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From: duff will [redacted]
Sent: Tuesday, November 13, 2018 2:23 PM
To: water, renewable, EMNRD
Subject: Public comment on Oil and Natural Gas Produced Water Governance in the State of New Mexico—Draft White Paper

Members and Staff,
MNNRD Workgroup

Dear Folks,

I am a resident of Bernalillo County, NM, living in the rural area of the East Mountains thirteen miles south of U.S. 40. These are my comments on the draft white paper.

NO PREMISE OF RESPONSIBILITY

There are clearly substantial costs to any of the proposed solutions to the huge problems outlined in this paper. Who is responsible for these costs? Are these costs going to become part of the operating expenses of the industry that benefits from production? Is the public going to have to foot the bill as another subsidy to the oil/gas industries? Will these costs be absorbed by the end users of the reclaimed water?

MISSING INFORMATION

After slogging through the proposed white paper, I note another important set of missing facts and figures necessary to make rational decisions:

> There is no capital estimate for the "treatment" facilities featured in many of the graphics, nor are operating costs estimated.

> It is unclear how effective the proposed treatment procedures are, nor whether there are variations in processes with differing effectiveness and/or costs.

> I find no clear information about the likely market value for the treated water or byproducts in any of the proposed scenarios (Agriculture, Municipal, Industrial, etc.)

> There is no assessment of risks to aquifers/ surface waters from injecting untreated water from oil and gas production to aquifers, nor any mention of seismic risks as experienced in Oklahoma (which might apply to either treated or untreated water).

> There is no assessment of risks from disposing of "waste" after treatment, either by injection or deposition in landfills, nor discussion of landfill specifications.

MISSING IN GENERAL Enough financial, market and risk information to evaluate the proposals.

ALTERNATIVE ACTIONS

The case does not seem to be made for action/ no-action. To comprehend this problem, a clear assessment needs to be made about what inaction implies. What will happen to groundwater, surface water and the general problem of inadequate water supplies in the decades ahead if NOTHING IS DONE? Lip service to the importance of taking action is addressed primarily in, "...produced water re-use and recycling is of the utmost importance to New Mexico." While this sounds serious, the actual facts of this need to be as explicit and detailed as the current science allows.

The case is made in the opening pages of the white paper that water supply in general, and potable water supply specifically, is challenged by the conditions in the state of New Mexico. It might be concluded that it is imperative for the survival of much of our citizenry, and that something must be done. The solutions outlined in this paper may be effective, affordable and sustainable, but as a layman I find no way to judge.

MY HEARTFELT RECOMMENDATIONS

Start with the "who is going to pay?" question, and describe "how much?" Assure yourselves (and us citizens) that the solutions you settle on will solve the problems definitively and well into the future (a century, perhaps). Establish enforcement procedures - and the budgets to support them - that assure that your plan will be executed.

Thank you for your efforts, your time and your dedication. Good luck to us all.

Will Duff
[redacted]

From: R B [redacted]
Sent: Wednesday, November 14, 2018 1:16 PM
To: water, renewable, EMNRD
Subject: Renewable water

Follow Up Flag: Follow up
Flag Status: Flagged

Recycling fracking water isn't the point which is nonsense anyway. There should be no fracking that requires water we can't spare in the first place. I can't even get safe drinking water from Los Ojos anymore and you geniuses are letting fracking continue. Thanks for ruining our present and future.

Rick Byerly
El Vado NM

From: Mary Harrison [redacted]
Sent: Wednesday, November 14, 2018 9:53 AM
To: water, renewable, EMNRD
Subject: Recycling oil/gas water

Follow Up Flag: Follow up
Flag Status: Flagged

Protect ALL water supply. Oil and gas are not sustainable sources of energy. Think of the millions of fish throwing themselves up onto the beaches of Lake Michigan, in order to escape contamination. Or, picture the frog my 5 y daughter brought me from a prize bass fishing lake with a 5th leg protruding from it's stomach. Oil and gas water byproducts are not renewable.

You will be held accountable for your decision regarding this.

Sent from my iPhone

From: Susan Meadows [redacted]
Sent: Thursday, November 15, 2018 5:05 PM
To: water, renewable, EMNRD
Subject: Comment on the Oil and Natural Gas Produced Water Governance in the State of New Mexico—Draft White Paper

Dear Sir/Madame:

Find below my response to the request for public comments released on November 9, 2018 by the New Mexico Energy, Minerals, and Natural Resources Department's on the Draft White Paper on Oil and Natural Gas Produced Water Governance in the State of New Mexico (see http://www.emnrd.state.nm.us/wastewater/index.html)

The Draft White paper sets out the problem regarding the seriousness of ongoing and expected water shortages in New Mexico. The paper also discusses the significant amounts of water involved in oil and gas production. The oil and gas industry's term for this water is "produced water," however this term is misleading. While some water may derive from the geological formation in which the oil or gas well is drilled and is a byproduct of drilling, fresh water mixed with chemicals is also used to increase pressure in the oil field stimulating oil and gas production. Much if not all of the water industry terms "produced" is actually a mixture of formation water, injected water, chemicals, and oil. As a result, large amounts of fresh water, which may be ground or surface water or a combination, are converted into wastewater (the term I will use) in oil and gas production. The White Paper does not, however, address the wisdom of granting virtually unrestricted use of New Mexico's limited water supply for oil and gas production (see below), nor does it discuss curtailing the use of water for this purpose. These omissions are primary and glaring.

The Paper also points out several problems with reuse of wastewater from oil and gas drilling. It discusses briefly (page 18) reuse of wastewater by the industry itself as a conservation measure. The Oil Conservation Division (OCD) is often the sole regulator under many conditions but it only "encourages" rather than requires reuse of wastewater by the industry. Because permits for using fresh groundwater may be issued by the Office of the State Engineer (OSE) apparently without significant review (see 1 below), the only incentive industry has to reuse contaminated wastewater is the permit required to dispose of it elsewhere. The Draft White Paper gives no statistics on the percentage of wastewater that is actually reused by the oil and gas industry in New Mexico.

There are several issues I would term problematic with the Draft White Paper:

1) The OSE and OCD have wide ranging responsibilities respectively regarding groundwater used by the oil and gas industry and wastewaters produced by them, but it isn't clear that either of these entities have much or any significant public reporting or comment requirements or other public oversight mechanisms in place regarding many of these responsibilities. Recently, the State Land Commissioner Aubrey Dunn was forced to file suit against the OSE regarding water pumping permits issued for fracking as reported and summarized below:

"The Land Commissioner seeks an order from the Court requiring the State Engineer to stop issuing multiple groundwater permits to a single applicant for a single purpose in excess of the statutorily-allowed three acre feet per year. The Land Commissioner investigated and claims that there are a number of instances in which the OSE issued several of these temporary use permits on the same day, to the same applicant, for groundwater diversion, for a single purpose (usually to pump water to use in fracking for oil and gas operations.)"

(see https://agrilife.org/texasaglaw/2018/07/09/nm-land-commissioner-sues-nm-state-engineer-over-water-permits/)

Before potential reuses of oil and gas industry wastewater outside oil and gas production are even considered, it would seem the first order of business would be for the State of New Mexico to

a) finalize a comprehensive statewide Water Plan based on public consensus regarding priorities for the use of New Mexico waters that assigns the true value to this precious resource. It appears currently we are selling off our water to the oil and gas industry at a vastly discounted rate – an industry that is a relative latecomer in New Mexico compared to other water rights stakeholders and may not be at the top of New Mexicans list of priorities for use of our water;

b) develop guidelines and a single regulating and publicly accountable water authority for the distribution of water for various uses that would significantly guide and perform oversight of all State Offices such as OSE and OCD that are involved in the distribution of any type of water extraction or disposal permits; and

c) develop requirements for reuse rather than simply "encouraging" reuse of wastewaters produced by the oil and gas industry in New Mexico with appropriate enforcement mechanisms and oversight by the appropriate independent and publicly accountable parties.

2) Wastewaters produced in the oil and gas industry generally contain "proprietary" company-specific chemical cocktails to enhance oil and gas production. In order to consider reusing any of these waters, the actual chemical compositions of these cocktails would have to be known to design adequate treatment methods. As the oil and gas industry has long resisted revealing this information publicly it seems unlikely they will do so without a fight. The Draft White Paper seems to have overlooked this troubling problem.

3) The only regulatory criteria noted (National Pollutant Discharge Elimination System and Clean Water Act) for discharge of wastewaters are all based on individual contaminant concentrations at a single discharge or sampling point. However, this White Paper is ultimately discussing the discharge for reuse of millions of gallons of treated wastewaters that may be produced all over the State from the northwestern Bloomfield area to the southwestern Permian Basin. There is a high probability that "discharge" points will be numerous in the same watershed and ecosystem. Regulating each potential residual contaminant individually at each discharge point will not adequately address potential cumulative impacts to watersheds, human health, and the environment. These simple and inadequate measures are not enough. Carrying capacity analyses leading to comprehensive watershed and ecosystem management plans are needed. Sensitive indicators would have to be identified and baseline data would have to be collected over broad areas to determine whether the reuse of these wastewaters is feasible at all and to be able in future to identify unexpected and deleterious results from their reuse.

In summary, this White Paper while attempting to plan for future water shortages ignores the complete lack of public consensus regarding oil and gas development and that industry's wholesale use and contamination of our resources in New Mexico currently. It ignores the true value of New Mexico groundwater as our most precious resource and the current apparent mismanagement of it by unelected officials in offices that appear to hold considerable freedom to grant use of it and disposal of resulting wastewaters with little oversight or restraint by the Legislature or even Governor. It presents a foregone conclusion that the only solution will be expensive treatment and reuse of wastewater rather than laying out a plan for conservation and restriction on its use by dirty, temporary, and unsustainable industries such as oil and gas that will leave New Mexico as quickly as they arrived, saddlebags filled with money, while saddling us with devastated lands, depleted aquifers, and contaminated water of little use to ranchers, farmers, tribes, municipalities, tourists and wildlife.

Sincerely,

Susan D. Meadows, M.S Toxicology

Retired consultant to private industry, US Environmental Protection Agency, US Navy, Philippines Department of Natural Resources, State of New Mexico Environment Department, National Laboratories including Sandia National Laboratories, Los Alamos National Laboratories, Rocky Flats, Hanford, and Savannah River on issues related to hazardous and non-hazardous wastes under CERCLA and RCRA

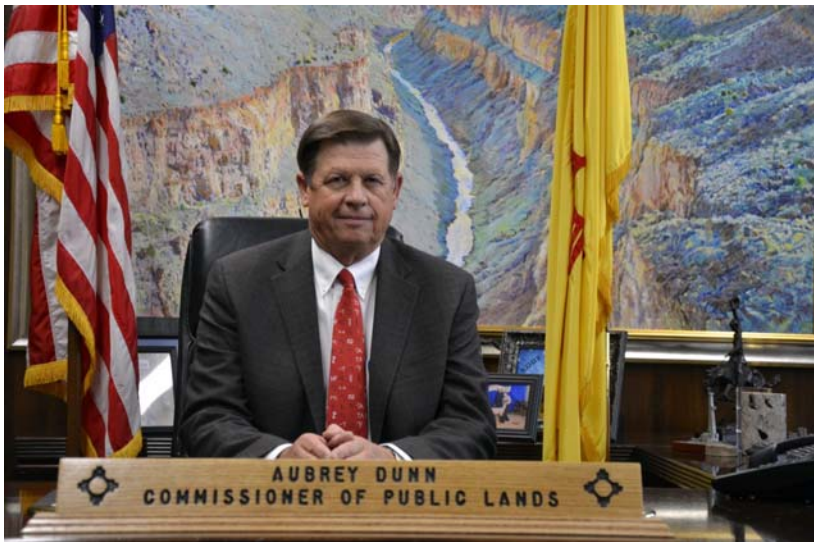
[redacted]

[redacted]

NM Land Commissioner Sues NM State Engineer Over Water Permits

Posted on July 9, 2018 by tiffany.dowell

A new water battle is brewing in New Mexico, but this time, it is between elected officials. New Mexico State Land Commissioner, Aubrey Dunn, filed suit against the New Mexico State Engineer, Tom Blaine. [Read Complaint here.]



