



# USING PRODUCED WATER IN NEW MEXICO- RECENT DEVELOPMENTS AND COLLABORATIONS

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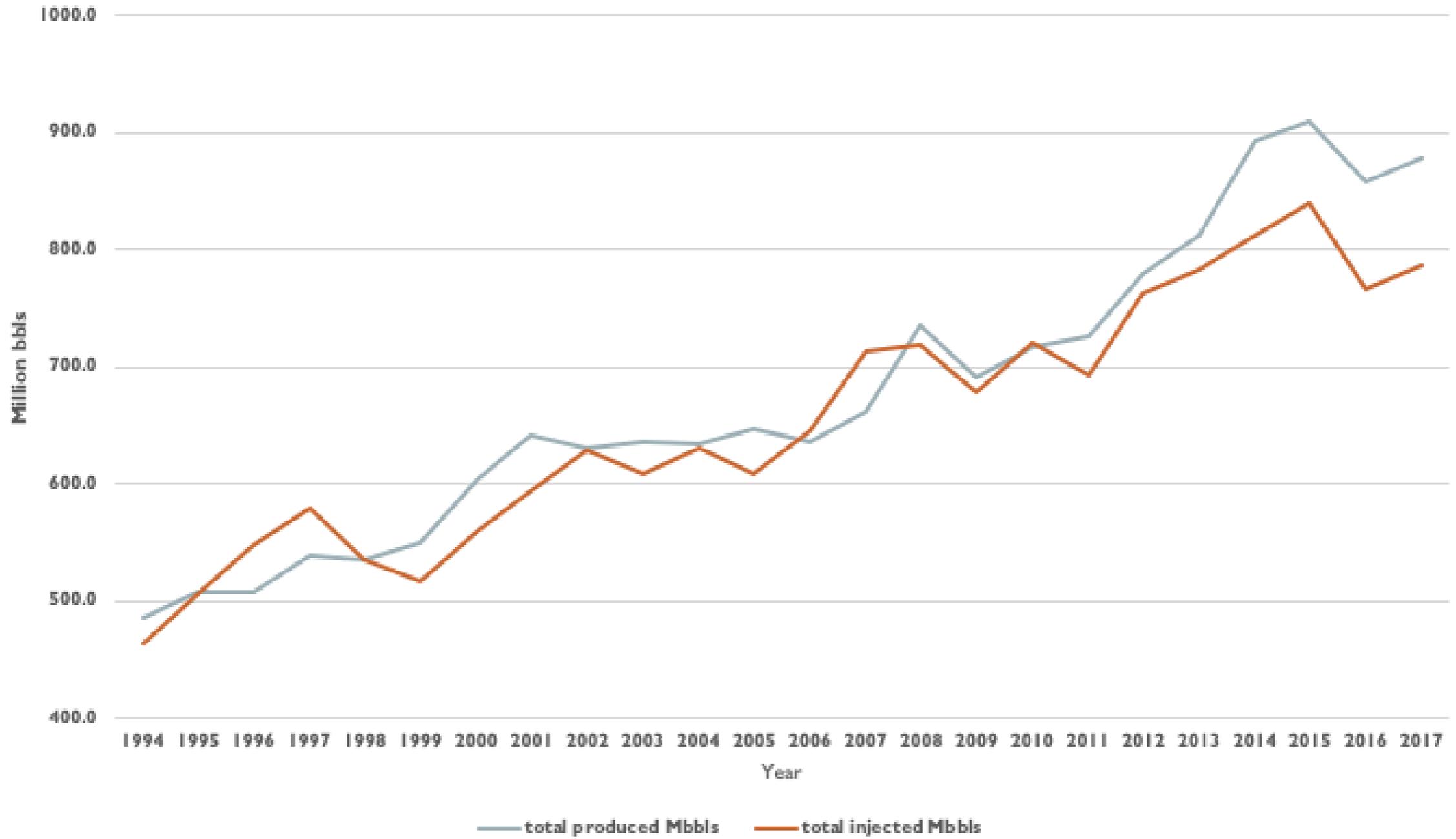
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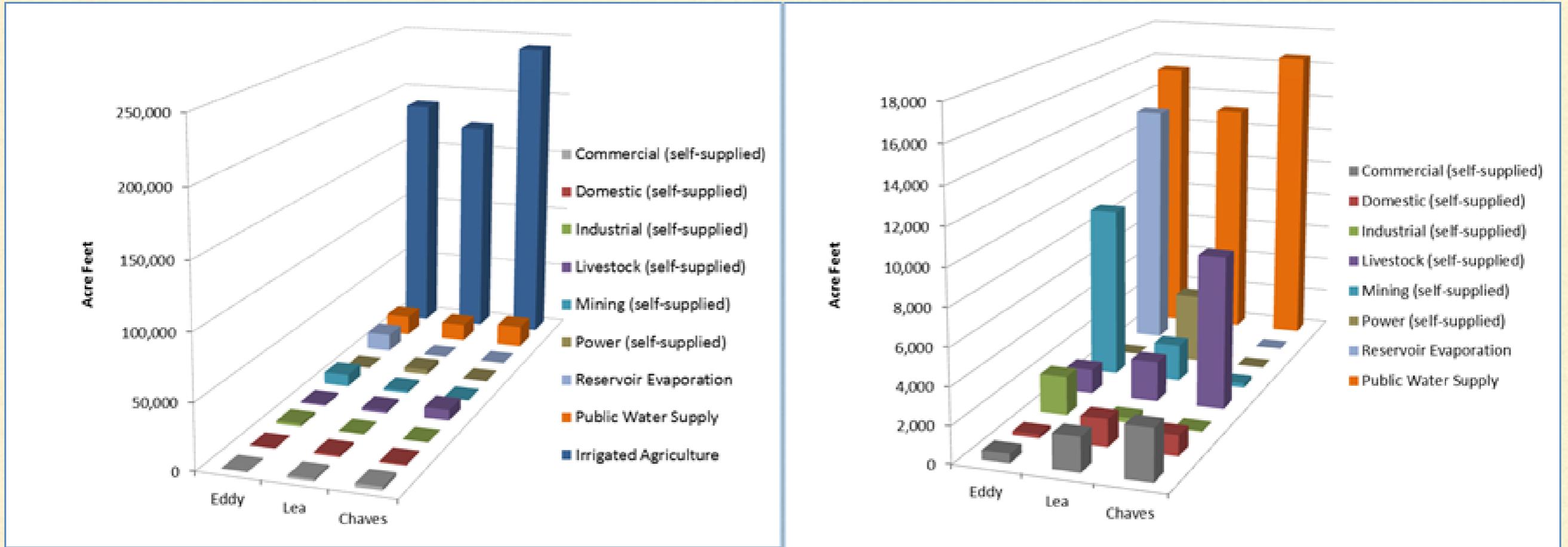
# CONCERNS



