



# RETHINKING PRODUCED WATER: **NM 546**

**Produced Water Act-NM 546**

# Forward Looking Statements and Other Matters

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This presentation (and oral statements made regarding the subjects of this presentation) contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. These are statements, other than statements of historical fact, that give current expectations or forecasts of future events for Marathon Oil Corporation (the “Company”). Words such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “forecast,” “future,” “guidance,” “intend,” “may,” “outlook,” “plan,” “project,” “seek,” “should,” “target,” “will,” “would,” or similar words may be used to identify forward-looking statements; however, the absence of these words does not mean that the statements are not forward-looking.

While the Company believes its assumptions concerning future events are reasonable, a number of factors could cause actual results to differ materially from those projected, including, without limitation: conditions in the oil and gas industry; changes in political or economic conditions in the jurisdictions in which the Company operates; capital available for exploration and development; drilling and operating risks; difficulty in obtaining necessary approvals and permits; non-performance by third parties of contractual obligations; unforeseen hazards such as weather conditions; cyber-attacks; changes in safety, health, environmental, tax and other regulations; other geological, operating and economic considerations; and the risk factors, forward-looking statements and challenges and uncertainties described in the Company’s 2018 Annual Report on Form 10-K, Quarterly Reports on Form 10-Q and other public filings and press releases, available at [www.Marathonoil.com](http://www.Marathonoil.com). Except as required by law, the Company undertakes no obligation to revise or update any forward-looking statements as a result of new information, future events or otherwise.

# Oil and Gas Development in New Mexico

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Resurgence of oil and gas development in New Mexico has **increased opportunities** for oil and gas operators and provided additional revenue to the state while improving energy security for the country.

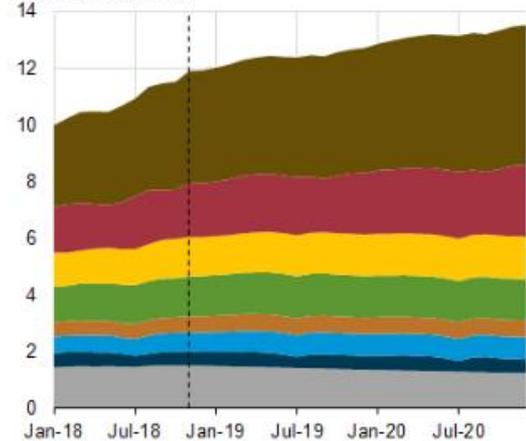
However, **challenges** must be overcome such as procuring available water supplies in an arid region and managing large volumes of waste water generated from production.

# Permian Production Growth and Water Footprint

Growing production will require water resources and further stress regional disposal infrastructure, especially since unconventional plays have limited capability to utilize EOR technology at this time

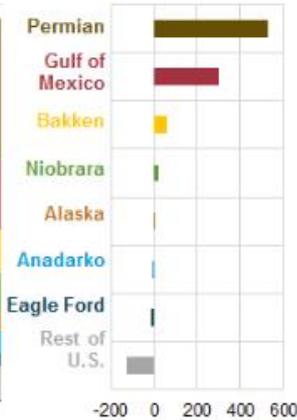
Figure 1. Monthly U.S. crude oil production  
January 2018 - December 2020