The Land Commissioner is charged with jurisdiction over state trust lands to generate support for public schools and other state institutions. In the Complaint, filed in the First Judicial District Court, the Commissioner asserts that he has "an interest in the appropriation of water on and off of state trust lands because the use of water in connection with activities on state trust lands often is essential to the lands' highest and best use." The State Engineer is vested with authority to manage the state's water resources, including issuing permits for groundwater wells.

The Commissioner is concerned with the State Engineer's issuance of groundwater pumping permits. Specifically, the concern revolves around permits issued pursuant to NMSA Section 72-12-1.3. Section 72-12-1.3 provides that if a person seeks to use groundwater in an amount of less than three acre-feet for a period of time less than one year for prospecting, mining, or construction of public works, highways, and roads or drilling operations designed to discover or develop the natural mineral resources in the state, a temporary permit may be issued by the State Engineer. A separate application must be filed for each proposed use. If the request will not permanently impair any existing water rights of others, the permit must be granted. If it will permanently impair such rights, a hearing must be held. [Read statute here.]

The Land Commissioner seeks an order from the Court requiring the State Engineer to stop issuing multiple groundwater permits to a single applicant for a single purpose in excess of the statutorily-allowed three acre feet per year. The Land Commissioner investigated and claims that there are a number of instances in which the OSE issued several of these temporary use permits on the same day, to the same applicant, for groundwater diversion, for a single purpose (usually to pump water to use in fracking for oil and gas operations.)

For example, the Commissioner claims that from April to August 2017, the OSE issued twenty temporary use permits to two different applicants for water to be used in a gravel quarry near Carlsbad. Because of the multiple permits, this allowed use of sixty-three acre feet of water by the applicants. In another example included in the Complaint, Dunn points to three permit applications filed by Chisolm Energy in 2017, seeking to use a livestock watering well for fracking. All three permits sought water for the same purpose, but were labeled as "phase 1," "phase 2," and "phase 3." The OSE approved each application, allowing Chisholm to withdraw 9 acre-feet total from the same well for the same purpose.

It is this action, Commissioner Dunn argues, that violates New Mexico law by essentially ignoring the three acre-feet limitation in Section 72-12-1.3. "In giving the State Engineer authority to issue temporary permits for the use of up to three acre-feet of water per year, the Legislature did not intend to give the State Engineer authority to issue duplicate or triplicate permits to the same applicant to allow the use of greater than three acre-feet for the same use."

The State Engineer has not yet filed his Response to the lawsuit.

This entry was posted in Water Law. Bookmark the permalink.

From: [redacted]
Sent: Thursday, November 15, 2018 2:34 PM
To: water, renewable, EMNRD
Subject: Re-Use Of Fracking Water White Paper

Follow Up Flag: Follow up
Flag Status: Flagged

To Whom It May Concern,

In New Mexico, we are not interested in being a test-site or model-site or site for fracking or the re-use of this poisonous water for our agriculture or anything else. Our water should be used for what it is meant to, drinking and growing food. Using clean water for fracking is an atrocity in and of itself. But then sending it off for people to drink afterward is a disaster waiting to happen. We deserve clean water. Please do not encourage this type of business model in New Mexico. We already face enough environmental racism. We should be reversing these practices.

Thank you

Alicia Sofia Chavez

From: Don Debelak [redacted]
Sent: Friday, November 16, 2018 4:39 PM
To: water, renewable, EMNRD
Subject: Draft Paper on Oil and Natural Gas Wasterwater Recycling

I've worked extensively on ceramic filtration products and have done considerable work on produced water.

I worked for Liqtech NA, https://www.liqtech.com (now retired but still assisting Liqtech on a part time basis) and we can clean up water to either a surface discharge level or to full potable status.

To give you an idea on costs for a system that could clean up 7.5 million barrels of water per year, the cost would be $5 to $7 million, the annual operating costs would be $ 1.5 to $ 3.0 million. The payback period if water can be sold at $1.00 per barrel is seven years, and if the water can be sold for $1.75 per barrel, the payback period would be three years.

I live Albuquerque and would be happy to meet with you and answer any questions you might have.

For more information go to https://www.liqtech.com/markets/industrial/oil-and-gas/

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www.liqtech.com

Don Debelak
[redacted]

From: Therese Patton [redacted]
Sent: Friday, November 16, 2018 1:02 PM
To: water, renewable, EMNRD
Subject: Proposed treatment and re use of produced water from fracking

Follow Up Flag: Follow up
Flag Status: Flagged

I support The Red Nation's contention that the treatment of produced water from fracking operations can not be cleaned of it's pollutants sufficiently to re introduce it to the water system, either above ground or injected back into an aquifer. I strongly urge you to consider the preservation of our water supply in this very arid state, the safety of that supply and the long term consequences of polluting it, both above and below ground. We will pay a heavy price for that. In addition, Native American rights and soverinty shuold be respected.

Sincerely,

David Patton
Angel Fire, NM

From: Therese Patton [redacted]
Sent: Friday, November 16, 2018 12:28 PM
To: water, renewable, EMNRD
Subject: Produced water

Follow Up Flag: Follow up
Flag Status: Flagged

It doesn't take a grade school education to understand that poisoning clean water for a corporate entity's greedy agenda, and then letting that same entity give us dirty water in return will not benefit life on earth. Research shows that the chemical poisoning of this life giving water cannot be cleaned up and made safe for human consumption.
There is a finite supply of clean water on earth and water wars have already begun. Governments that put all their support toward corporate interests resemble oligarchies, corporatism, or fascism, but not democracy. We the people demand attention to our most basic needs, clean food, clean air and clean water. Without these things we cannot hope to achieve anything else that gives us a future.
It's time for more money and regulations to go toward renewable energy and clean energy options. The dark ages of fossil fuels is killing us. Including the "deciders". NM is facing a drought, has always had a shortage of reliable water that it has to share with other states, and has many other water needs, not just human consumption. Agriculture, recreation, fire danger, population growth and other industries. Fracking is not the biggest and best idea for NM. Carlsbad is ruined. Fine. Keep the damage there. Show some wisdom for the rest of the state.
Therese Patton
Angel Fire, NM

From: David Robertson [redacted]
Sent: Friday, November 16, 2018 10:15 AM
To: water, renewable, EMNRD
Subject: Fracking

Follow Up Flag: Follow up
Flag Status: Flagged

We do not want fracking wastewater in our drinking water! The solution is to stop fracking, not to feed us this bad water.

Sent from my iPhone

From: Zigich, Daren, EMNRD
Sent: Monday, November 19, 2018 6:00 PM
To: water, renewable, EMNRD
Subject: Comments to Produced water draft white paper, November 9, 2018

Please accept the following comments to the produced water draft white paper dated November 9, 2018.

Middle of Page 6 - *"In addition to regulating E&P activities, the OCD administers and enforces regulations pertaining to natural gas processing plants, geothermal installations, carbon dioxide facilities,…"*
Unfortunately, for me, Geothermal installations are no longer regulated by OCD

Text call-out box on Page 6 – *"One cannot obtain a water right for the disposition or use of produced water in New Mexico."*
This phrasing makes it sound like a bad thing. Should read "one does not need to obtain a water right…"

Page 7, first line – adjust language to reflect any change to text call-out box on page 6.

Page 8, Groundwater Protection, first paragraph – delete "geothermal installations"

Page 13 and 14 – The paragraphs on each page under the text call-out boxes seem to be repetitive. Also foot note 5 and 6 are identical.

Page 18, first line – *"Some of them may be commodity feedstocks…"*
Change them to these?

Page 18, second to last sentence – *"Generally speaking, the OCD, the NMED and the EPA do not regulate products."*
EPA does regulate chemicals and thus could potentially regulate residual products. This comment applies to all similar sentences on pages 20, 24, 25, 27 and 29

Page 21 – Acronyms TBEL, WQBEL ELG and BPJ are not initially spelled out.

Page 24 – Throughout the paper there is no mention of "custody transfer" which is a well understood concept in Air Quality regulations. This seems like a necessary concept for defining the line between O&G operations and non-O&G operations and thus OCD jurisdiction vs. NMED/EPA jurisdiction. This is very critical if the treatment facility is part of an industrial operation. In that scenario, the industrial operation will be subject to an NPDES permit which could be affected by its use of recycled produced water as its source water. In figure 7, the assumption is that there is not surface discharge and thus no NPDES permit. Somewhere down the line a facility will needs to discharge and effluent that originated from the recycled produced water. I think the discussion on page 26 is apt for page 24 as well.

Page 26, first full sentence and Page 29, last sentence – So even if a "custody transfer" occurs at the treatment facility, all wastes from the treatment facility are still regulated under O&G regulations and OCD? So essentially there is no custody transfer and thus no transfer of liability?

Page 31, Item 3 - this would be a positive for all industry in NM.

Page 31, Item 4 – If any recycled **products or wastes** from produces waters are used outside the O&G industry maybe OCD should not be involved at all. How can OCD regulate the waste but NMED regulate the product? Makes no fundamental sense and will hamper public acceptance.

Page 33, Item 13 – Again a formal "Custody Transfer" will help set the liability line.

Sincerely,

Daren K. Zigich, P.E.
Engineering Technology Program Manager
Energy Conservation and Management Division
NM Energy, Minerals and Natural Resources Department
[redacted]

From: Russell Doss [redacted]
Sent: Monday, November 19, 2018 12:39 PM
To: water, renewable, EMNRD
Subject: NM Produced Water Governance White Paper Comments

Hello,

Thank you for the opportunity to comment on this white paper. I found it to be very detailed, based on sound science, and well written. Many of the concerns I have had during the past three years in working with Produced Water were discussed in this white paper. My comments are listed below:

1. This white paper details the myriad of regulations and permits required for treatment of produced water in a variety of situations. Could a unified NM permit system be established where a single permit could be required for treatment of produced water for renewable "non-oilfield" uses, with a flow chart directing the applicable requirements from each agency for each situation?

2. In paragraph 8 on page 32, it discusses the need for clarification of the responsibility and control of produced water. This is needed. We originally desired clarification that the produced water would be described as a "waste" product that could be treated and be "owned" by the treatment company, who could then "sell" or dispose of the treated water in accordance with all requirements. If the term "control" replaces the term "owned" and allows the treatment company to "sell" or dispose of the treated water in accordance with all requirements, this would be a good clarification. Is the term "control" really meant to be used in this way?

3. This document clarifies that no water right is created at any time through the disposition by use of produced water. However, benefits may be derived to the state of NM if produced water is cleaned to required standards and discharged into a surface water, like the Pecos River and the state receives credit under the Pecos Water Compact for delivery of additional water to Texas. This is a sound idea. In 2002, the NM Legislature passed HB 388 that provided a $1,000/AF tax credit if a produced water treatment company cleaned the produced water to the required standards and discharged it into Pecos River. Could the agencies producing this white paper support a legislative bill to create that program again?

4. Alternatively, there is an idea that the produced water could be cleaned and given to Texas for credit under the Pecos River compact without actually putting it into the river. That could be beneficial on several levels and should be looked into further.

5. Some communities in SENM have water sources that are severely declining or compromised due to use or due to unrestrained pumping from across the Texas State Line (eg. Jal, Hobbs or possibly Clovis/Portales). Some of these communities are located in proximity to produced water sources. If a community enters an agreement with a produced water treatment company and they jointly plan to clean the produced water to the required standards and discharge it into the applicable aquifer, could a path be created whereby the community could have priority in applying for the ground water rights in an equivalent amount to what was discharged into the aquifer?

6. In the same manner, if a community like Carlsbad enters an agreement with a produced water treatment company and they jointly plan to clean the produced water to the required standards and discharge it into Pecos River, could a path be created whereby the community could have priority in applying for the surface water rights in an equivalent amount to what was discharged into the river?

7. For clarification, produced water used for oil field uses may be disposed of in SWD wells with little regulation. If produced water is treated for beneficial use outside of oilfield uses, can the produced water treatment process concentrated residual be disposed of in a SWD well? Or will the residual be required to be tested for hazardous materials and disposed of accordingly?