- Coproduction of produced water is increasing because of greater drilling activity and well completions
- Disposal capacity is decreasing, because of pressure increases and concerns about induced seismicity
- Water use for drilling has increased substantially as a result of hydraulic fracturing (>1M gal/frac)
- Fresh water sales (in NM) to oil and gas are common and have increased

### Water Produced and Injected New Mexico All Locations 1994-2017





How much fresh water does oil and gas use?

Not much compared to agriculture.

But, note that 2000 ac-ft of recycled water (2018 estd) is about ¼ of the fresh water used for mining (Eddy Co.)

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# SOME CONCEPTS

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- Produced water has historically been disposed in deep injection wells
- Recently, produced water has been used for well drilling and completion activities, most commonly for hydraulic fracturing
- This use can substitute for, and thus conserve, fresh water resources
- Use of produced water *outside of the oil and gas industry* is another way to substitute for, conserve, and possibly replace fresh water
- Understanding the complex situation surrounding “outside use” is progressing on multiple fronts



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# SOME “OUTSIDE USES”

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- Aquifer Storage and Recovery
  - Agriculture, Stock Watering
  - Cooling Towers
  - Industrial brines/salts
    - Salts (pool salt, road salt)
    - Minerals (lithium, potassium)
    - Chemical brines (acids, bases)
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# BRIEF HISTORY OF PRODUCED WATER REUSE STUDIES IN NEW MEXICO