million barrels per day



Projected change  
2019 vs 2020

thousand barrels per day



Source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, February 2019

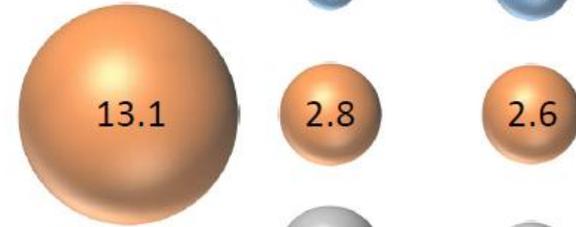


## Permian Basin 2005-2015

HF/Oil >>



PW/Oil >>



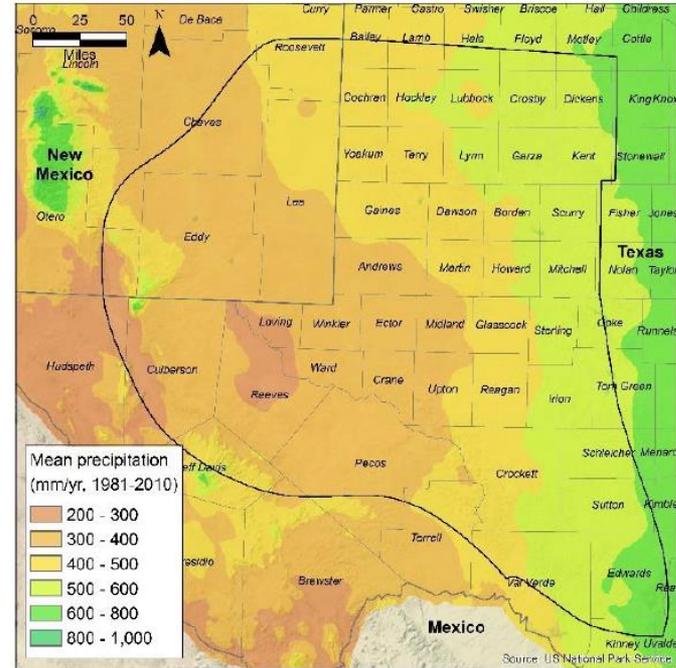
PW/HF >>



Source: Scanlon-Waste Risks Related to Transitioning from Conventional to Unconventional Oil Production in the Permian: Data 2005-2015; hydraulic fracturing water to oil ratios, produced water to oil ratios, and produced water to hydraulic fracturing ratios

# Supply Constraints

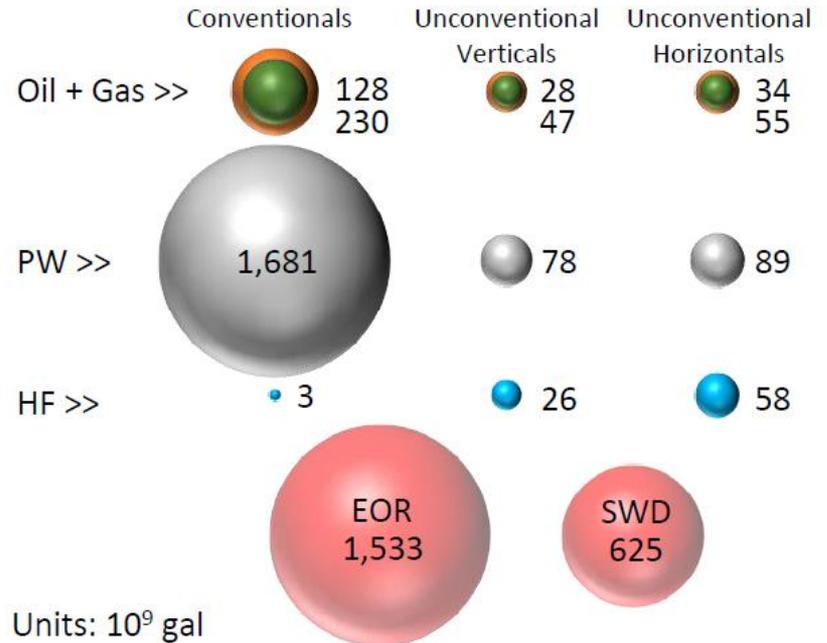
- Majority of Delaware Basin is in an area classified as arid, receiving less than 19 inches of rain per year
- Heavy reliance on groundwater to supply municipal, agricultural, and industrial needs
- Heavy declines due to groundwater mining are greater than 5 ft/yr in some areas



Source: Prism Climate Group, <http://prism.oregonstate.edu/>

# Disposal Landscape

- Proliferation of midstream water management companies has allowed water haul to pipe conversion for smaller operators and those with disaggregated acreage
- We believe high water cuts in the Delaware coupled with production growth rates may result in disposal capacity limitations for the play



Source: Scanlon-Waste Risks Related to Transitioning from Conventional to Unconventional Oil Production in the Permian: Data 2005-2015

## Sustainable Operations-NM 546

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The Produced Water Act is intended to encourage the reuse and recycling of produced water, particularly for use within the oilfield thereby relieving stress on available water supplies and disposal infrastructure across the play.

The Act **creates necessary clarity** to encourage investment in the recycling and reuse of produced water considering ability to transact (possessory interest/ownership) and liability.

The Produced Water Act also takes the first step in clarifying regulatory oversight for produced water use within the state.

The Act prevents landowner's from forcing the use of fresh water.

The Produced Water Act was **widely supported** by state regulators, industry, agriculture, and environmental groups due to the potential benefits for multiple stakeholders. It was passed unanimously by the House of Representatives and by a large majority in the Senate.

## Status of the Law Prior to 2019

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In 2004, the Oil and Gas Act was amended to give EMNRD jurisdiction over produced water uses. Unfortunately, that amendment was unclear as to the interest recycling companies could take in the water both during and after recycling.

EMNRD had promulgated regulations to authorize recycling of produced water and allowed for the use of recycled water in oil and gas operations.

The statutes were somewhat unclear as to NMED authority over recycling, treatment, and reuse.

