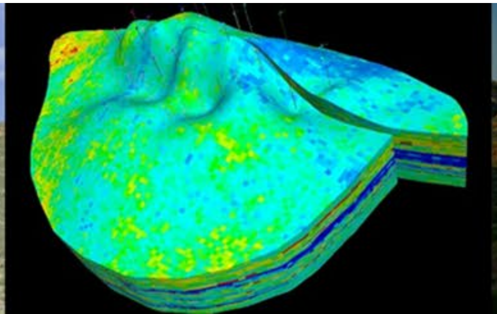
Impact of Federal Drilling and Leasing Moratorium on Wyoming's Legacy (Conventional) Oil Fields

Focus on Improved and Enhanced Oil Recovery

February 2021

Enhanced Oil Recovery Institute

Summary of Executive Orders

Actions taken by the Biden administration in January 2021 will have a direct impact on Wyoming's economy.

- President Biden's Executive Order (EO) 13990 and Section 208 of Executive Order on Tackling the Climate Crisis at Home and Abroad
  - Agencies must review all actions taken during the Trump administration to determine if they are inconsistent with or present obstacles to the Biden administration's policy on climate change
- Acting Secretary of the Interior de la Vega's Order 3395
  - Temporary suspension of delegated authority to issue any offshore or onshore fossil fuel authorization (including leases and permits to drill)

Governor Gordon's response to the actions taken by the Biden administration

- EO-2021-01
  - Evaluate the estimated effect of the President's EO 13990 on the production of oil and gas and related jobs within the State of Wyoming

<u>EORI has evaluated the impact of these orders on Wyoming's legacy conventional oil fields</u>

Screening Criteria Used for Selecting Affected Conventional Oil Fields

- All data obtained from public sources
- Gas fields were excluded
- Fields that haven't produced since 2010 are assumed to be abandoned and were excluded
- Excluded estimates for unconventional/horizontal drilling projects as they have been quantified by Dr. Timothy J. Considine, School of Energy Resources, University of Wyoming (full report at https://www.wyopipeline.com/wp-content/uploads/2021/02/2020_Impacts-Federal-Leasing-Drilling_Considine_SER.pdf)