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- 2000-2016 Research at Santa Fe Community College, UNM, NMSU, Los Alamos National Lab, Sandia National Laboratories, Water Resources Research Institute, Petroleum Recovery Research Center, NM Tech
  - 2014-2016 Governor's Drought Task Force-Brackish and Produced Water work groups — <https://nmwrri.nmsu.edu/produced-water/>
  - 2017-2019 Ground Water Protection Council report on Produced Water Use (to be released late spring 2019, National Focus) — <https://www.gwpc.org>
  - 2018 EPA/State of New Mexico MOU and draft report on regulatory framework — <https://www.epa.gov/uog/memorandum-understanding-between-state-new-mexico-and-epa-governance-produced-water-new-mexico>
  - 2018 New Mexico Desalination Association (NMDesal) Produced Water Conference “Policy, Regulations, and Economics to Support Total Resource Recovery” — <https://nmdesalassociation.com/nm-produced-water-conference-2018/>
  - Some relevant pending legislation: HB 546 *Clarifying ownership of produced water and making it against public policy to require purchase of fresh water for oil and gas operations* — <https://www.nmlegis.gov/Legislation/Legislation?Chamber=H&LegType=B&LegNo=546&year=19>
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# WHY A CONFERENCE?

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- Heightened concern about diminishing fresh water resources in the south and eastern parts of the state
  - Requests from multiple state agencies and other regulatory entities
  - Desire for knowledge from wide range of people including regulators, businesses, academics, students, and the public
  - Desire for a New Mexico-specific focus; not oil and gas industry centric
  - Desire to influence policy from the standpoint of technical expertise
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# CONFERENCE SESSIONS

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- Plenary Session – State Administrators and Federal EPA national and regional representatives
  - Current Issues, Policies & Regulations Regarding Produced Water
  - “The Art of the Possible”: Technical & Economic Challenges and Opportunities for Produced Water Recovery, Use & Reuse
  - Infrastructure Build-Out for Multiple Users: Financial/Capital, Engineering, Legal and Market Considerations
  - Produced Water Reuse: Why? And How?
  - A policy development listening session at the end of the meeting.
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# POLICY SESSION TOPICS

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- How do we define purified produced water?
  - How do we deal with solid and liquid wastes and product streams?
  - What is the cost to purify produced water, and how do we mitigate the cost?
  - What do we do with the water when treated?
  - What infrastructure is needed to handle, dispose, and use the water?
  - Additional Topic: Stakeholder engagement and social factors
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# SUGGESTIONS TO ACCELERATE PRODUCED WATER REUSE/USE

- All involved entities collaborate to preserve fresh water and eliminate FW use in the oil and gas industry
- Reduce disincentives and establish incentives for produced water reuse – Taxes/Rebates/Fees/Legislation
- Tie incentives to reduction in fresh water use in oil and gas operations
- Standardize produced water treatment; resource recovery technology cost and performance evaluations are needed – Example is Canadian Oil Sands Alliance
- Develop a Resource Recovery Infrastructure Master Plan
- Use Public-Private Partnerships
- Establish proactive Stakeholder Engagement
- Increase State of New Mexico Energy and Oil Conservation Division professional staff

# WHAT WE LEARNED



- Major stakeholder concerns:
  - Fresh water depletions or shortages
  - Human health affected, environment degraded
  - Sustainable stewardship of air, water and land
- We have technology that is sufficient to treat the water to high standards
- Our regulatory framework is in good standing to allow various uses, with some exceptions
- Our regulators want more fundamental knowledge about PW, and want to collaborate across agencies when outside uses increase

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# WHAT WE LEARNED- RESOURCE RECOVERY

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- Total resource recovery is a viable option — extract not only fresh water but other mineral or industrial resources from PW
- Resource recovery is one way to reduce the very large volumes of waste expected from treatment
- We will need to develop planning and coordination mechanisms to enable extraction, transport, storage, and use of these resources
- Determining who will pay for resource extraction will be location-specific, and may be driven by additional factors such as water compact delivery obligations, comparative pricing of resources, transportation factors, and changes to traditional industrial practices

# WHAT WE LEARNED— STAKEHOLDER OUTREACH

## Demonstrators protest outside 'produced water' conference in Santa Fe

By Steve Terrell | [sterrell@sfnewmexican.com](mailto:sterrell@sfnewmexican.com) Nov 16, 2018



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- Protestors outside the conference provided an opportunity to consider social factors and broad outreach to stakeholders-particularly rural and minority communities.
- Clarity of message is important in a world dominated by social media
- Outreach should be started early and should be comprehensive within relevant communities

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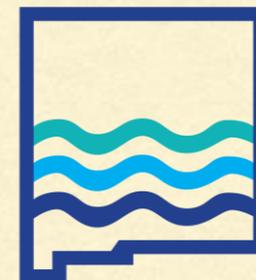
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