:  
[hei-energy.org](http://hei-energy.org)*



SPECIAL REPORT 2  
*Draft for Public Comment*

A Health Effects  
Institute Affiliate

HUMAN EXPOSURE TO  
UNCONVENTIONAL OIL  
AND GAS DEVELOPMENT: A  
LITERATURE SURVEY FOR  
RESEARCH PLANNING

HEI-Energy Research Committee

Health Effects Institute–Energy  
75 Federal Street, Suite 1400  
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[www.hei-energy.org](http://www.hei-energy.org)

# Thank You

For more information:

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or

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NEW MEXICO  
LEGISLATIVE  
FINANCE  
COMMITTEE

# Overview of Economic and Fiscal Impacts of the Oil and Gas Industry in New Mexico

Presented to the Energy, Minerals, and Natural Resource  
Department's Community Input Meeting  
March 19, 2020

Dawn Iglesias, Chief Economist, LFC

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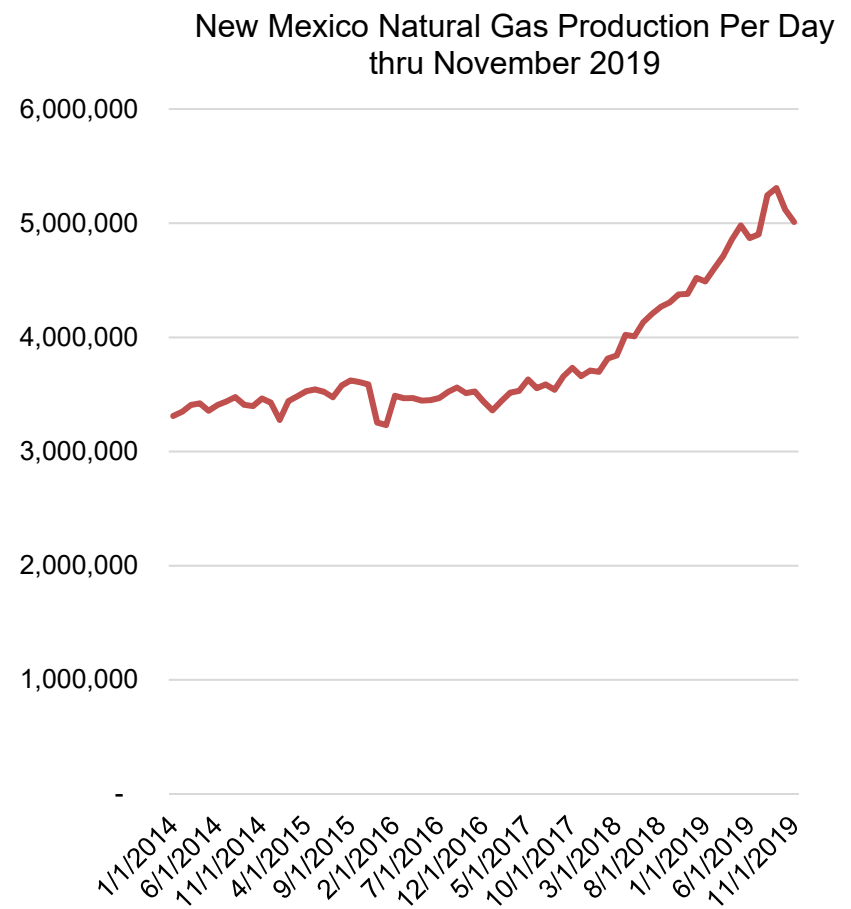
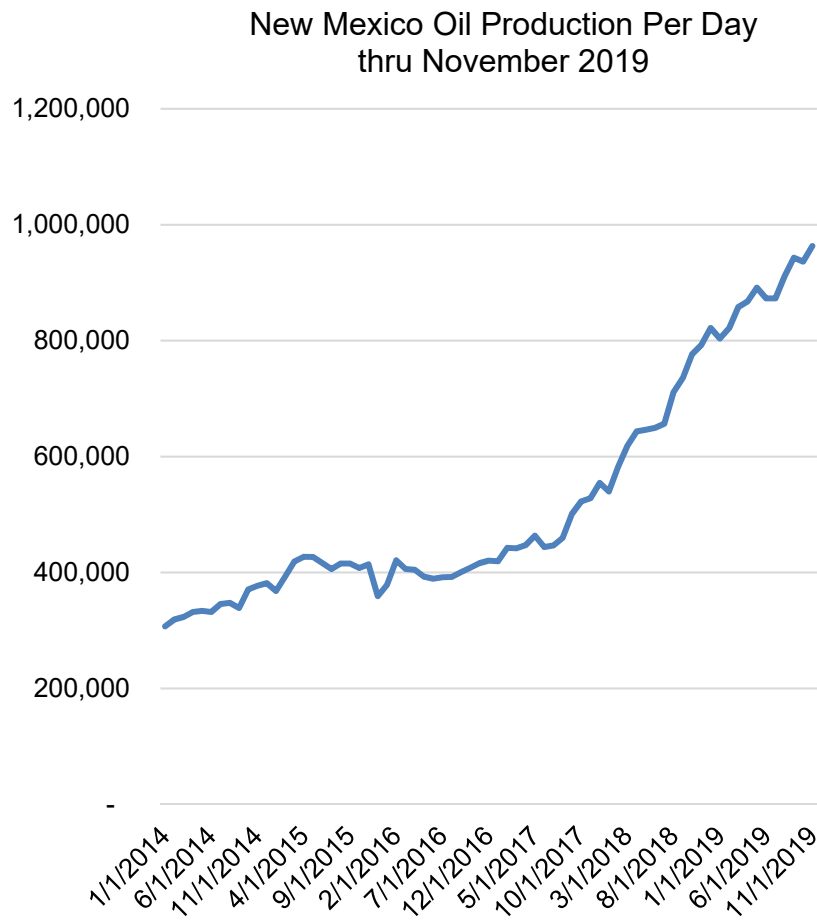
# Summary