Liability seemed to remain with the O&G Operator.

Comments were made by New Mexico Representatives during Committee Hearings that water in the Northwest could be cleaned up to “fresh water status,” but operators were afraid of potential liability. The result was injection of recycled/treated water.

# Produced Water Act

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The Produced Water Act is located in Chapter 70 NMSA 1978 and defines the terms “operator,” “produced water,” “recycled water,” and “treated water.”

## Clarified agency jurisdiction to regulate the disposition of produced water (PW).

- The Oil and Gas Act (Section 70-2-12 NMSA 1978)
  - to regulate the disposition, handling, transport, storage, recycling, treatment and disposal of produced water during, or for reuse in, the exploration, drilling, production, treatment or refinement of oil or gas, including disposal by injection pursuant to authority delegated under the federal Safe Drinking Water Act, in a manner that protects public health, the environment and fresh water resources.
- The Water Quality Act (Section 74-6-4 NMSA 1978)
  - The WQCC shall adopt regulations to be administered by the department of environment for the discharge, handling, transport, storage, recycling or treatment for the disposition of treated produced water, including disposition in road construction maintenance, roadway ice or dust control or other construction, or in the application of treated produced water to land, for activities unrelated to the exploration, drilling, production, treatment or refinement of oil or gas; and
  - may adopt regulations to be administered by the department of environment for surface water discharges.

## Created a possessory interest and defined liability.

- Confirmed no permit is needed from the Office of the State Engineer to use produced water and do not need to acquire a water right to use it
- Provides oil field entities to have a possessory interest which includes the right to sell, convey, transport, recycle, treat, reuse, and retain proceeds.
- Clarifies that when produced water is transferred between parties, the party possessing the water is liable (unless otherwise specified by law or contract)
- Requires a permit to be obtained by NMED prior to using for uses regulated under the WQA

# Produced Water Act-cont'd

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## Provides incentives for operators to use recycled water.

- Prohibits surface owners from forcing parties to purchase fresh water for O&G use when recycled or treated water is available and the operator wants to use recycled water. This provision does not apply to existing agreements
- Prohibits surface owners from forcing parties to purchase fresh water, brine or brackish water when recycled or treated water is available for use.
- Prohibits private parties from charging a tariff for the movement of produced water on State Surface Lands without provides transport services. Private parties do not have a right to charge transportation tariffs for the use of state lands under grazing and surface leases.

**The Act went into effect July 1, 2019 and does not apply to contracts entered into prior to that date.**

# Supplementation of State Water Resources

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**The Produced Water Act clarified the regulatory jurisdiction to allow for the potential to use treated produced water for needs outside the oil industry.**

New Mexico is west of the 98<sup>th</sup> meridian which qualifies the state to utilize both 40 CFR Part 435 and 437 of the Clean Water Act.

- Part 435 allows for discharge of treated oilfield waste water to waters of the US for beneficial reuse. 435 is only allowed west of the 98th meridian
- Part 437 allows for discharge of treated oilfield waste by centralized waste treatment facilities

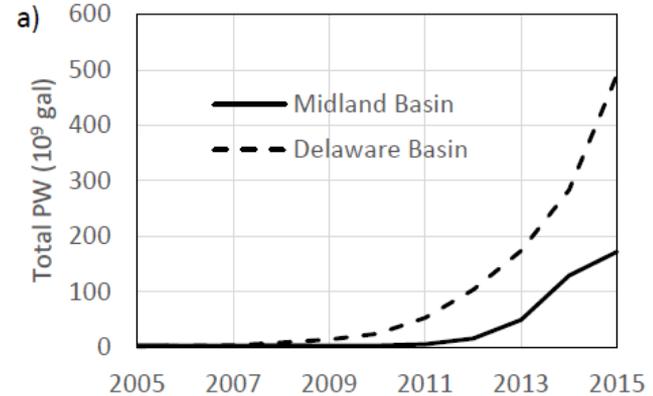
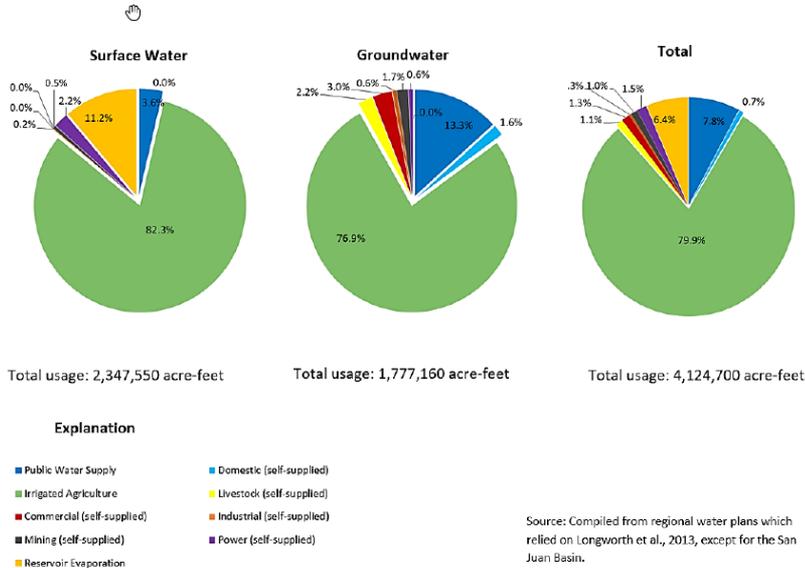
New Mexico does not currently have delegation of authority from the Environmental Protection Agency to issue discharge permits to federal waters.