Thank you for the opportunity to comment on this white paper. I am grateful for the effort put into the creation of this document by all the parties involved and am hopeful that the desired ends described in this white paper can be put in to full effect to make an additional source of water for the state of New Mexico.

Russell Doss, P.E.
Senior Engineer II

Personal Registrations: NM PE 8828
Corporate Registrations: AZ Engineering/Geology/Surveying Firm (14070), SD Surveying Firm (C-7436), TX Engineering Firm (8877), TX Geology Firm (50254), TX PST CAPM (CS-0000051), TX Surveying Firm (10162200), WY Engineering/Surveying Firm (S-1704)

Souder, Miller & Associates
Engineering ♦ Environmental ♦ Surveying
[redacted]

From: [redacted]
Sent: Thursday, November 22, 2018 11:14 AM
To: water, renewable, EMNRD
Subject: Fracking

Follow Up Flag: Follow up
Flag Status: Flagged

Please, no new fracking leases!!! Water is scarce enough and this is just plain wrong! I am in the process of moving to New Mexico for the air and water quality as well as the quality of life, and am very, very concerned about this proposal.

Diane Cotsonas

From: James R Ludden [redacted]
Sent: Sunday, December 02, 2018 1:35 PM
To: water, renewable, EMNRD
Subject: Cancel December Lease Sale 2018 L

Please cancel this lease

- Jim Ludden
observe, analyze, design, create, repair

From: Lydia Davis [redacted]
Sent: Sunday, December 02, 2018 10:24 AM
To: water, renewable, EMNRD
Subject: Cancel December Lease Sale 2018 L

There is enough environmental damage done so do not perpetuate further environmental deterioration in the area.
Please stop the December Lease sale and comply with:

-Full tribal consultation
-Protect Greater Chaco
-Environmental impact assessment needed
-Health Impact Assessment needed
-Halt Holtec International's construction of a nuclear fuel storage facility in an area where there is "increased seismic activity" due to the injection of produced water and fracking.
-No new leases
-No more water for fracking
-No more conflict of interests: Indigenous and other impacted communities (not oil and gas company executives) need to be at the table to rewrite regulations for produced/contaminated water.

Lydia Davis

[redacted]

From: Shyam Dighe [redacted]
Sent: Friday, December 07, 2018 4:11 PM
To: water, renewable, EMNRD
Cc: 'Previs, John'; leejm@aquasourcetechnologies.com; sprevis@mintpartners.com; Tomlanovich, Linda; dighesv@aquasourcetechnologies.com
Subject: Response to Section 4.2(d) of the MOU dated July 16, 2018 between US EPA and The State of New Mexico
Attachments: ATC Letter to U.S. EPA re New Mexico EMNRD 4848-5100-4802 v.3.pdf; PADEP Authorization Letter.pdf; ATC System Schematic Diagram.pdf

Dear Sir/Madam:

This attached submission is in response to the solicitation of comments with respect to the subject MOU and related white paper. It will provide information regarding an available resource "to provide safe water to water-scarce communities in New Mexico."

Let me know if you need additional clarification.

Best regards,

Shyam

Dr. S. V. Dighe, P. E.
President & CEO
AquaSource
TEC-INOLOGIES CORPORAT ON
[redacted]

AquaSource
TECHNOLOGIES CORPORATION
We Clean and Commercialize Water

December 7, 2018

VIA EMAIL (renewablewater@state.nm.us)

U.S. Environmental Protection Agency
New Mexico Energy, Minerals and
Natural Resources Department (the "EMNRD")

Re: Memorandum of Understanding between The State of New Mexico and the EPA dated July 16, 2018 (the "MOU")

Ladies and Gentlemen:

This submission is in response to the solicitation of comments with respect to the MOU and related white paper. Terms used in this submission without definition have the meanings given them in the MOU.

This submission will provide information regarding an available resource "to provide safe water to water-scarce communities in New Mexico."

Specifically, this submission responds to Section 4.2(d) of the MOU. ATC would like to identity a process that will treat produced water and result in commercially saleable by-products (i.e., distilled water and chlor-alkali quality salt) without any residue to be disposed of in a UIC injection well. Thus, the ATC system creates usable by-products without the adverse environmental impact of disposal in a UIC injection well.

ATC uses plasma technology to treat produced water that is first converted into re-use water with minimal treatment and then through the ATC treatment system becomes renewable water. The renewable water is of a quality that it can be discharged under an NPDES permit.

ATC has had a pilot plant in operation since April 2017. The pilot plant is located at the water treatment facility of RES Environmental Services located in Mt. Pleasant, Pennsylvania.

RES receives the produced water and treats it through its customary treatment process to create reuse water. But, instead of returning the reuse water to the field, RES delivers the reuse water to ATC for final treatment to create renewable water and chlor-alkali quality salt.

In the Marcellus and Utica shale regions, water is plentiful and not a scarce commodity. For this reason, ATC's efforts to date have focused on creating a salt product that can be classified as a "commercial equivalent" to salt products being sold in commerce.

1119 Old U.S. Route 119 South, Mt. Pleasant, PA 15666 Tel: (724) 696 4290 [redacted]
Email: dighesv@aquasourcetechnologies.com

AquaSource
TECHNOLOGIES CORPORATION
We Clean and Commercialize Water

Attached is a copy of ATC's co-product determination received from the Pennsylvania Department of Environmental Protection ("**PADEP**"), dated October 26, 2018, which is the form of authorization issued by the PADEP for commercial sale of by-products created from "waste." To our knowledge, this is only the second co-product determination issued by the PADEP.

Although ATC's focus has been on the salt by-product, the water produced by the ATC treatment process is distilled water. The primary objective of the MOU is to identify processes that can "provide safe water to water-scarce communities in New Mexico." The ATC pilot plant has demonstrated this ability.

ATC holds five U.S. patents, four Canadian patents, one Israeli patent and two patents have been cleared for the issuance and validation in three countries in the European Union.

Attached is a schematic diagram outlining the ATC treatment system. As indicated, the ATC treatment system is capable of treating TENORMS and vitrifying them into an inert glass that can then be disposed of in a radioactive landfill. In this process, the volume of material for disposal is reduced by a factor of 10.

We understand that rationale supporting the statements made in Section 3.5 of the MOU. ATC is not seeking any type of endorsement from either the EPA or the EMNRD. Rather, ATC is seeking to bring to your attention a solution for the treatment of produced water that meets the objectives described in the MOU.

ATC is highly confident in its ability to demonstrate a complete solution to the produced water problem. All we ask for is serious consideration of this complete solution and an opportunity to demonstrate that solution to you.

The personnel of ATC are available for further information and questions. Please don't hesitate to contact me at [redacted] or via email at [redacted]

Very truly yours,

Shyam V. Dighe
President and CEO

Attachments – PADEP Authorization Letter
ATC System Schematic Diagram

cc: Jong Lee (Vice President-Special Project)
John R. Previs, Esq. (Buchanan Ingersoll & Rooney PC)

1119 Old U.S. Route 119 South, Mt. Pleasant, PA 15666 Tel: (412) 229-8200 [redacted]
Email: dighesv@aquasourcetechnologies.com

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

October 26, 2018

CERTIFIED MAIL NO. 70031010000310246990

S.V. Dighe, Ph.D.
President and CEO
AquaSource Technologies Corporation
[redacted]

Re: Coproduct Determination per 25 Pa Code §287.8
Sodium Chloride from desalination of oil/gas wastewater by a high temperature plasma process
Mount Pleasant Demonstration Plant

Dear Dr. Dighe:

On July 18, 2018 the Department received the assessment of routes to humans and ecological receptors for barium relevant to your coproduct determination for sodium chloride produced from desalination of oil and gas wastewater by application of a high temperature plasma process originally received by the Department on March 27, 2018. The process yielding the sodium chloride is being carried out at the wastewater treatment facility of Reserved Environmental Services in Mount Pleasant, PA.

Because the coproduct determination is a self-implementing program, this letter is neither a concurrence or non-concurrence, nor is it a waiver of future action by the Department.

Should you move forward with the use of the sodium chloride generated from the process referenced above as a coproduct, you are reminded to maintain documentation that demonstrates continuing compliance with the coproduct determination. In accordance with 25 Pa Code § 287.8(d), those records must be made available to the Department upon request. Further, in accordance with 25 Pa Code § 287.8(e), you are required to provide documentation supporting the coproduct determination to persons selling, transferring, possessing or using the material. Prior to meeting the coproduct requirements in 25 Pa Code § 287.8, the material must be managed as a waste.

If you firmly maintain that a concurrence from the Department must be received, we recommend that you apply for and obtain a general permit for the processing, if needed, and/or beneficial use of the waste material described in your coproduct determination.

If you have any further questions, please do not hesitate to contact me by telephone at: [redacted] or by email at: [redacted]

Sincerely,

Kevin M. Beer, Chief
Compliance and Technical Support Section
Division of Municipal and Residual Waste

From: Mike Hightower [redacted]
Sent: Friday, December 07, 2018 1:26 PM
To: water, renewable, EMNRD
Cc: Debbie Dixon [redacted]; djcunnin; fowliera; mmhightower
Subject: Comments on Draft Produced Water White Paper by NM Desalination Association

On behalf of the New Mexico Desalination Association, a New Mexico 501-C6 corporation, we would like to provide the following comments on the State of New Mexico/EPA Draft White Paper - Oil and Natural Gas Produced Water Governance in the State of New Mexico, dated November 9,2018.

The New Mexico Desalination Association is a non-profit, established to assist the desalination industry in New Mexico and the Southwest by developing professional and stakeholder knowledge of current and emerging desalination approaches, technologies, and applications. Our goal is to unite and educate stakeholders on desalination's potential in New Mexico, and on creating new water supplies through desalination of non-traditional water resources, such as brackish surface and ground water, produced water, and industrial waste water reuse, that will support long-term economic growth, while protecting the environment and maintaining the social and cultural traditions of New Mexico.

We have reviewed the "Draft White Paper' within the context and focus of our mission identified above, and our comments and recommendations are based on trying to improve the overall clarity and usability of the report, and help accelerate produced water reuse, treatment, and recycling to create additional water supplies and associated economic development for New Mexico. The comments are also based on input and discussions at the NM Desal Association sponsored " NM Produced Water Conference" in Santa Fe on November 15-16, 2018.

Our comments are separated into each of the three major goals of the paper. They include:

1. Highlight how to use treated produced water to reduce water scarcity.
    - The figures provided, nicely show and highlight the different opportunities for produced water use, reuse, and recycling
    - All options and possibilities were accurately shown and discussed. This is a very thorough discussion of options.
    - In all discussions, the waste and potential product issues were addressed and discussed along with the treated water issues. This is indeed an import environmental and economic consideration and the fact that the residuals/minerals/products were always addressed provides a very complete picture of the elements to consider in trying to accomplish total reuse.
    - There was no discussion of current costs of disposal of produced water, or what the cost might become in the future as a baseline for looking at the economic viability of produced water recycling and creating new water. Without some cost discussion and potential trends, there will continue to be those that simply state it will be too expensive. Some discussion of current and emerging produced water disposal costs, even if limited, would provide at least a point of discussion of potential economic benefits such as avoided costs, opportunities for new products, etc. For example, produced water disposal at $1/bbl is equivalent to $25/1000 gal. Sea water desal is currently nominally $6-8/1000 gal. So there is a potentially large economic incentive to treat produced water, even if the water is sold at a nominal cost. Without some economic discussion, people can derail this as too expensive, without having to justify it. That is inappropriate!
2. Provide a roadmap for stakeholders in navigating the existing federal and state regulatory landscape.
    - Each narrative does a very good job in discussing each of the potential options, roles of state agencies, regulatory compliance laws, etc.

- It would be nice if each section narrative could include a list or table of bulleted steps, with the associated regulation/permit type and authority. This would provide a good checklist/summary steps for users. This would actually provide a physical flow chart/roadmap for each type of reuse/recycling options.