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- Oil producing regions enjoy significant economic growth during boom time, boosting state and local investment, employment, and household income.
  - Growth comes with its own challenges – strains on local housing, school, and infrastructure, as well as environmental considerations.
- Energy markets are volatile, adding uncertainty for state and local governments and residents over when, and to what extent, prices and production could fall.
- When prices drop, local and state economies face sharp declines, and decisions or investments made during the boom may become obsolete.
  - Create challenges for planning in both public and private sectors, with substantial risks for residents of oil producing regions

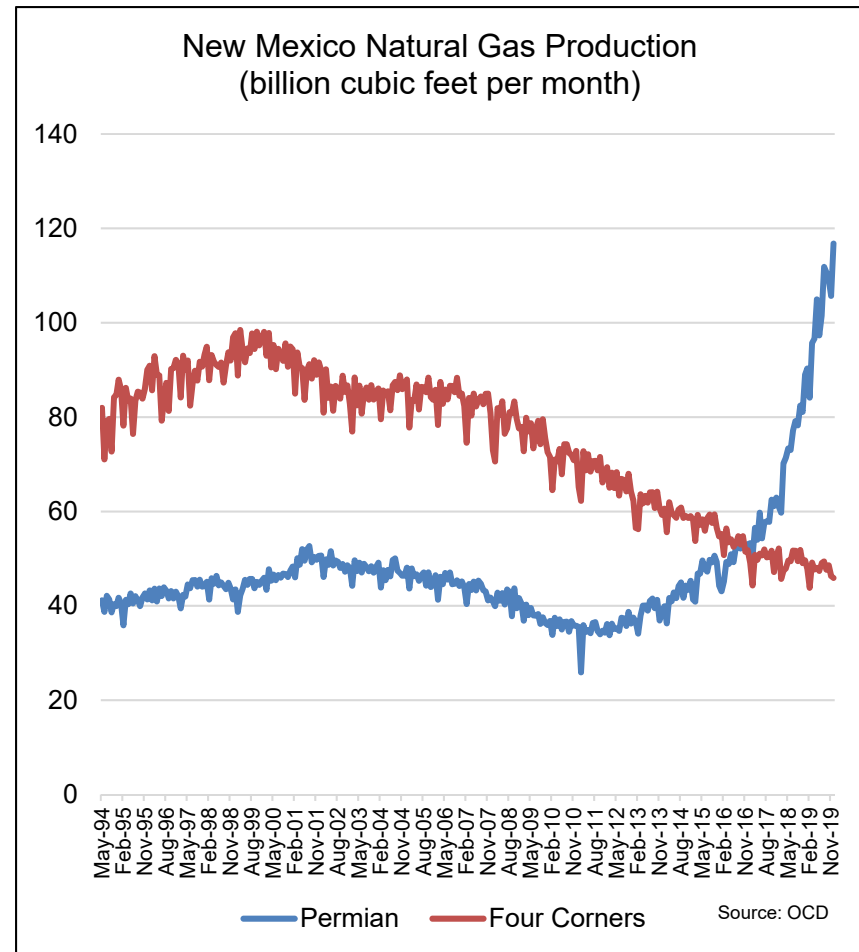
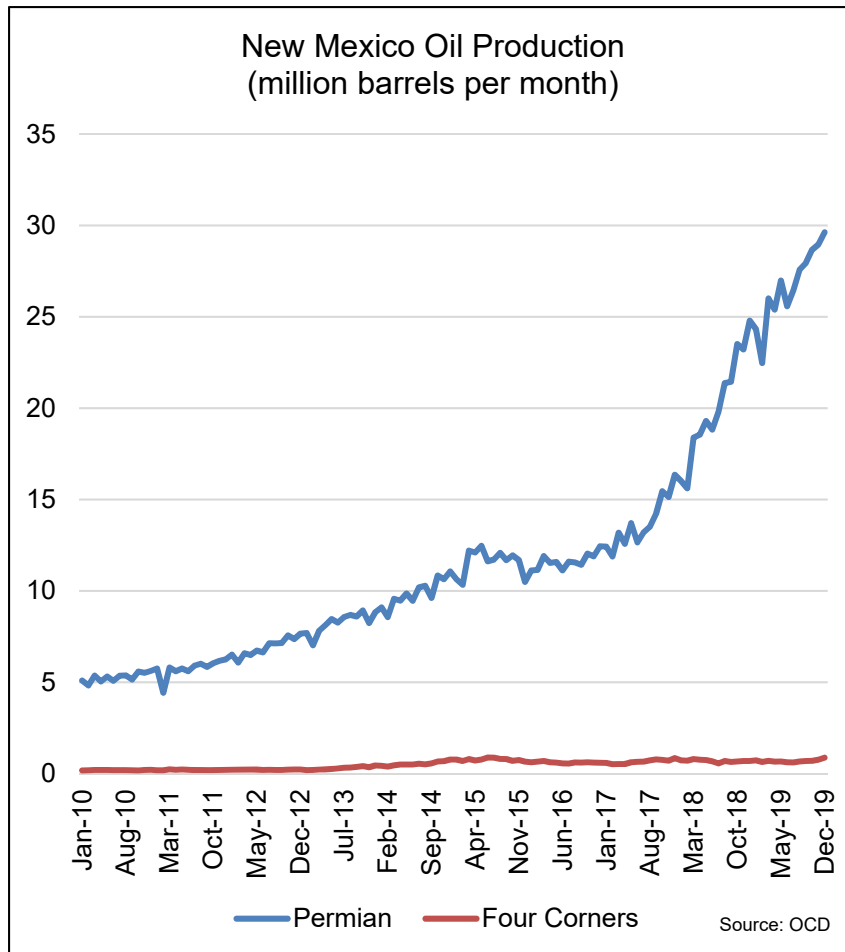


# Unprecedented growth in oil and gas production in New Mexico...



Source: OCD

... with production growing in the Permian basin while San Juan basin continues gradual decline.



## New Mexico Gross State Product by Industry

Rank	Sector	2019Q3 Nominal GSP
1	Government and government enterprises	24,278.3
2	Real estate and rental and leasing	13,799.2
3	Mining, quarrying, and oil and gas extraction	9,779.2
4	Health care and social assistance	7,940.1
5	Professional, scientific, and technical services	7,666.2
6	Retail trade	5,750.5
7	Manufacturing	4,411.9
8	Construction	4,020.5
9	Finance and insurance	3,620.7
10	Accommodation and food services	3,491.8
11	Wholesale trade	3,417.0
12	Administrative and support and waste management and remediation services	2,961.3
13	Transportation and warehousing	2,935.1
14	Information	2,884.5
15	Other services (except government and government enterprises)	2,263.7
16	Utilities	1,806.6
17	Agriculture, forestry, fishing and hunting	1,385.3
18	Arts, entertainment, and recreation	764.9
19	Management of companies and enterprises	593.8
20	Educational services	578.9

