



NM Produced Water Research Consortium

Overview, Focus, Organization, and Approach

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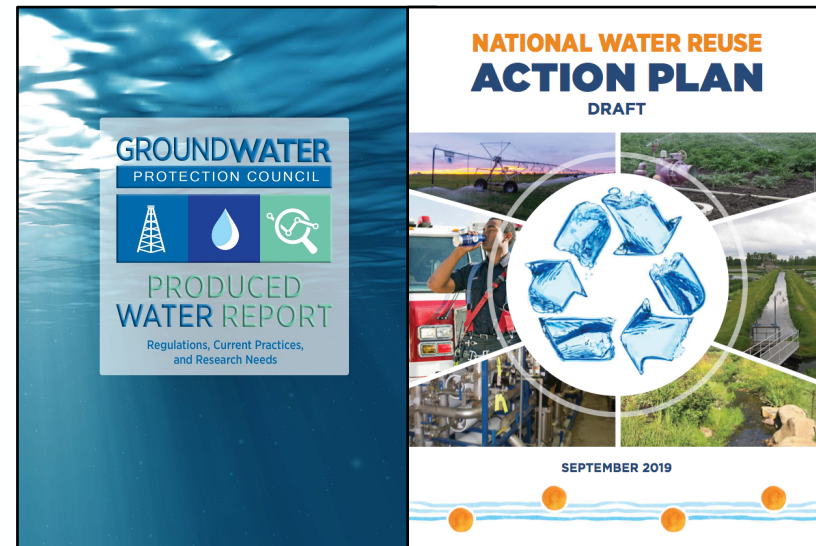
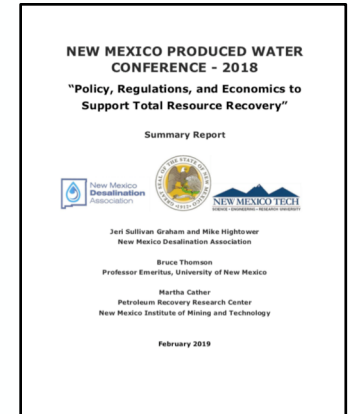
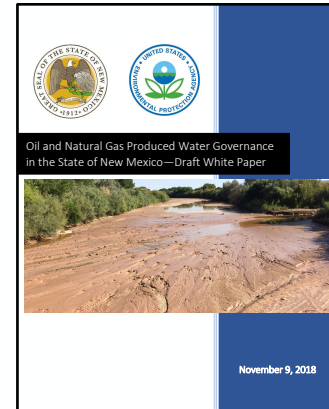
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RECENT NM PRODUCED WATER REUSE EFFORTS

- NM EMNRD working group on streamlining produced water jurisdiction 2015-2017
- 2018 EPA MOU to explore produced water reuse intricacies in western states
- NM Desal Association Workshop on Produced Water Reuse – 2018 (160 attendees)
- Major recommendation was to “pursue a cooperative treatment technology evaluation program”
- Input on GWPC produced water research needs report - 2019
- Increased DOE and BOR desalination research funding for produced water
- Coordinate with EPA to lead produced water efforts in new national water reuse program



NM 2019 PPRODUCED WATER ACT, HB 546

- Through the Act, statutory and regulatory authority for the reuse of produced water was modified:
 - Reuse inside oil and gas sector remains under the Oil Conservation Division (OCD) of the NM EMNRD
 - **Reuse outside the oil and gas sector, was designated to the NM Environment Department (NMED)**
- The Act encourages produced water reuse outside oil and gas to:
 - enhance fresh water sustainability,
 - reduce or eliminate fresh water use in the oil and gas sector,
 - support new economic development opportunities,
 - maintain public and environmental health and safety.

This transition is an emerging regional trend – OK and TX

NMED and NMSU SEPTEMBER 2019 MOU ESTABLISHED THE CONSORTIUM

- Independent third-party to evaluate emerging technologies.
- Collaborative environment to engage government, university, industry, and NGOs.
- National Academy of Science method to address science and data gaps to inform regulations and policies.
- Support NMED and state agencies in public outreach and education.



<http://nmpwrc.nmsu.edu>

CONSORTIUM GOALS AND OBJECTIVES

- Coordinate a focused research, development, and evaluation program for produced water reuse outside oil and gas,
- Collaborate with state and federal health and resource management agencies, academia, industry, and NGOs and their technical experts,
- Fill science and technology gaps and accelerate innovative technology cost and performance testing, and
- Address fit-for-purpose treatment requirements for a range of applications - industrial, road construction, agriculture, rangeland, municipal, aquifer storage, surface supplies, mineral recovery, etc.

CONSORTIUM ORGANIZATION



Modeled after DOE Innovative Treatment Remediation Demonstration Program and EPA Environmental Technology Verification (ETV) Program

MEMBERS AND PARTICIPANTS

- **Members**

- About 70 members
- Oil and Gas Industry, Universities, NGOs Associations, Midstream, Technology Companies,
- Broad stakeholder input on directions, issues, and challenges

- **Government Advisory Board**

- 15 state and federal land and resource management agencies
- Provide direction and guidance on regulations and policy issues

- **Technical Steering Committee**

- Coordinate R&D, identify analysis, research, development, testing, evaluation gaps and priorities based on membership and government input
- Six working groups –water quality, quantity, treatment, infrastructure engineering, applications, risk and toxicology
- Member technical experts representing five sectors – oil and gas, midstream, NGOs, academia, state and federal resource agencies

Government Advisory Board

New Mexico Environment Department – Lead

New Mexico Department of Health

New Mexico Energy Minerals and Natural Resources - OCD

New Mexico Department of Agriculture

New Mexico Office of the State Engineer

New Mexico Water Resources Research Institute

New Mexico Department of Indian Affairs

New Mexico State Land Office

New Mexico Economic Development Department

US Environmental Protection Agency

US Geological Survey

US Department of Energy

US Bureau of Reclamation

US Bureau of Land Management

Oklahoma DEQ (and others)- Observers

(All agencies have a representative on the Technical Steering Committee)



CONSORTIUM OPERATIONAL APPROACH

- 3-year, \$2M per year effort, focused on 4-5 major research projects and 4-5 smaller evaluation projects per year.
- Utilize in-kind support from oil and gas, midstream facilities, and county and federal facilities for produced water characterization and conduct of pilot-scale testing.
- Leverage funding from Sponsors, federal and state grants, matching funds, etc. to accelerate efforts.
- Six technical working groups – applications, infrastructure and engineering, treatment, water quality characterization, water quantity characterization, health and toxicology.

Research and Development Priorities

The transdisciplinary research and development efforts will be focused to fill the following data and knowledge gaps:

- Quantify and characterize produced water generated from conventional and unconventional methods. Include identification of all constituents in produced water unique to respective basins and formations, as well as chemical additives;
- Assess the cost-effectiveness of emerging treatment approaches for produced water from conventional and unconventional methods for a range of applications - road construction, rangeland rehabilitation, agriculture, livestock production, industrial applications, municipal applications, aquifer storage and recovery, surface water discharge, mining and mineral recovery, or other uses;
- Quantify and characterize cost and effectiveness of mineral recovery for strategic minerals, such as lithium, rare earths, acids, bases, salts, etc.;
- Quantify and characterize cost effectiveness of brine management and disposal;
- Establish analytic sampling methods for constituents of concern and sensitivity to appropriate levels of treated produced water; and
- Assess the impact of treated produced water on public health and safety, bioaccumulation and toxicity in soils, flora and fauna, surface water and associated biota, and ground water resources.