3. Identify policy gaps and opportunities to streamline existing frameworks.
   - This section provides some ideas of ways to improve communication and work more closely together, nicely done.
   - But the section needs to include the top 4-5 RECOMMENDED changes to accelerate the process. Adding the amount of time saved by making each of the changes would provide future administrations information on where the most appropriate improvements should be made.
   - Would be nice to have an estimate of what the current timeline would be on getting approvals for each approach with the RECOMMENDED improvements. This would be nice to have to show how the streamlining can work for industry, and might set a target timeline that industry could use to assess options.
   - The report should also include the additional manpower NM would need to make the streamlined process work. It is not appropriate to suggest this could be done more quickly, if you do not identify the personnel needed to make the process work smoothly.
   - It is likely that additional staff in OCD, NMED, and OSE will be needed and even additional personnel commitments from EPA needed to make this a reality. Adding the personnel needs shows an understanding of where bottlenecks could occur. Future administrations need to understand this funding requirement.
   - It might be appropriate to estimate how much this additional option oversight might cost and how the funding to support it might be generated. For example, if this would need three additional people and funding of $600K/yr, and the benefit to NM would be $500M/yr in revenue, the program easily pays for itself and actually would be a 'no brainer' for any administration.

Thank you for the chance to comment on this Draft White Paper. We hope these comments are constructive in helping to move NM forward on treatment and reuse of produced water. We applaud this effort, and we are more than happy to help support the effort for the State of New Mexico and EPA as they deem appropriate.

Thanks,
Mike Hightower, Vice President
New Mexico Desalination Association
[redacted]

From: Kenney, James [redacted]
Sent: Monday, December 10, 2018 10:13 AM
To: Kevin Thimmesch
Cc: Dan Ertel; Chris Frantz; Jerel Bogdan; water, renewable, EMNRD; Sayer, Matthias, EMNRD
Subject: RE: Comments to NM Produced Water White Paper

Thank you, Kevin and the rest of the Eureka Resources team for submitting input on New Mexico and EPA's draft white paper on produced water governance in the State of New Mexico. I look forward to reading them in depth and the State/EPA team will follow up if we have any questions.

Thank you,
Jim
--
James C. Kenney | Senior Policy Advisor for Oil and Gas
Office of Congressional and Intergovernmental Relations | Office of the Administrator | U.S. EPA
[redacted]

Please note: I am geographically located in Albuquerque, New Mexico (Mountain Time Zone).

From: Kevin Thimmesch [redacted]
Sent: Sunday, December 9, 2018 5:30 AM
To: Kenney, James [redacted]
Cc: Dan Ertel [redacted]; Chris Frantz [redacted]; Jerel Bogdan [redacted]
Subject: Comments to NM Produced Water White Paper

Good morning Jim,

Below is a list of items identified in the Produced Water White Paper from our collective review.

But first let me congratulate the team on developing such a comprehensive paper. The Eureka team found the paper to be very insightful and factful as it relates to the regulatory parameters and opportunities for the state of New Mexico on the topic of produced water. We couldn't agree more that there is significant potential for the state to provide a new water resource and believe the opportunities for economic growth, environmental stewardship, habitat restoration, agriculture and municipal interests are outstanding.

In the absence of a word document and the ability to track changes we've assembled a list by page/paragraph for consideration by the team. If you have any clarifying questions we gladly make ourselves available.

- In the opening paragraphs, the author says that in 2017 NM had average 11% regions in drought, but in 2018 it jumped to 95%. A short page or two later, the author says in 2018 NM became the 3rd largest oil producer in the U.S. It might be advisable to explicitly state in that section that the relationship between oil production and increasing drought are not causal. A casual reader will certainly connect these two as directly related, even if they are not.

- Page 3 – when introducing the concept of 'produced water' it should be explicitly stated that produced water, entrained with oil production, comes from deep, non-aquifer zones and is a "new" source of water not currently used as a water resource in the state, rather than a pilfering of aquifer water

- Page 12 bullet point number one titled Re-Use water "undergoes minimal" (insert) or no treatment and is used (delete) "again" (insert) for use in hydraulic fracturing in oil or natural gas well (insert) development before disposal in an underground injection well (insert) or treatment.

- Page 12 bullet point number two titled Recycled Water (delete) "significant" and mirror language outlined above in remaining language.

- Page 12 bullet point number three titled Renewable Water, suggest language that this new water could be used for a variety of purposes including oil and gas development, agriculture, habitat restoration, pact compliance, return to hydrological cycle, municipal and/or industrial interests, etc.
-
- Page 12 figure 3 may need modified to reflect the above suggested changes.
-
- A suggestion to consider, in this paper three categories are identified: "re-use water", "recycled water" and "renewable water" (page 12). But then it never uses the term "renewable water" again in the report. Likely because there are NO participants in the market yet with this capability. Perhaps add text that highlights the "potential" treatment capabilities, and refers to this as the highest form of treatment for use – something to strive for, rather than something to marginalize.
-
- Page 12 – Explicitly defines "renewable water" and heavily treated produced water that is re-introduced into the hydrological cycle. This is Eureka's niche; might suggest enhancements to this category later in report
-
- Section 2, pages 12 to 30 – This section, the bulk of the report, finishes by discussing regulatory oversight of "treated water re-use or discharge" and the various non-oil/gas uses such as municipal, industrial and agriculture. It treats reintroduction into the public water system as an oddity: "Adding treated produced water into a public water system for potable uses would fall under the authority of the NMED's Drinking Water Bureau. The treated produced water would need to meet the requirements of the SDWA. The NMED currently does not have specific drinking water regulations that address the use of treated produced water (or reclaimed domestic water) for a potable supply, so such proposed projects would be considered on a case-by-case basis" (page 28). The implication is that treated water isn't good enough for potable uses, and that's why it's rare and doesn't have its own regulations. There is an air of "dirtiness" here that would lead the reader to never wish to drink treated produced water. But that ignores full treatment capabilities/effect. Suggest additional text, be appended to the end of Section 2 that describes the highest level of treatment – production of truly "new water" that meets USEPA standards. Also suggest there is an additional category beyond "treated water" such as … "purified water" for treatment processes that are able to treat to a level of the USEPA secondary drinking water standards.

- Page 13 paragraph 3-5 under the title Recycling, Re-use and Treatment. Suggested change of text, thinking that OCD would prefer "treatment" for a new water source and would incent treatment for a new water source capable of entering the hydrological cycle.

- Page 14 paragraph one perhaps more of a question in the statement "However, the re-use of produced water is NOT permitted for any use which involves contact with fresh water zones." How then does the treatment option work?

- Page 14 paragraph 3 a question on the term "universe of facilities", unclear as to the meaning of this terminology.

- Page 15 paragraph 2 bullet points 1 and 2, The definitions do not seem consistent with the rest of the document. Under the treatment definition suggest changing to read "Conditioning of produced water to a state and form capable of entering the hydrological cycle and may include physical chemical and mechanical processes". Under the recycling facility definition the definition concludes with "…." Unclear on this ending.

- Throughout the document consider changing “Renewable” to New. Produced water is indeed a new source of water that when treated can become a resource to the state. This water source is currently not appropriated and is therefore not a current supply rather if treated becomes a new source of water for the state.

- Bottom of page 17 – It might be outside of the scope and purpose of this document, but small emphasis was placed on the “products”, and their potential economic impact. We’d suggest at least add a few more lines here describing the various salts (NaCl, CaCl2, LiCl, etc), even if content is aimed at the regulatory impact side of those specific products – what kinds of permits and approvals might be needed for those facilities (air, water, waste), building permits, permits for co-located industries that might be attracted to the area, etc. This might be a way of keeping to the theme of this being a regulatory summary document, but also getting readers excited about the prospect of these spin-off impacts that most may not even be visualizing at present and the associated economic development opportunities.

- Page 19 starts off with “Current”, as this effort is for the future state perhaps emphasis on Opportunity should be explored in this section.

- Page 20 in the discussion section paragraph 2 suggest changing “residuals” to “Co-products or Minerals”.

- Page 23 – It would be useful to have a bit more info inserted about the environmental review-related requirements associated with getting a NPDES permit, directly in this document. These can be HUGE efforts that have the potential to be roadblocks to getting a NPDES permit, so more color is needed here. Perhaps a few bullets of what is typically include in NEPA review doc, an endangered species review, etc. These reviews might end up being the primary battle grounds where opposition to these kinds of operations will choose to attack.

- Page 24 in the discussion section suggest changing “residual” to “Co-Products or Minerals”.

- Section 3, starting on page 31 – Could be the single-most important section of this doc, because this is the one place where ideas for streamlining things is included, as opposed to presenting a summary of current regulatory frameworks. A potential addition here would be to somehow include a discussion about the idea and/or some sort of progress update communication re: introducing incentives to operators and service companies to move towards “new water” options vs. reuse and/or SWD disposal. Perhaps also a separate bullet for some sort of regular roundtable/communication function for dispersing updates to stakeholders specifically re: the Best Available Technology available for treatment/advanced treatment/co-product development. Perhaps an annual technology showcase to be held in the state? Perhaps the biggest source of stakeholder fear is not knowing what level and type of advanced technology is available and proven that can address some of the biggest fears that exist out there. The fraction of stakeholders (and hell, even producers) that know what advanced technology can accomplish is lower than we all might think. That gap needs to be filled with more outreach and communication. Another idea for this list is some organized means to evaluate and disseminate the potential economic impacts of the various options: negative impacts of GW usage and/or contamination impacts, overpressurization, positive impacts of attracting co-product related co-locations, etc. An economic impact forum is potential option here. In summary, Technology and Economic forums are monumental gaps that need to be called out specifically.

- The word “potable” used throughout the document maybe a word or term requiring additional clarification and thought in this paper and future NM regulation.

Thank you again for the opportunity to review this document, we truly appreciate the ability to be a part of this process and again offer and welcome any additional assistance the team my require.

Best Regards,

Kevin Thimmesch
Chief Operating Officer
Eureka Resources, LLC
[redacted]

From: Rebecca Oster [redacted]
Sent: Monday, December 10, 2018 10:37 AM
To: water, renewable, EMNRD
Subject: Recycled Fracking Waste Water New Mexico

NOOOO!!!!!!!

From: Sayer, Matthias, EMNRD
Sent: Monday, December 10, 2018 11:33 AM
To: water, renewable, EMNRD
Subject: FW: Wastewater Upgrading

Matthias Sayer
Deputy Cabinet Secretary
New Mexico Energy Minerals & Natural Resource Department
[redacted]

From: McQueen, Ken, EMNRD [redacted]
Sent: Monday, December 10, 2018 9:20 AM
To: [redacted] SullivanGraham, Jeri, EMNRD [redacted]
Cc: Sayer, Matthias, EMNRD [redacted]
Subject: FW: Wastewater Upgrading

FYI

From: Jared Lazerson [redacted]
Sent: Sunday, December 9, 2018 11:44 AM
To: McQueen, Ken, EMNRD [redacted]
Subject: [EXT] Wastewater Upgrading

Mr. Secretary,
We can provide a scalable modular solution that will alllow you to reach your wastewater upgrading goals at relatively low capital cost and depending on the end desired quality, moderate operating cost as compared with current equivalent methods such as mechanical evaporation. Our advanced filtration technology is currently being deployed in the Alberta oilsands to facilities with much more severe water quality issues then basic frac or production water. We would be very interested in coordinating with your office and local service companies to deploy our containerized systems for wastewater upgrading for reuse and repurpose. Our technology is at the absolute forefront of oil and gas wastewater treatment and there is nothing similiar commercially available.

Thank you,
Jared Lazerson
CEO

From: Trais Kliphuis [redacted]
Sent: Monday, December 10, 2018 11:40 AM
To: water, renewable, EMNRD
Cc: Trais Kliphuis; Sayer, Matthias, EMNRD; [redacted]; Ryan Flynn
Subject: NMOGA Comments on EPA/NM Draft White Paper
Attachments: NMOGA Comments NM EPA PW White Paper Final 12102018.pdf

Please see the attached comments from the New Mexico Oil and Gas Association regarding the draft white paper on Oil and Natural Gas Produced Water Governance in the State of New Mexico.

Please confirm receipt and let me know if you have any questions or concerns.