Source: Bureau of Economic Analysis

## New Mexico Gross State Product by County

Rank	County	2018 Nominal GSP
1	Bernalillo, NM	37,865,783
2	Doña Ana, NM	7,516,342
3	Lea, NM	7,505,999
4	Eddy, NM	7,354,225
5	Santa Fe, NM	6,685,324
6	San Juan, NM	5,833,607
7	Sandoval, NM	3,226,655
8	Curry, NM	3,173,812
9	Otero, NM	2,858,450
10	McKinley, NM	2,671,053
11	Los Alamos, NM	2,348,290
12	Chaves, NM	2,099,949
13	Valencia, NM	1,439,258
14	Grant, NM	1,204,979
15	Rio Arriba, NM	1,198,329
16	Taos, NM	980,375
17	Luna, NM	846,225

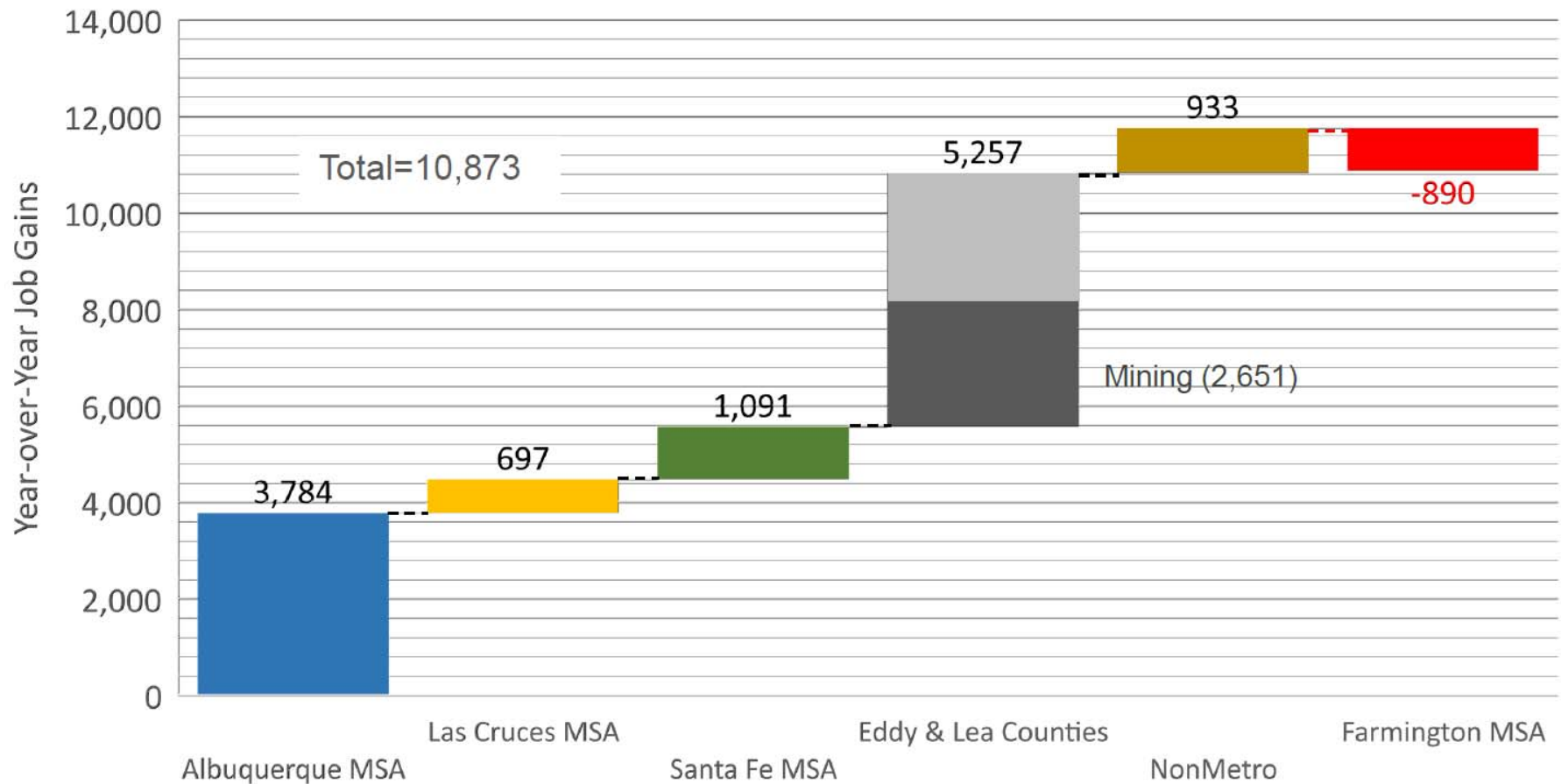
Rank	County	2018 Nominal GSP
18	Cibola, NM	683,956
19	San Miguel, NM	680,396
20	Lincoln, NM	680,055
21	Roosevelt, NM	661,710
22	Socorro, NM	519,956
23	Colfax, NM	442,675
24	Torrance, NM	364,554
25	Quay, NM	312,748
26	Sierra, NM	311,272
27	Hidalgo, NM	206,777
28	Union, NM	184,718
29	Guadalupe, NM	138,801
30	Mora, NM	84,182
31	Catron, NM	84,094
32	Harding, NM	77,483
33	De Baca, NM	54,801