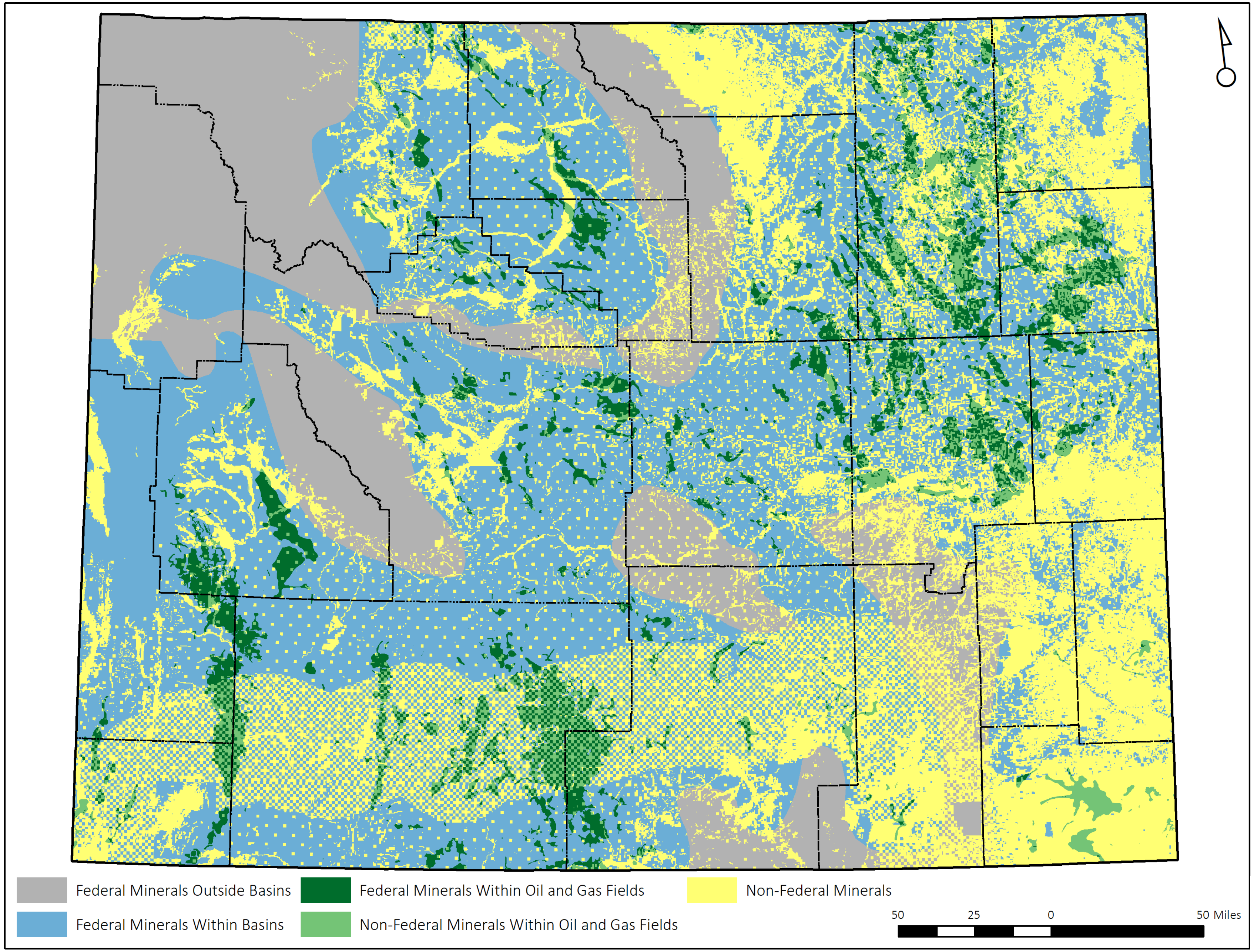
Assumptions for Evaluating At-Risk Reserves from Conventional Oil Fields

- 25% or greater federal ownership of the minerals in a field will trigger federal control and the drilling moratorium for the entire field
- All fields are assumed to have improved (water flood) and enhanced oil recovery (CO_2, ASP, etc.) potential
- Water floods (including polymer-augmented water floods) may require infill wells, but can continue without them
  - New and existing floods in federally controlled fields will proceed at 25% reduced total recovery compared to water floods in non-federal fields
- EOR projects require infill drilling to implement
  - Existing projects in federally controlled fields will continue at reduced recovery compared to EOR projects in non-federal fields
  - There will be no new EOR projects because such projects require additional drilling to be cost-effective

Methods Used for Evaluating At-Risk Oil from Conventional Oil Fields

- Production numbers for each well in the state were summed to obtain data on a field level
- Analyses were performed at the field level
  - Original oil in place
  - Remaining recoverable reserves
  - Impacted reserves
- Analyses at the field level were integrated to obtain statewide totals

Federal Mineral Ownership within Productive Basins



- 47% of surface[1] and 68% of minerals in Wyoming are owned by the federal government
- 60% of the minerals within oil basins are owned by the federal government
- 671 fields fit the screening criteria
- Federal government controls 75% of fields based on EORI's assumptions
- Federal Drilling & Leasing Moratorium Web Map

[1]Considine, Dr. Timothy J. "The Fiscal and Economic Impacts of Federal Onshore Oil and Gas Lease Moratorium and Drilling Ban Policies." 2020.