Trais Kliphuis
Director of Regulatory Affairs

NMOGA
NEW MEXICO OIL AND GAS ASSOCIATION
[redacted]

NEW MEXICO OIL AND GAS ASSOCIATION

December 10, 2018

Filed Via Email

Ken McQueen
Cabinet Secretary
New Mexico Energy, Minerals and Natural Resources Department
1220 South Saint Francis Drove
Santa Fe, NM 87505

Re: **Comments by the New Mexico Oil and Gas Association on the Oil and Natural Gas Produced Water Governance in the State of New Mexico - Draft White Paper**

Secretary McQueen:

On behalf of its members, the New Mexico Oil and Gas Association (NMOGA) timely submits the following comments in response to Oil and Natural Gas Produced Water Governance in the State of New Mexico - Draft White Paper (Draft). NMOGA appreciates this opportunity to comment and respectfully requests the New Mexico Oil Conservation Division (NMOCD) take the following comments into consideration.

Background Regarding NMOGA, Its Members, and the Use of Produced Water

Founded in 1929, NMOGA represents over 1,000 members who account for 95% of the oil and gas activity in New Mexico. NMOGA's diverse membership represents every aspect of the oil and gas industry in New Mexico, including exploration and production companies, refineries/processors, pipeline transporters, on-site field service companies, suppliers, and vendors. NMOGA is dedicated to promoting the safe and responsible development of oil and gas resources in New Mexico through advocacy, collaboration, and education.

NMOGA has a long history of working with the New Mexico state agencies in a cooperative manner to ensure oil and gas is developed in a way that protects the environment and special resources. Oil and natural gas producers in New Mexico have been responsibly reusing produced water within their operations for many decades while also utilizing and researching produced water management alternatives.

Decisions regarding policy and regulatory changes affect our members and the New Mexico economy profoundly. Last year, oil and gas companies invested more than $13 billion into the state producing nearly 200 million barrels of oil, a significant increase over 2016. This record production is attributed to improving technologies and has pushed New Mexico to become the third largest producer of oil in the United States. This production has resulted in significant revenue for both the state and local communities.

Comments

The Draft accurately states, advances in water treatment technology have shown promise in turning this waste water (i.e., produced water) into a future water resource. It also acknowledges that there remain many obstacles (e.g., costs) to using treated produced water for applications outside the oil and natural gas industry such as agricultural use. Oil and natural gas producers are actively researching cost effective methods and technology related to its water needs, reuse, and overall management. While the regulatory agencies have an obligation to work with all stakeholders to address the economic, legal and regulatory hurdles; once a clear regulatory barrier has been identified they should focus their efforts efficiently to address the barrier.

The Draft clearly lays out the existing regulatory framework. However, on page 21, NMOGA recommends the following edits in Table 1 and the first bullet after Table 1:

- The revision to the TBELs column in the first row of Table 1 should be as follows, or something similar: *"No direct discharge of pollutants to surface waters, and no indirect discharge from unconventional oil and gas operations to surface waters via POTWs" and,*

- *"The first ELG, 40 CFR part 435, subpart C, bans the direct discharge of oil and natural gas pollutants to surface water. Oil and natural gas operators typically meet this "zero-discharge requirement" by managing produced water through the use of UIC wells, re-use or recycling within the oilfield, or sending the produced water to privately owned treatment facilities known as CWT facilities (discussed below). Subpart C also bans the discharge of*

wastewater from unconventional oil and gas operations into publicly owned treatment works (POTWs) for indirect discharge to surface water, but the discharge of wastewater from conventional oil and gas operations into POTWs is not prohibited and is an option available for permitting authorities to consider."

NMOGA has a significant amount of additional comments worthy of further discussion and requests the opportunity to work with the US EPA and the New Mexico state agencies as this produced water study proceeds and encourages the use of NMOGA producer's expertise and research as it explores other methods of produced water reuse.

Conclusion

NMOGA appreciates the opportunity to submit comments on the Draft and looks forward to continuing to work cooperatively with NMOCD to develop a final document that accurately documents the current and potential regulatory restrictions, concerns and advances regarding use of produced water. NMOGA understands that NMOCD worked diligently and collaboratively with other state agencies to produce a technically sound Draft that provides identification of roadblocks to expanded use of produced water. NMOGA greatly appreciates this effort and would like to collaborate moving forward.

Sincerely,

Ryan Flynn
Executive Director, NMOGA

From: carolyn riege [redacted]
Sent: Monday, December 10, 2018 11:49 AM
To: water, renewable, EMNRD
Subject: Fracking Wastewater Proposal

Dear NM Energy, Mineral, and Natural Resources Dept., Dec. 10, 2018

My husband and I are residents of the town of El Rito, NM in Rio Arriba County.

We are part of the northern New Mexico group who sent roughly 10,000 letters protesting more BLM fracking land lease sales in the Greater Chaco Region (affecting our area the Rio Chama Watershed) which was slated for this past week. You no doubt know of the 40,000 fracking leases between our area and the San Juan Basin in Colorado already. We wrote your offices to state our opposition to the Double Drilling your offices granted the Hilcorp oil and gas company just a few weeks ago.

We are back again to let you know, we STRONGLY protest and will fight every step of the way with the ridiculous notion that Fracking wastewater can be "recycled, reclaimed" or whatever industry speak you choose to use, for agricultural or municipal uses in the state of New Mexico.

The entire notion that WE, the people of NM would happily drink or use fracking wastewater sounds like something out of a science fiction movie. Or that farmers would willingly put such water upon crops or water their livestock. What strange universe do some members of NM state departments and the EPA live in? One where humans can ingest chemicals happily and live long and happy lives?

We challenge you to PROVE TO US YOU CAN CLEAN 100% of the chemical cocktails out of the water used during the fracking process! The reality is you CAN'T but will come up with some "acceptable" standard with which to poison our municipal water supplies. The zippy little charts in the White Paper (pages 24+) showing containers and filters and trucks and other drawings which suggest wastewater be reused for municipal and agriculture reuse are ridiculous.

We know you are pandering to the oil and gas industry which clearly runs this state and your department, to make them less of "the bad guys" for WASTING more than 36 BILLION gallons of our precious desert water in just ONE YEAR in the Permian Basin alone. We're sick and tired of fighting every single step of the way with state and federal offices whose JOBS are to protect and work FOR the health of citizens of our state and country.

How about we test the notion of drinking "cleaned" fracking wastewater upon your families? How about we water your gardens with such waters, or feed it to your pets? We can use YOUR families as test cases for New Mexico. Sound like a plan? Of course not. Because the entire notion is insane.

Regarding the "white paper" which explores this entire notion.

Might I remind you that this past August, representatives from more than 15 environmental and community groups signed onto a letter to the EPA, saying the agreement between the federal agency (the EPA) and the state (NM) violated the Federal Advisory Committee Act (FACA), which sets the rules for establishing advisory committees.

To quote an article from NM Political Reports. "Jeremy Nichols, climate and energy program director with WildEarth Guardians, which initiated the letter to EPA, criticized the paper.

"It was prepared with no public input, and it's based on the make-believe notion that the oil and gas industry's wastewater could somehow be put back into our water systems, including our agricultural and drinking water systems," he said. "While it acknowledges the enormous and dangerous uncertainties associated with reuse of wastewater, including immense public health and environmental risks, the report continues to advance the myth that it may be possible for toxic fracking waste to be used for drinking water, farming or sustaining New Mexico's fragile aquatic ecosystems."

I could quote other sources such as – " …a 2015 Duke University professor found that even treated wastewater from the oil and gas industry had up to 50 times the amount of ammonium allowed by the EPA." *(source: Rebecca Beitch, staff writer, PEW Stateline – original content, Steve Gonzales, Houston Chronical via the Associated Press).*

The net net is that our water and land are being exploited for profit and the oil and gas corporations are given carte blanche by your offices to do whatever they like, whenever they want. Over 70 modifications to regulations have been granted by your offices to Hilcorp ALONE? They are known bad players nationwide in the oil and gas industry whose motto is "acquire and exploit". We know they have you in their pocket, we watched the public Double Drilling hearing and listened to their attorney and watched your committee respond.

We are fighting, writing, calling and demanding to be heard every week, every month, every day it seems – and we are TIRED. Stop this insane idea. Just. Stop. All of it.

Perhaps I have been less than neutral and kind with the tone of my letter, but I am an EXHAUSTED citizen of New Mexico who simply wants safe, clean water for our children and all citizens of our state.

Sincerely,

Carolyn Riege.

Resident of El Rito and Business Owner

From: Nichole Saunders [redacted]
Sent: Monday, December 10, 2018 12:01 PM
To: water, renewable, EMNRD
Cc: Scott Anderson; Colin Leyden
Subject: EDF Comments - Draft EPA/NM White Paper on Produced Water
Attachments: EDF NM EPA PW White Paper Comments_12.10.18.pdf

Please accept the attached comments from EDF on the draft white paper regarding "Oil and Natural Gas Produced Water Governance in the State of New Mexico."

Respectfully submitted,
Nichole Saunders

Nichole Saunders
Attorney
Energy Program

Environmental Defense Fund
[redacted]

December 10, 2018

Energy, Mineral, and Natural Resources Dept.
c/o OFS/MOU
1220 S St. Francis Drive
Santa Fe, NM 87501

via email: renewablewater@state.nm.us

Re: Oil and Natural Gas Produced Water Governance in the State of New Mexico – Draft White Paper

Environmental Defense Fund (EDF) appreciates this opportunity to submit comments on the Draft White Paper developed by EPA Region VI and the State of New Mexico regarding oil and natural gas produced water governance. EDF is an international environmental organization with over 2,000,000 members and activists worldwide including over 22,000 New Mexicans, many of whom are deeply concerned about the impacts of oil and gas development on human health and the environment, including water resources. EDF has a depth of expertise on the issues analyzed in this white paper, particularly with respect to the characterization, treatment, and assessment of health and toxicological risks related to produced water and its reuse or discharge. We look forward to ongoing engagement with EPA and New Mexico towards ensuring that any new produced water management strategies that may be pursued are done so in a way that first and foremost prioritize the protection of both human health and existing ecosystem, wildlife, land, and water resources.

EDF believes that the first draft of this joint white paper requires additional effort if it is to provide substantive answers on a protective path forward for produced water management and regulation. A majority of the theorized scenarios for reuse or discharge in this document would demand more advanced economic and scientific investigation in order to support appropriately informed, risk-based decision making on implementing policies. EDF believes that this white paper is a useful outline of the current regulatory landscape for produced water in New Mexico for some key agencies involved, and could serve as an interesting and informative conversation starter for potential future reuse options. However, it is clear from this draft, and numerous other similar state and federal efforts, that the data and information available to New Mexico and EPA today are not yet adequate to support and appropriately inform policy making on reuse and release scenarios outside the oilfield in the near-term.

With this in mind, EDF offers the following comments on the white paper and its implications.

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Suite 1300
Austin, TX 78701

T 512 478 5161
F 512 478 8140
edf.org

New York, NY / Austin, TX / Bentonville, AR / Boston, MA / Boulder, CO / Raleigh, NC
Sacramento, CA / San Francisco, CA / Washington, DC / Beijing, China / La Paz, Mexico

Part I: Overarching Recommendations

A. **New leadership review:** Finalization of this white paper should not proceed without review and consideration by New Mexico's newly elected administration officials. It makes practical sense that the individuals that will be tasked with decision-making and any potential implementation of concepts discussed in the paper have an opportunity to weigh in before a final paper is released.

B. **Prioritization of oilfield reuse:** It is clear that the low hanging fruit in terms of water conservation opportunity comes from reuse of produced water in oil and gas operations (other states, like Oklahoma, have reached similar conclusions).[1] The knowledge and regulatory structures to support broader reuse and recycling of produced water within the oilfield are well within reach and deserve prioritization over other scenarios that come with greater health and environmental exposure potential. A final draft should more realistically distinguish between this near-term opportunity and other options that demand more extensive investigation before implementation. Given the limited resources available to New Mexico agencies, concentrating on a known, discrete opportunity makes sense today.

C. **More transparency with respect to regulatory challenges and data limitations:** The draft white paper downplays both scientific and regulatory challenges that would be associated with decision-making and permitting for reuse and release of produced water outside of oilfield operations. While EDF understands the need to develop manageable text, this document should be careful not to create a false impression with public or other stakeholders by glossing over significant obstacles in exchange for simplicity.