# New Mexico Employment by Sector

Rank	Sector	2019 Employment Estimates (thousands)
1	Healthcare & Social Assistance	120.898
2	Local Government (includes schools)	100.89
3	Retail Trade	92.177
4	Accommodation & Food Services	88.554
5	Professional & Technical Services	58.113
6	Construction	48.043
7	State Government	47.072
8	Administrative & Waste Services	44.068
9	Federal Government	29.16
10	Manufacturing	26.333
11	Mining	23.056
12	Finance & Insurance	22.875
13	Wholesale Trade	21.25
14	Other Services & Unclassified	20.8
15	Transportation & Warehousing	18.782
16	Military Employment	17.013
17	Information	12.902
18	Agriculture, Forestry, Fishing & Hunting	10.57
19	Real Estate, Rental & leasing	10.136
20	Arts, Entertainment & Recreation	10.026
21	Educational Services	9.81
22	Management of Companies & Enterprises	5.265
23	Utilities	4.231

Source: Bureau of Labor Statistics

In 2018, oil and gas activity accounted for 55 percent of new jobs statewide, and oil and gas related employment grew by 21.6 percent.



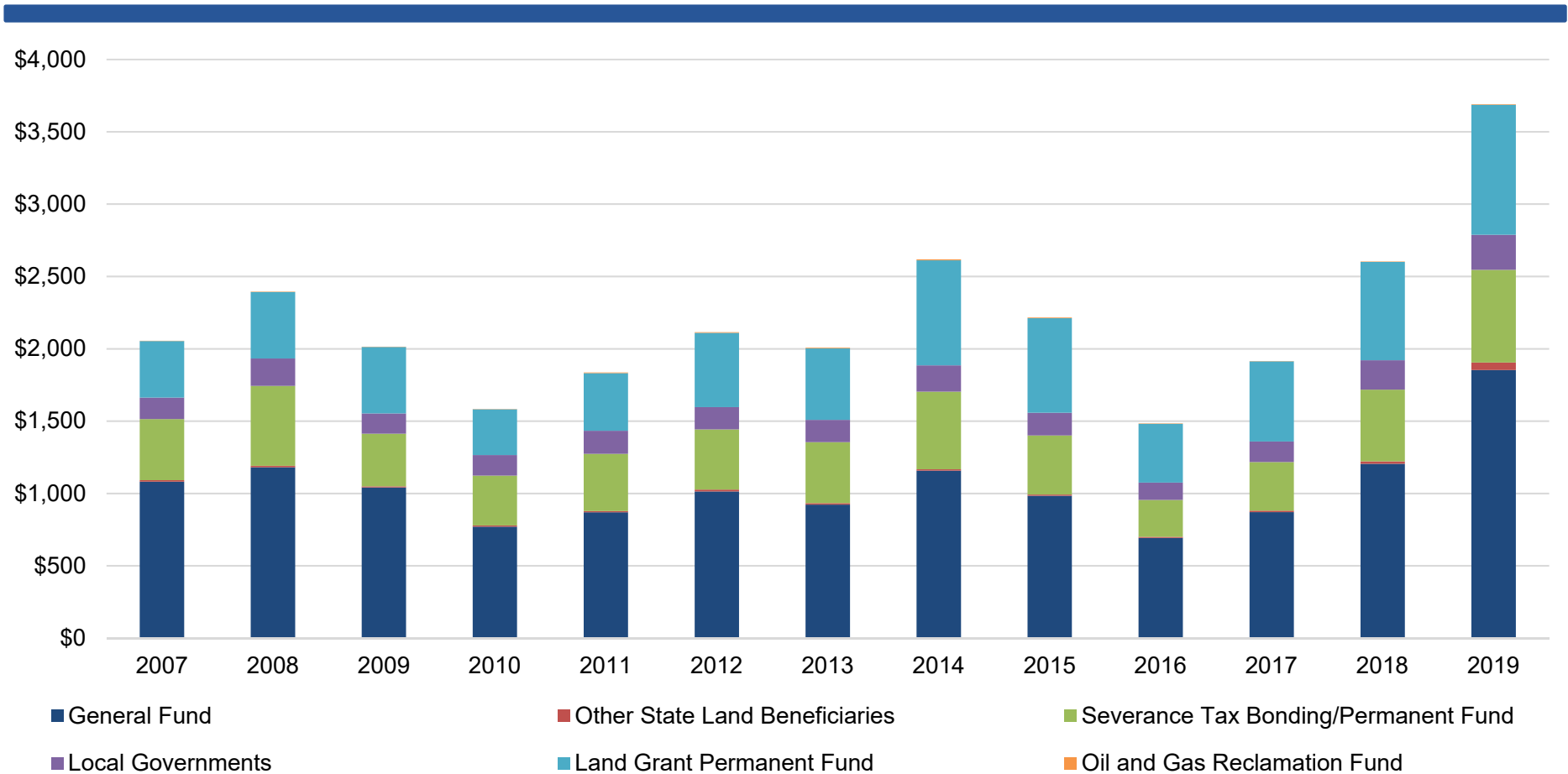
Source: UNM Bureau of Business and Economic Research analysis of BLS data

# New Mexico Oil and Natural Gas Revenues

	Type	Name	Rate	Destination	FY18 Amount