The ability to treat and discharge produced water may also provide operators with an alternative water management tool.

# State Water Use

80% of water demand in NM is for agriculture

-Produced water in Delaware ~1.5MM acre-feet



Source: Scanlon-Waste Risks Related to Transitioning from Conventional to Unconventional Oil Production in the Permian: Data 2005-2015



Figure 4-1. Statewide Water Withdrawals by Use Category in 2010.

# Produced Water Quality and Options

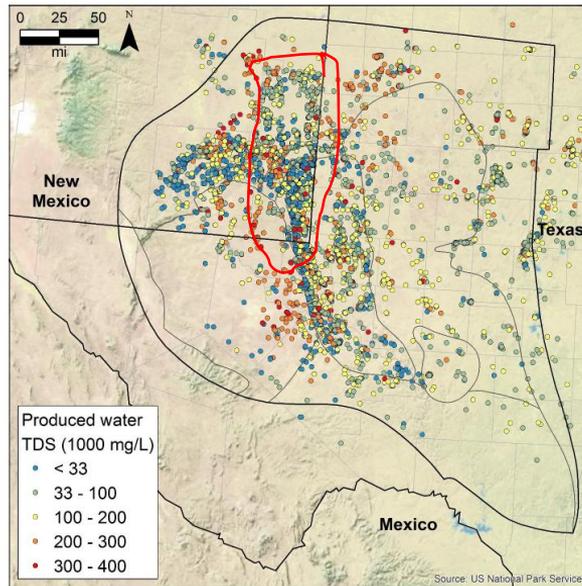


Fig. S36. Distribution of produced water total dissolved solids (TDS). (<https://energy.usgs.gov/EnvironmentalAspects/EnvironmentalAspectsOfEnergyProductionandUse/ProducedWaters.aspx>)

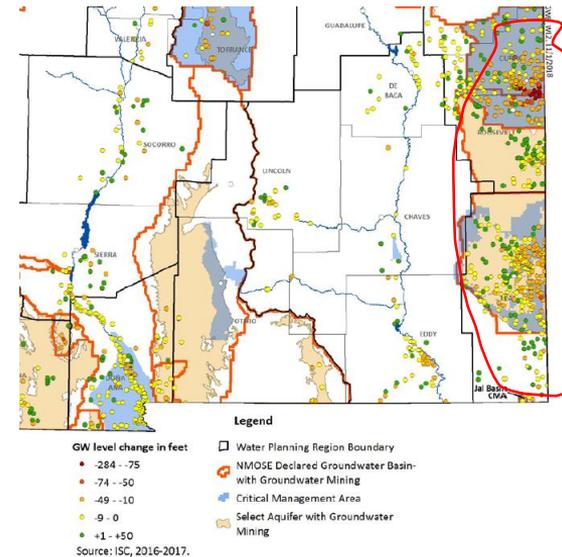


Figure 3-9. Critical Management Areas, Change in Average Water Level (1985-1995 to 2005-2014) and Declared Groundwater Basins with Mined Aquifers.

Source: 2018 New Mexico State Water Plan Part II: Technical Report

# Final Thoughts

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Creative use of a waste product can lead to **lower costs and more sustainable operations** for the unconventional oil and gas industry.

Water midstream infrastructure attracted by unconventional operations can be leveraged by conventional operators to **reduce their operating costs**.

Thoughtful application of **technology coupled with robust regulation** and monitoring could be utilized to both supplement state water resources and provide additional produced water management options to industry.

# Q&A

A photograph of an oil drilling rig in a field at sunset. The rig is on the left side of the frame, and the sun is setting on the right, creating a warm, golden glow. The sky is filled with wispy clouds. The text "THANK YOU" is overlaid in the center of the image.

THANK YOU