   Some examples include:

   a. *Generic references to "permits," "reviews," "approval," "guidelines," and "principles" as regulatory components designed to reduce environmental and health risks.* Noting that these processes are in place without further explanation of the time, data, effort, and information involved can imply that these are quick and simple processes – they are not. This draft makes clear that New Mexico agencies do not yet have produced water-specific programs in place, and developing the appropriate programs, guidelines, permitting schemes, and standards demands time and data. Such challenges cannot be glossed over. Two illustrative examples:
      i. The discussion on discharges references consultation with NMED and "antidegradation reviews." How would an antidegradation assessment proceed without adequate knowledge regarding produced water constituents of concern, background characterization of those

[1] Oklahoma Produced Water Working Group Study (2017).

constituents in the water, necessary analytical methods, or appropriate water quality or other standards for assessment and comparison?

ii. In Section One, the draft notes in passing that "the bureau's approval would be required for any use of treated produced water as a drinking water source by a public water system." This is a seemingly obvious statement that provides little information as to the actual safety and feasibility of produced water as a drinking water source. What would go into an "approval" process? Are the standards or programs in place to ensure the approval process is informed and appropriately tied to the characteristics of produced water?

b. *Quality and approval requirements for numerous reuse scenarios are vaguely deferred to other governing bodies or guidelines beyond those included in the MOU*. This limitation should be well represented in defining the scope and applicability of this project. "Produced water governance in the State of New Mexico" will involve jurisdiction beyond the agencies included and demand consideration of implications beyond the water cycle such as soil, livestock, food safety, infrastructure, etc. These additional jurisdictional bodies will need to weigh in on numerous considerations, including the development or modification of applicable standards or guidelines ranging from drinking water to irrigation standards.

c. *The need for advancements in chemical and toxicological characterization and risk assessment should be better prioritized – otherwise scenarios represented are misleading as to their feasibility*. While scientific questions about human health and environmental implications are recognized in the draft, these challenges are not appropriately associated and incorporated into the discussion of regulatory processes and opportunities for the future. Furthermore, recommendations to seek delegation, provide incentives, or reduce regulatory burdens for approval should not be separated from these scientific limitations.

In summary – while EPA and New Mexico make clear they are "interested in encouraging greater scientific understanding" in the last pages of this draft, the implications of this acknowledged lack of understanding on regulatory programs <u>today</u> are vastly understated. The pursuit of scientific and technological advancements and the development of permitting programs should not be represented as objectives that can be achieved separately and concurrently. One must inform the other. EPA and New Mexico must improve the final document to more substantively recognize that the advancement of programs for produced water use – including the development of new, more appropriate standards and tools (for water quality, irrigation, municipal use, etc.) – is likely to demand data, resources, staff, investment, and time. Recommendations by this white paper to seek delegation, develop "permit-by-rule" programs, create incentives for use outside the oilfield must recognize a first step requirement to better understand produced water itself and any risks from new practices that must be addressed. Otherwise, this entire effort is putting the cart before the horse.

D. Care to avoid giving the public false impressions regarding the opportunity: Building on the above point regarding transparency in the challenge ahead, the final

version of this document should endeavor to be more direct and realistic regarding the opportunity presented by produced water and the realities of its reuse. Two key examples:

a. *Use of the term "renewable water" is inaccurate, misleading, and unnecessary.*
    i. Inaccurate: From a basic definitional sense, produced water is a deep groundwater with a negligible rate of recharge, produced only as a by-product of the extraction of a non-renewable energy source. The treatment or desalination and reuse of saline or industrial wastewaters like produced water may qualify as a non-conventional source of water, but that does not make them 'renewable.' We could find no reputable resources, including those on similar subjects such as wastewater treatment and reuse, which would apply the term "renewable water" to this context – even where the reuse of wastewater is being actively encouraged. In fact, nearly every document we reviewed explicitly defined groundwater as a non-renewable, and non-sustainable water resource.[2]
    ii. Misleading: The creation of this term, previously unused in any other dialogue on this subject, provides more in the way of marketing than substance. Applying a new label such as this presupposes or implies that the appropriate standards for protective reuse both exist and are met. There is no fault in representing the potential positive outcomes and water quantity gains from reusing produced water, but the terminology and conversation around this process must be accurate and transparent.
    iii. Unnecessary: Many other wastewater reuse initiatives, even potable municipal wastewater reuse, have proceeded in practice without being defined as "renewable." The dialogue for many years around produced water reuse, recycle and discharge itself has taken shape without the use of this term. In fact, in this draft white paper, the term "renewable water" is put to use only where it is defined, where it is mentioned alongside reuse and recycle as a list, or as a subheading – *not* in applied discussion or analysis. The simple explanation for this is that the term is unnecessary, and not of common usage by existing stakeholders engaged in this work that predominantly use the terms reuse, recycle, and discharge. EDF sees no need for additional terminology.

b. *Produced water as a presumptive solution to New Mexico's drought should be anchored in fact rather than wishful thinking*. The draft paper establishes a strong presumption for the reader that produced water presents a significant solution to New Mexico's drought. This presumption is valid only if produced water can meet quantity, quality, reliability, and long-term sustainability requirements for water users in the state. For many produced water reuse scenarios hypothesized this is yet to be seen or realized in fact, and this paper should more transparently recognize for the citizens of New Mexico the actual role produced water may play in the state's future. The State of New Mexico uses about 3.4 trillion gallons of water a day, with about 75% of that total going to

[2] *See, e.g.*, Food and Agriculture Organization (FAO) of the United Nations, Review of World Water Resources by Country (2003); The United Nations World Water Development Report 2017: Wastewater – The Untapped Resource (2017).

agricultural use. Operators in New Mexico produced a total of less than 40 billion gallons of produced water last year, and it is unrealistic to presume that all of this water would be available for reuse and even further that it will meet quality and quantity demands in the long-term without potential risk to the end user of a change in circumstance. While there may be real opportunity for produced water to contribute to drought solutions, that opportunity should be realistically presented to the reader.

Part II: Specific Comments and Questions by Section

EDF has a number of additional, more detailed comments on the various sections of the white paper as well as a number of questions on areas where further clarification may be necessary. Those comments and questions are included here as bulleted points, organized by section.

Section One

- State Land Office: The State Land Office is likely to play a significant role in determining the feasibility and implementation of any produced water reuse scenario. Future drafts should incorporate the SLO's role in more than a footnote.
- Water Rights: This report makes clear very early that the state engineer has concluded "one cannot obtain a water right for the disposition or use of produced water in New Mexico." For example, on page 8: "no water right is acquired through the disposition by use of produced water at any time, regardless of the type of use or whether the produced water is treated." However, later in the document there are numerous references to water rights associated with produced water, seemingly presenting a conflict absent clarifying discussion. Water rights considerations should be better summarized and clarified. If fully clarity on this issue is not currently possible, or too complex for the scope of this white paper, its importance and intricacy should be acknowledged as an area for further work.
- Groundwater Discharges: The references to groundwater discharge permits required for land application should be further explained and clarified with respect to their utility and usefulness in reducing risk associated with produced water reuse, particularly in an agricultural context. It should be made clear whether the state: (1) believes the existing process is adequate for produced water/wastewater as a land application, and (2) has enough data to describe the quality of the water used as required by the permit. Furthermore, these permits only address groundwater and are only intended to protect groundwater, not soil, worker or food safety, crop health, etc. This limitation, its implications for knowledge of risk to human health and the environment, and the need for more robust standards should be made clear.

Section Two

- See Section I.D.a above for EDF comments on use of the term "renewable water."
- Solids and Landfills: a broader discussion is necessary.
    - An assumption is made in this draft that treatment will "likely" result in commodity products for sale in interstate commerce. However, there is no

indication that there are standards or regulations regarding the quality control and use of these products in New Mexico beyond the MOU agencies (which "do not regulate products"). This should be addressed.
    - Landfills play a major role in all of the figures, but the regulatory considerations for landfills are not fully addressed. Other states have estimated that the salt from produced water treatment alone would present a significant landfill infrastructure challenge. Not all solids will be saleable products, in fact some concentrated residual wastes and solids may pose contamination risks. Management of treatment wastes should be more substantively addressed.
- Infrastructure: Transportation is addressed briefly, but broader infrastructure considerations for the implementation of various reuse, recycling, and discharge scenarios should be acknowledged in more depth as they are a potentially significant component of decision making. Moving water from the producer to an eventual end-user can be costly, can create a risk for release, and call for approvals or permits from other agencies.
- Surface discharges
    - See discussion above regarding categorization as "renewable water." Industrial wastewater discharges are not typically given special classification as 'renewable.'
    - See discussion above regarding water rights. The indication that discharged produced waters require a permit from OSE to appropriate or divert could be interpreted to conflict with the earlier statement that treated produced waters cannot be appropriated for a right.
    - Table 1: the CBM subcategory is [Reserved] and should either be clarified or removed this chart.
    - 98th meridian standard: This document needs to make clear that the "good enough quality" standard is not defined. While the discussion recognizes that the standard is unlikely to be met without treatment, it does not make clear how the appropriate New Mexico agencies (or EPA) will define the standard itself. What agency will be charged with defining this standard, what considerations will be incorporated into permits, and which agency will determine whether discharges are actually put to ag or wildlife uses?
    - Limitations on characterization, analytical methods, and applicable standards: This section includes a discussion of the basic process for establishing discharge permit requirements, but does not address the scenario where chemicals of concern in produced water do not have applicable water quality standards, analytical methods, or other standards. This document should address the implications of these limitations, and describe how those standards will be written, how long standard development takes, how new methods are developed, etc. This would better represent for the reader the challenge that may be faced in developing protective discharge programs that are appropriate for produced water discharges in the state.
- Industrial Use/Commercial Sales
    - Figure 7: what agency is charged with regulating the pipelines and trucks that leave treatment facilities to transport treated produced water for uses outside of the oil and gas industry?

- Treatment and quality goals: this document vaguely indicates that "the quality of the effluent is likely dictated by the industrial/commercial user specifications and possibly other government agencies." Quality control and risk reduction should be primary considerations in determining the feasibility and appropriateness of a use of treated produced water in another industrial sector. The steps necessary and/or challenges associated with this objective should be further explored in the final draft. There are a number of regulatory considerations that are missed – for example, if the second industrial user has their own NPDES permit for discharge, are there implications given a change in feedstock to their discharge limitations and monitoring requirements? Questions such as these may need to be acknowledged more fully.

- Agricultural Use
  - Quality objectives: As above, this important consideration is vaguely referenced by saying that the agricultural use "quality of water may be dictated by industry standards and/or a federal or state agency other than the EPA or NMED." This does not fully describe the governance structure in a helpful manner.
  - Major gap in soil, crop, livestock, food, and health safety: This document makes clear that the MOU agencies do not have jurisdiction or permitting programs to address human or animal health implications or other agricultural considerations regarding issues such as soil and crop health. There appear to be no standards in place in New Mexico to address these issues, presenting a significant concern as the potential for agricultural use is being touted in this document, in the media, and elsewhere as a significant opportunity for "renewable water" use. The effort to recommend incentives, less burdensome permitting programs, and the like to encourage this use without apparent programs or policies in place to understand and mitigate health and environmental risks is conflicting and raises serious concerns.
- Municipal Use
  - Separating potable vs. non-potable uses. The MOU agencies should consider whether it would be more appropriate to discuss these uses separately given the significant difference in regulatory requirements and health risk.
  - Gap in authority to test for appropriate contaminants with respect to human health risk. This document indicates that the NMED has "no mechanism to require testing for contaminants except as required by regulations." We know for a fact that drinking water standards and regulations are the wrong standards[3] to assess the health risks for consumption of treated produced water. Further, it is clear that in order to make sound, informed decisions on any reuse of produced water outside of the oil and gas industry more research will need to be completed on chemical and toxicological characterization, method development, and regulatory standard development. New Mexico must take seriously the implications of this lack of ability to require assessment and analysis of currently unregulated contaminants of concern. Otherwise a majority of constituents that

[3] Nichole Saunders, *Why drinking water standards are the wrong standards for oil and gas wastewater* (May 29, 2018), http://blogs.edf.org/energyexchange/2018/05/29/why-drinking-water-standards-are-the-wrong-standards-for-oil-and-gas-wastewater/.

may be problematic in produced water, including treated produced water, may go undetected. Voluntary sampling will be necessary but not sufficient to protect human health.