Taxes	Production Tax	Oil & Gas Emergency School Tax	3.15% (oil) 4.0% (gas)	General Fund	\$451 million
		Oil & Gas Conservation Tax	0.19%	General Fund	\$23 million
		Oil and Gas Severance Tax	3.75%	Severance Tax Bonding Fund, Severance Tax Permanent Fund	\$496 million
	Property Tax	Ad Valorem Production Tax	Varies	Local Governments	\$173 million
		Ad Valorem Equipment Tax	Varies	Local Governments	\$29 million
	Processing Tax	Natural Gas Processers Tax	Formula	General Fund	\$11 million
	Sales & Use Taxes	Gross Receipts Tax & Compensating Tax	Varies by Location	General Fund, Local Governments	\$1 billion
Income Taxes	Personal Income Tax & Corporate Income Tax	Varies by Income	General Fund	Unknown	
Land Income	Federal Royalties, Rents, & Bonuses	Federal Royalties	12.5%	General Fund, Federal Government	\$1.1 billion
		Federal Bonuses & Rents	Varies	General Fund, Federal Government	\$164 million
	State Royalties, Rents, & Bonuses	State Oil and Gas Royalties	Varies	Land Grant Permanent Fund, Other Land Beneficiaries	\$679 million
		State Oil and Gas Bonuses and Rents	Varies	General Fund, Other Beneficiaries	\$112 million

Source: LFC Files

# Distribution of New Mexico Oil and Gas Production Revenue: Production Taxes, Property Taxes, and Land Income (in billions)