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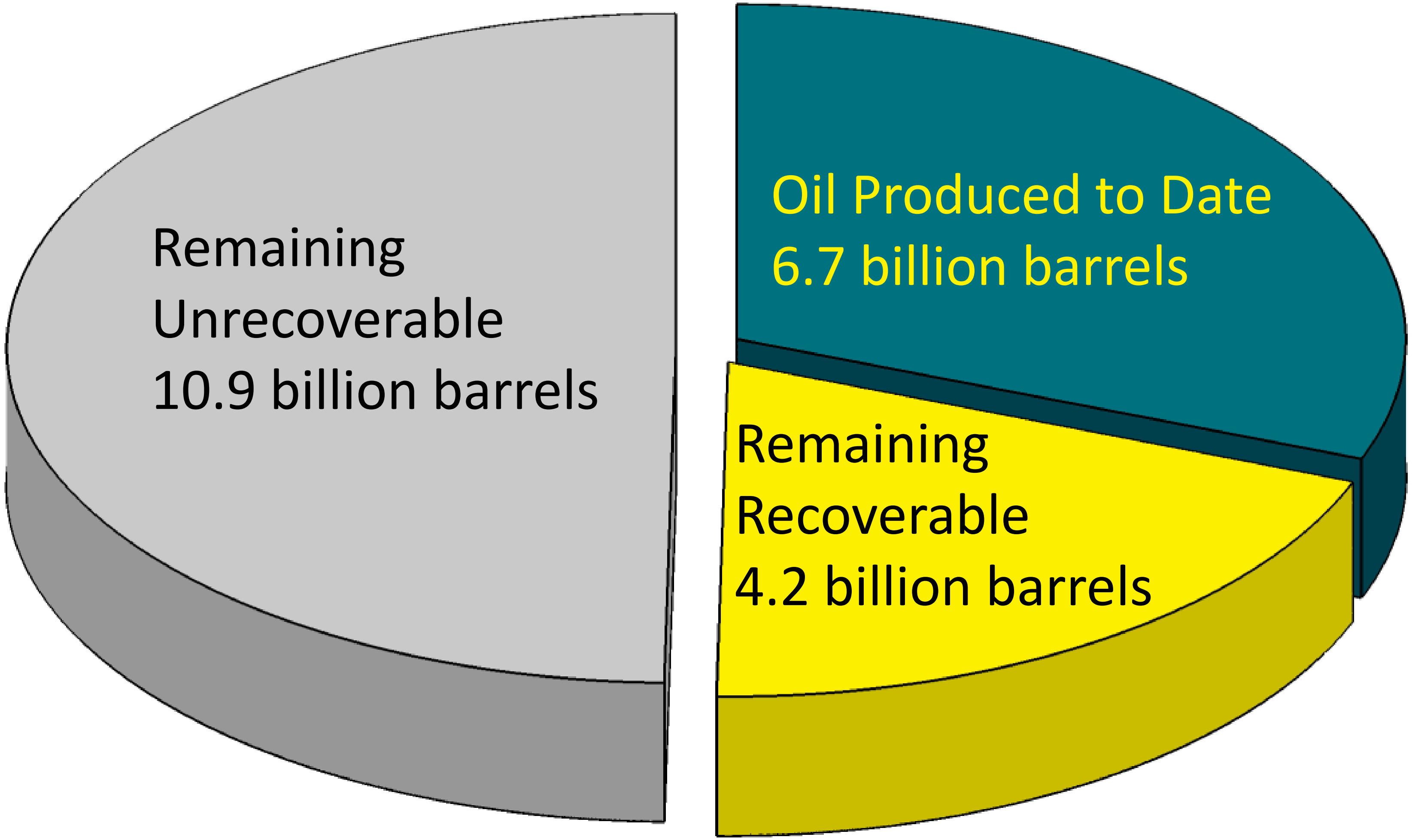
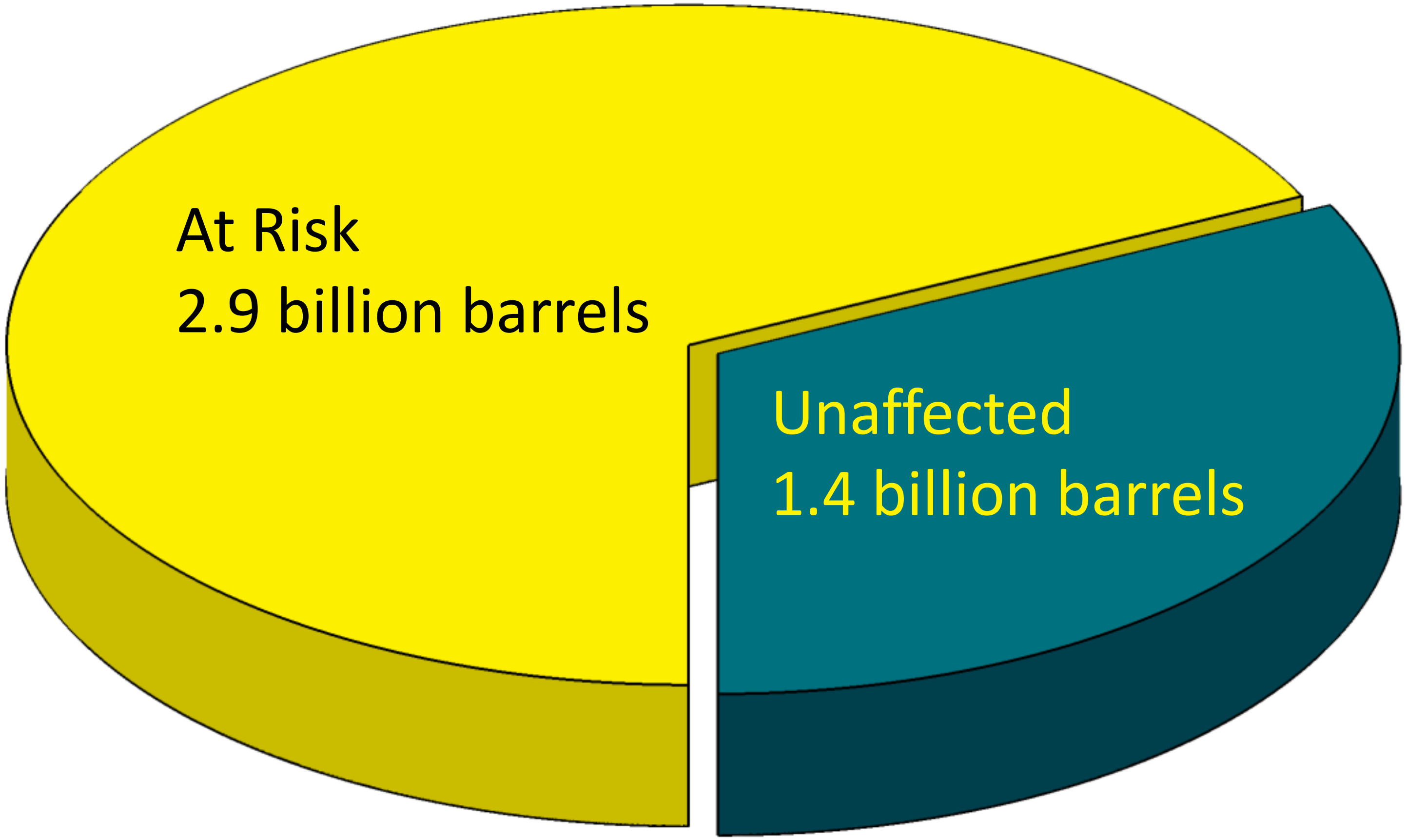
Original Oil in Legacy Fields

Total = 21.8 billion barrels



Potential Oil Reserves At Risk from Legacy Fields



- 67% (2.9 billion bbl) of recoverable reserves are at risk due to the EO eliminating new drilling on federal lands
- At $50/barrel and using a weighted-average tax rate of 8.9%, Wyoming will lose $12.9 billion in tax revenue
- Tax revenue estimated only on oil production and does not include:
  - State mineral royalties
  - Associated gas production
  - Taxes on ancillary industries that support oil production
  - Lost jobs

Appendix

State Taxes and Federal Royalties

- Federal Royalty: 12.5%
  - https://pawyo.org/facts-figures/
- State Severance Tax: 6%
  - http://revenue.wyo.gov/mineral-tax-division
- State Ad Valorem: 6.9% (average)
  - https://www.blm.gov/policy/ib-wy-2018-002
- Weighted-Average Tax Rate: 8.9%
  - 60% Fed @ 6.25% (half of total Fed 12.5% comes back to state)
  - 40% Non-Fed @ 12.9%

Sensitivity to Federal Ownership