Section Three

- Title and Goals – Putting the Cart before the Horse: The title and introductory text of this section should be clarified. The section is devoted "streamlin[ing]" and "facilitate[ing]" broader produced water management options that "improve the quantity and quality of water in New Mexico." This is adequate language with respect to oilfield recycling, however, there is a serious lack of representation for the scientific unknowns and regulatory limitations for other reuse and release scenarios. First and foremost on the minds of regulators should be an effort to determine the feasibility and safety of any reuse scenario, and this effort should be prioritized over incentivizing, streamlining, and removing industry barriers to new disposal and management options. As mentioned above, a move to incentivize or promote a new produced water management option for which health and environmental risks are poorly understood and the appropriate regulatory programs are not in place puts the cart before the horse. Given the unknowns at hand it is premature to make such policy recommendations, and EDF strongly recommends that the next draft reconsider the way in which these recommendations are framed in relationship to these unknowns. For example:
    - A permit-by-rule scheme for disposition by use outside of oil and gas does not currently appear feasible given knowledge and existing authorities. Implying that such a practice is a potential near-term option is unrealistic. Produced water is highly variable as are the demands and risks associated with a wide variety of potential end-uses outside of the oil and gas industry. A permit-by-rule scheme without further study and understanding would be highly unlikely to address the appropriate variables to reduce risk.
- Clearly distinguish between oilfield reuse and other scenarios. This document misses an opportunity to more clearly distinguish the changes needed to "streamline" and "incentivize" practices that reduce oilfield consumption of fresh water from the research and work needed to consider the feasibility of other potential options.
- Recommendations should address the need to develop new standards and incorporate other jurisdictional roles. Current recommendations for continued collaboration focus only on incentives, not reducing risk. Section Two clearly acknowledges unknowns about soil impacts, livestock considerations, food safety, etc. and also establishes that there is no standard or system in place to address these potential impacts from produced water reuse. Section Two also acknowledges a lack of authority on the part of regulatory agencies to gather data on currently unregulated chemicals. A full assessment of "produced water governance" across the state for the scenarios addressed will demand further analysis, study, and collaborative effort. This section should highlight that need and where appropriate propose mechanisms to address those gaps.
- Better recognize the role data gaps will play in the development of safe regulatory programs. This section acknowledges data limitations, noting that New Mexico and EPA are "interested in encouraging greater scientific understanding of the constituents in produced water, the development of analytical methods, and the treatment effectiveness

for broad groups of chemical compounds found in produced water generated in New Mexico." However, the tone and prioritization of this messaging does not appropriately tie it back to the role these research needs must play in the development of appropriate, protective regulatory programs for reuse or discharge. A mere "interest" in "encouraging" science does not equate with prioritizing human and environmental health in the consideration of produced water management options. EDF hopes that EPA and the State of New Mexico more carefully consider this framing.

- Recognize resource and enforcement realities. Many of the recommendations made here, such as the delegation of NPDES program, development of appropriate expertise, engaging with the public, and creating incentives – alongside those points not made in this section, such as the need for improved water quality and agricultural standards, new regulatory programs and monitoring and enforcement procedures – will all require significant time and resources. As New Mexico makes decisions in the near-term on next steps based on this white paper, the costs to the state to take on new practices while protecting the health of its communities and environments will need to be addressed.

Conclusion

In conclusion, while EDF focused these comments on opportunities for improvement, both EPA and New Mexico should be praised for taking a first step toward better understanding these issues. But, this is only a first step. Managing produced water in a manner that addresses industry realities while also protecting human health and the environment is no easy task and should not be portrayed as such by regulatory leaders. This review presents an opportunity for New Mexico and EPA to contribute to the dialogue occurring at a national level with groups like the Groundwater Protection Council to clearly define the research necessary to answer the questions raised and develop protective produced water governance programs in New Mexico. If a final white paper is to serve as a truly useful tool, it must be more transparent about the task ahead.

EDF looks forward to the opportunity to participate in this process as it moves forward.

Respectfully submitted,

Nichole Saunders
Attorney, Energy Program
Environmental Defense Fund
[redacted]

From: Bill Honker [redacted]
Sent: Monday, December 10, 2018 1:33 PM
To: water, renewable, EMNRD
Cc: [redacted]
Subject: Comments on Oil and Natural Gas Produced Water Governance in the State of New Mexico—Draft White Paper

I offer the following comments on the draft white paper for your consideration:

- p9, third para - the discussion should also mention that EPA issues UIC permits on Indian lands and regulates public water systems on Indian lands
- p11, last para - Add statement that EPA retains responsibility for UIC permitting on Indian lands
- p30, first para - discharge of treated water into groundwater may require a Class I, rather than a Class V, UIC permit. As I recall, the Pueblo of Sandia injects treated municipal wastewater into groundwater occasionally, and EPA may have required a Class I UIC permit for that practice. EPA Region 6 UIC staff should be consulted on this point.
- pp31-33 - the 13 recommendations appear to be appropriate and are well worded. In addition, I suggest a few additional items for consideration:
    - EPA, OCD, NMED, and OSE should designate representatives to serve on a committee to review any proposals that industry representatives are considering for innovative treatment or reuse of produced water. This type of approach has worked well in infrastructure funding to advise applicants on the best combination of funding sources for a particular project, and a similar approach could ensure good coordination between the various regulatory entities to evaluate and respond to produced water proposals.
    - The white paper should identify any current rules which may hamper treatment and reuse (such as 40 CFR part 435, subpart C) and include a recommendation that these rules or guidances be reevaluated.

Please feel free to contact me if you wish clarification on any of these comments. I commend the New Mexico agencies and the EPA for developing the white paper and focusing on this issue.

William K. Honker, P.E.
Former Director, EPA Region 6 Water Division (retired)

[redacted]

From: Beata Tsosie-Pena [redacted]
Sent: Monday, December 10, 2018 2:23 PM
To: water, renewable, EMNRD
Subject: Fracking Wastewater Proposal

To whom it may concern,

I am writing to OPPOSE the Fracking Wastewater Proposal. I cannot express enough my serious concerns that this proposal is even being considered. It is because of the fossil fuel industry and man made impacts that we even have long term drought in our state because of climate change. What water remains in our state must remain pristine and untouched by being contaminated with fracking water. There is no way to clean it completely. Fracking water is a radioactive toxic soup and to try and reuse this water on crops or to reinject it into the aquifer is condemning the people of NM to illness, death, and clean water scarcity for future generations.

As a Tewa tribal member of Santa Clara Pueblo. I know for a fact that there has not been adequate time for public comment, education, government to government consultation, or free, informed and prior consent given by the 19 Sovereign Nations in NM. We share water, land, air, soil, food, and health that are dependent on a clean environment. These elements do not follow political boundaries and we honor the rights of nature and water to flow freely. It is human responsibility to shift the culture of violence that attacks nature on a daily basis. We are not separate from our environment, and indeed, land based peoples are more vulnerable to toxic industry than other demographics because of our close relationship to our lands.

Do not poison the people or water and please oppose this. It is not fair that the people and lands should carry the burden of clean up, proof of harm, or health impacts by the fracking industry. Treated fracking water has no place back into the environment. It should be a closed system that the producers need to find ways to use back in their own endeavors. We are not guinea pigs for the injustice that is fracking violence!

We must protect our reproductive health and justice. The right to raise our families in a clean, safe, healthy environment is at stake. Center Indigenous, pregnant women when considering any proposal that impacts the health of our environment. If she is protected, then everyone is protected. Violence on our lands is violence on our bodies.

I do not consent, my family does not consent, mother earth does not consent. To go forward despite strong opposition is a form of violent assault on those most vulnerable in our state.

Thank you for opposing this extremely offensive proposal. There are ways to deal with water scarcity that uses Indigenous knowledge and expertise and science that are safe and truly renewable. Involve the peoples who are true CAREGIVERS of our sacred place. This proposal is not one of them. We are smarter than this.

Sincerely,
Beata Tsosie

--
Beata Tsosie-Peña
Tewa Women United
Environmental Health and Justice Program Coordinator
[redacted]

From: Lora M. Hein [redacted]
Sent: Monday, December 10, 2018 3:24 PM
To: water, renewable, EMNRD
Subject: Fracking Wastewater Proposal

To Whom it may concern,

As a consumer of agricultural products (also known as vegetables) I would like to register my objections to the premature decision to use treated wastewater from fracking operations for agricultural and municipal purposes.

Considering the recent commercial and health disruption in the national Romaine Lettuce recall, and considering the level of contaminants contained in fracking wastewater that are already known to be detrimental to the health and well-being of humans and other living organisms, I urge the state of New Mexico to consider impacts beyond the state's borders that such a decision might produce.

Thank you,
Lora Hein
Washington State

From: Virginie Pointeau [redacted]
Sent: Monday, December 10, 2018 3:48 PM
To: water, renewable, EMNRD
Subject: Letter from the Western Landowners Alliance
Attachments: 2018.10.18 LTR -VF NM Produced Water Draft White Paper - WLA.pdf

Dear EMNRD,

Please find attached a letter from the Western Landowners Alliance addressed to Secretary McQueen, with comments regarding the Oil and Natural Gas Produced Water Governance of the State of New Mexico -- Draft White Paper.

The Western Landowners Alliance appreciates the opportunity to review and comment on this document.

Sincerely,

Virginie Pointeau

Virginie Pointeau
Communications Director
Western Landowners Alliance
[redacted]

[redacted]
View and share WLA's latest stewardship films!

December 10, 2018

Ken McQueen, Cabinet Secretary
Energy, Mineral, and Natural Resources Dept.
c/o OFS/MOU
1220 S St. Francis Drive
Santa Fe, NM 87501

via email: renewablewater@state.nm.us

Dear Secretary McQueen:

The Western Landowners Alliance (WLA) appreciates the opportunity to review and comment on the Oil and Natural Gas Produced Water Governance in the State of New Mexico – Draft White Paper developed by the State of New Mexico and the U.S. Environmental Protection Agency (EPA). WLA is a landowner-led organization that works to promote connected landscapes, viable lands and native species across New Mexico and the West. Sustainable working landscapes and healthy economies go hand-in-hand. The consideration of how to use and dispose of produced water in areas with oil and gas development is important to landowners. Decisions made related to this topic will impact water supply, water quality, and the ability for landowners to maintain and improve land health and agricultural production for decades. State leadership and continued conversations regarding the treatment, reuse and recycling of produced water is critical for New Mexico's agricultural, environmental and economic future and it may set the stage for similar discussions within other western states that have not addressed this topic.

State and federal partners provided a comprehensive review of regulatory responsibilities and available state options for consideration in the draft white paper. Efforts that continue to build the collaboration between the EPA, New Mexico Oil Conservation Division (NMOCD), the New Mexico Office of the State Engineer (OSE) and the New Mexico Environment Department (NMED) - as well as other state and federal agencies - is critical in yielding the best possible outcomes for New Mexico. We agree that a next logical step is outreach beyond agency personnel to landowners, groups, organizations and citizens throughout New Mexico. The WLA would welcome the opportunity to be an advisor and participant in future collaborative forums. Additionally, our organization can provide stewardship services to lands and landowners impacted by energy development that changes water supply, water quality and ecosystems.

November's produced water forum in Santa Fe clearly highlighted the situation New Mexico now faces in how it will sustain viable agriculture, communities and the oil and gas industry while assuring fresh water supplies for current and future use within the state. New Mexico has the least amount of water (4 million acre-feet) to administer than any other state in the U.S. and

is the 5th driest state in the nation, averaging 14 inches of moisture annually. It takes about 90 acre-feet of water to drill, frack and develop a well today versus the average of 10 acre-feet it took just a decade ago. Changes in fracking and horizontal drilling technologies have created improvements in production capability, a reduction in surface disturbance, increases in oil and gas production costs, disposal, and infrastructure and an increase in the use of fresh water and resulting produced water.