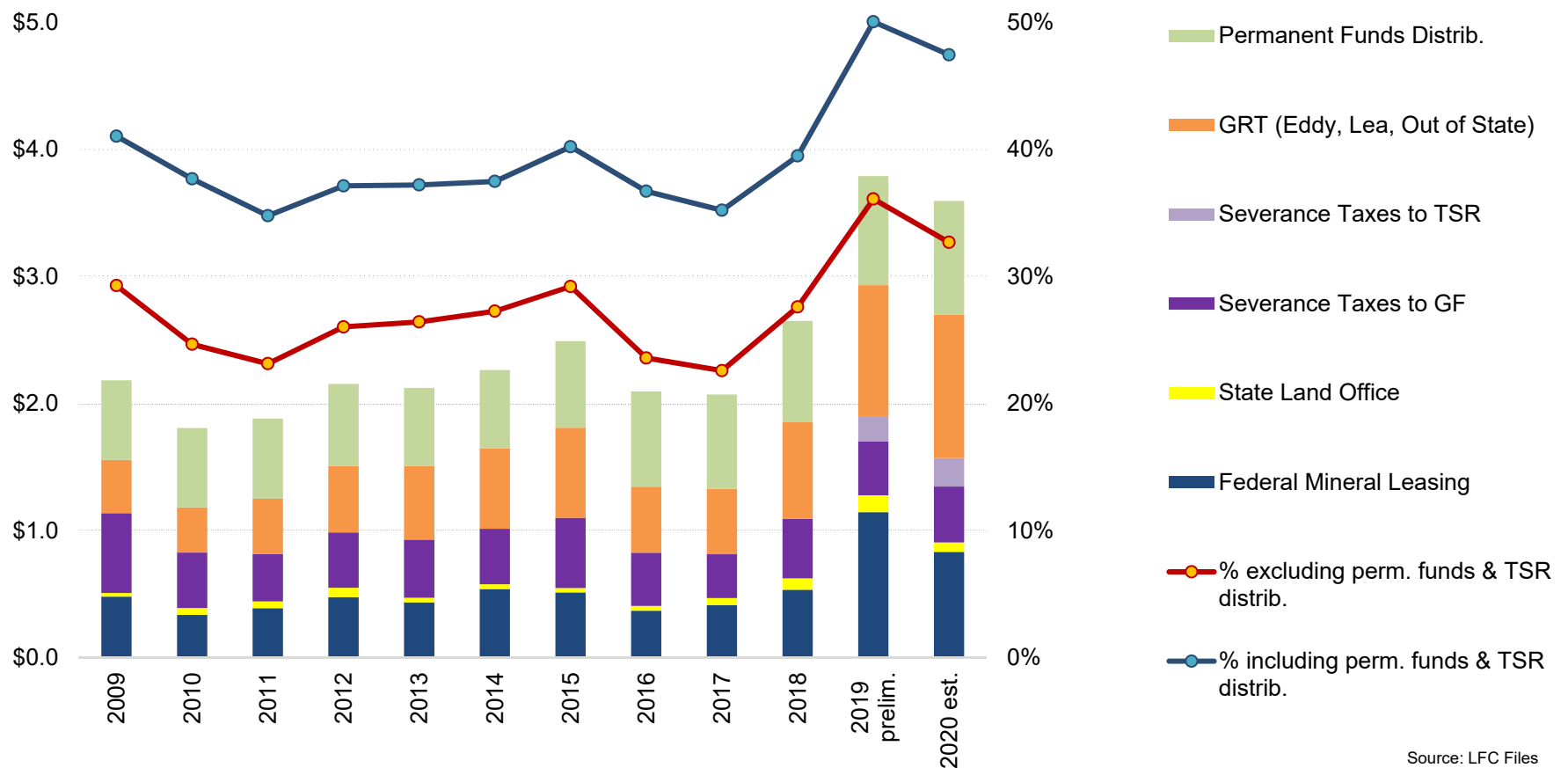
Note: Excludes federal distributions of royalty payments

Source: US Department of Interior, SLO, TRD, LFC Files



# Growing dependence on general fund revenues from the oil and gas industry.

General Fund Revenues Dependent on Oil & Gas Industry (\$ billions)



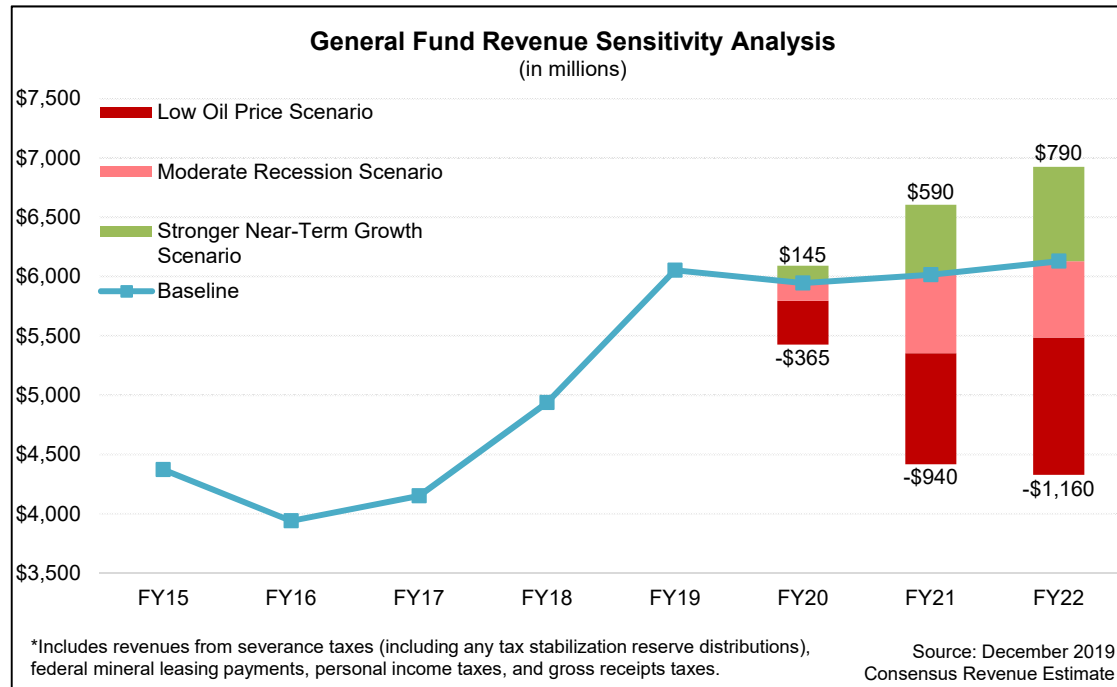
Source: LFC Files

# What do changes in production and prices mean for the state general fund?

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- Reliance on oil and gas related revenues increases general fund volatility and makes revenues forecasts particularly sensitive to changes in commodity prices and production.
- Based on projected FY20 direct oil and gas revenues (production taxes and federal royalties),
  - A \$1 change in the annual average NM price of oil has about a \$22 million impact on the general fund
  - A \$0.10 change in the annual average NM price of natural gas has about a \$17 million impact on the general fund
  - Each additional million barrels of oil generates about \$3 million for the general fund
  - Each additional 10 billion cubic feet of natural gas generates about \$2 million for the general fund

# Stress tests show an energy downturn could impact general fund revenues greater than a moderate recession.



Scenario	FY20			FY21			FY22		
	Low Oil Price	Moderate Recession	Stronger Growth	Low Oil Price	Moderate Recession	Stronger Growth	Low Oil Price	Moderate Recession	Stronger Growth
Severance Taxes	-\$70	-\$5	\$70	-\$220	-\$140	\$275	-\$225	-\$105	\$320
Federal Mineral Leasing	-\$45	-\$5	\$35	-\$190	-\$110	\$205	-\$245	-\$130	\$320
Gross Receipts Taxes	-\$225	-\$100	\$25	-\$480	-\$290	\$55	-\$615	-\$285	\$85
Personal Income Taxes	-\$25	-\$35	\$15	-\$50	-\$125	\$55	-\$75	-\$120	\$65
<b>Total Difference from Baseline</b>	<b>-\$365</b>	<b>-\$145</b>	<b>\$145</b>	<b>-\$940</b>	<b>-\$665</b>	<b>\$590</b>	<b>-\$1,160</b>	<b>-\$640</b>	<b>\$790</b>

Note: in millions

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Questions?