Experts at the forum stated that New Mexico produces about 4.75 barrels of produced water for every barrel of oil. This equates to 120,000 acre-feet of produced water annually which nearly matches the average annual flow of 150,000 acre-feet for the New Mexico portion of the Pecos River. However, New Mexico only treated and reused about 8% of its produced water in 2018.

Recommendations

Fresh Water: Initial regulations and policies should focus on minimizing the use of fresh water for oil and gas operations. Reusing and recycling water within the oil and natural gas industry should be considered a way to assist in these efforts.

Landowners and land managers depend on fresh water for their livelihoods. We are concerned that the current use of fresh water for oil and gas development is not sustainable and will have long lasting consequences for landowners, rural economies and land health. The significant need for water in oil and gas production may force agricultural producers to cease farming and ranching as water rights are purchased and/or moved to other areas for oil and gas production. This is rapidly changing the demography, culture and rural economies of some counties, such as Eddy and Lea counties. If this trend continues, riparian and upland health will degrade and native species tied to these ecosystems may face population declines and potential Endangered Species Act (ESA) petitions and listings. Long-term impacts will be felt as industry eventually cycles out of areas, especially if waters geographically tied to farming have been transferred away from valuable agricultural lands or if wells used for livestock or homes have gone dry. To change this course New Mexico should prioritize moving from the use of fresh water to the reuse of produced water for oil and gas operations.

Technology exists and is being developed to help New Mexico appropriately handle its produced water. These technologies should continue to be developed and explored. As pipelines, treatment facilities, disposal techniques and other technologies are tested and proven, they should be utilized on the landscape. Options for disposing of produced water requires additional research to consider their feasibility and long-term effects on the landscape. This includes the consideration of concentrating waste and water disposal above ground or below ground.

We agree with the assessment in the draft white paper that additional regulations and policies should be explored with stakeholders and policymakers to encourage reuse of produced water and treated produced water, both within the oil and gas industry and within other industries.

Contaminants: Continue to research and identify constituents and the technology to remove those that are considered undesirable. Develop reasonable regulatory standards for use of produced water.

The Permian Basin has multiple formations that are being developed or will be developed in the future. Levels of produced water is significant (at least 4-5 barrels to each barrel of oil). Fortunately, technologies exist and are being developed that enable industry to potentially treat the produced water to a suitable quality for use in reclamation, fire fighting, agriculture, aquifer and river replenishment and even human consumption. However, as landowners and citizens we do not know if current regulations for water quality standards across scales would remove new or unknown constituents brought into the system from formation water or from chemical agents necessary for fracking operations. Treatment facilities would most likely gather produced water from several wells within an area. As a result, this water may have hundreds or thousands of chemicals that may need to be removed or diluted to avoid contamination for a particular use. This would be particularly important for those compounds that biomagnify within the environment.

The draft white paper highlights an ongoing EPA study on produced water. We strongly encourage the state to also make sure these studies and future studies address concerns that may be unique to the Permian Basin.

It is also important to consider the possible impacts of undesired constituents during the treatment process. In a Colorado example, produced water was disposed through evaporation, with misting cannons used to hasten the process. Two unanticipated issues surfaced. Through the misting process toxic chemicals were emitted into the air and carried by wind to local communities and lands outside the treatment facility. The other issue was the presence of biocides in the water that preclude plant growth, which meant the ponds were not able to be reclaimed. As a result, the area generated toxic dust that was carried by wind to offsite locations. These types of residual effects must be researched and considered in policy development and project implementation to assure that treatment techniques do not create unanticipated or residual effects to humans, agriculture and our natural resources.

Surface Use of Treated Produced Water: Develop a process, with regulations, that would allow water treated to an agricultural use level to be piloted and tested on appropriate sites prior to shifting to agricultural use.

Many landowners and agricultural producers recognize the opportunity and benefit of using treated water for livestock, farming and rangeland enhancements. An example of this potential exists in the coalbed methane fields of southeast Colorado. These typically shallow oil and gas wells had higher quality water than what is experienced in the Permian Basin. Even still, the energy developers did a tremendous amount of work with local landowners and agricultural producers to treat the produced water, monitor the quality and pilot it for agricultural surface reuse for nearly 20 years. They conducted testing and monitoring with the EPA and others and demonstrated that, in this scenario, treatment and reuse for agricultural purposes was successful and economical.

Given southeast New Mexico produced water is much different than the example highlighted above, it would be valuable to pilot a low risk study of treatment and reuse of produced water for reclamation purposes to inform citizens of the risks, potential contaminants, ecological impacts and social and financial marketability before applying that water to broader agricultural use.

Ownership and Rights: Ensure that industrial use and commercial sales outside the oil and gas industry benefit the state of New Mexico, its citizens, landowners and agricultural producers and natural resources.

WLA agrees with the authors of the draft white paper that there is a significant challenge and opportunity to clarify the responsibility and control of treated produced water to facilitate broader reuse outside oil and gas operations. As landowners, we have many questions about regulatory mechanisms and water rights. Is produced water considered new water? What are the obligations of a company that is discharging water? What regulatory mechanisms are needed for the state, industry or an individual landowner to retain ownership of treated water? Is a landowner able to obtain a water right for the treated water? As fresh water levels are depleted within the Permian Basin and water rights are transferred to new locations or the water source for a right is depleted, treated water will become increasingly valuable. A landowner that has a water right may see value in supplementing fresh water losses through the use of treated produced water. It is also possible that, if regulations are not developed to prioritize the treated produced water for New Mexico, the treated water could be sold to the highest bidder in another state. As demonstrated, there are many questions that should be answered in a manner that is clear and accessible to landowners and the public. We recommend you establish a team of landowners, non-governmental organizations, industry experts and agency personnel to develop regulatory mechanisms, explore water right questions, and explore potential opportunities and challenges.

Thank you again for you leadership in developing solutions for produced water. Taking this inclusive and collaborative approach will ensure a better future for all of New Mexico. The WLA looks forward to continuing to be a part of this conversation.

Sincerely,

Lesli Allison
Executive Director
Western Landowners Alliance

From: Hugh MacMillan [redacted]
Sent: Monday, December 10, 2018 5:25 PM
To: water, renewable, EMNRD
Cc: Eleanor Bravo
Subject: <no subject>
Attachments: EPA NM renewable water FINAL.pdf

To whom it concerns,

Please find attached comments re the draft white paper on oil and gas produced water "opportunities." These comments are submitted on behalf of Food & Water Watch.

Thank you!
Hugh

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December 10, 2018

Energy, Mineral, and Natural Resources Department
c/o OFS/MOU
1220 S. St. Francis Drive
Santa Fe, NM 87501

These comments are submitted to renewablewater@state.nm.edu, on behalf of Food & Water Watch members and supporters.

We are writing in response to the U.S EPA and New Mexico joint-agency white paper on "produced water opportunities." The document explains the oil and gas industry's vision for managing the liquids brought to the surface along with oil and gas in the Permian basin.

The large volumes of ancient oily radioactive brines, mixed with fracking chemicals, are seen as a future water source for food crop irrigation, and for raising food animals in the region. The need to pipe the liquid mixes of wastewater rather than trucking them around the region has pipeline infrastructure companies and investors interests piqued in rebranding the mixed liquids as "renewable water".[1]

We do not share this vision for New Mexico.

Below we explain the short-comings of white paper and its approach with respect to climate change, and the industrial pollution and risks the project implies. The aim of the document is:

To address whether the existing regulatory framework and associated policies adequately contemplate and facilitate the utilization of treated produced water, the State of New Mexico engaged the U.S. Environmental Protection Agency (EPA) to collaborate on this specific topic.

The EPA-New Mexico joint-agency memorandum states:

> The parties agree to form a collaborative workgroup to explore the further clarification and understanding of the existing regulatory and permitting frameworks and associated policy decisions among the parties associated with produced water.

The workgroup will undertake the development of a white paper related to produced water opportunities under state and federal law in New Mexico. The white paper will: (a)synthesize the regulatory and permitting frameworks related to produced water; (b)identify data gaps/policy gaps with respect to use of such water; (c) identify possible uses of renewable water, re-use water, and recycled water; and (d) identify any process or other improvement opportunities with respect to such uses.

The workgroup is expected to develop the white paper related to produced water opportunities under state and federal law in New Mexico within six months of the effective date of this MOU.

The draft white paper fails meet its stated goal and identify fundamental data and policy gaps with respect to New Mexico's energy and environmental future.

[1] Morris, Gregory. "Water management: 3 pipes in a ditch." Midstream. Vol.8, No. 2.. March/April 2018 at 28.

Climate denial

Underlying the draft white paper is the expectation of continued oil and gas drilling and fracking to maximize New Mexico oil and gas production and throughput, including for export.

This expectation sets current policy, and it is baked in to the white paper promoting commodifying oil and gas wastewater for disposal through agriculture. This is in lieu of disposing of the liquid wastes by underground injections, known for causing earthquakes. The driving force is billions of dollars in debt created on projects to increase the rates of Permian oil (and gas) extraction, debt expected to be paid back over the course of maximal production.

Hence the federal and state draft white paper on the market potential of oil and gas wastewater derives from a deep denial of climate constraints on public policy. Current state and federal energy policy is to maximize throughput and combustion of fossil fuels, lest it be wasted, and the draft white paper facilitates that shortsightedness.[2]

However, this runs contrary to established scientific consensus and agreement that communities and economies globally need to *fully decarbonize within the next two decades* to keep warming from increasing much beyond 1.5 degrees.[3]

New Mexico faces severe climate change impacts, the scientific consensus on which is most recently expressed in the U.S. National Climate Assessment (NCA).[4] The NCA states:

> Post-wildfire erosion damages ecosystems by denuding hillsides, such as occurred in Valles Caldera National Preserve in New Mexico when the 2011 Las Conchas Fire generated the biggest local erosion event in 1,000 years. In New Mexico, consecutive large wildfires degraded habitat and reduced abundance of six out of seven native coldwater fishes and some native insects, although nonnative fishes were less affected. With continued greenhouse gas emissions, models project more wildfire across the Southwest region. Under higher emissions, fire frequency could increase 25%, and the frequency of very large fires (greater than 5,000 hectares) could triple. [5]

On New Mexico's water insecurity being exacerbated by climate change, the NCA continues:

> Any increase in water requirements for energy generation from fossil fuels would coincide with reduced water supply reliability from projected decreases in snowpack and earlier snowmelt. Increased agricultural water demands under higher temperatures could affect the seasonal demand for hydropower electricity. The water consumption, pollution, and greenhouse gas emissions of hydraulic fracturing (fracking) make that source of fuel even less adaptive under climate change. Substantial energy and carbon emissions are embedded in the pumping, treatment, and transport of water, so renewable-powered water systems are less energy and carbon intense than ones powered by fossil fuels.

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[2] U.S. EPA and New Mexico. "Oil and Natural Gas Produced Water Governance in the State of New Mexico—Draft White Paper." November 9, 2018. [Available at: http://www.emnrd.state.nm.us/wastewater/documents/Oil%20and%20Gas%20Produced%20Water%20Goverance%20in%20the%20State%20of%20New%20Mexico%20Draft%20White%20Paper.pdf]

[3] See IPCC SR1.5 Chapter 2 at 2-5. Specifically, pathways not inconsistent with 1.5 (using carbon budget in parentheses) become net-zero in 25 +/- 15-20 years.]

[4] U.S. Global Change Research Program. "Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II." November 30, 2018 at Chapter 25: Southwest.

[5] U.S. Global Change Research Program. "Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II." November 30, 2018 at Chapter 25: Southwest.

With respect to the state's food insecurity, also exacerbated by climate change in the Southwest, the NCA summarizes:

> Food production in the Southwest is vulnerable to water shortages. Increased drought, heat waves, and reduction of winter chill hours can harm crops and livestock; exacerbate competition for water among agriculture, energy generation, and municipal uses; and increase future food insecurity.

For over a half-century, the issue of climate change has forced questions about the short-sightedness of equating maximal oil and gas production, throughput and combustion with energy and economic security. Thus the draft white paper can be seen as the trace of a dark energy and climate policy crisis at the federal and state level, showing an inability to cope with the reality and urgency of climate change.

To shine light on this crisis at the local level, people are organizing in communities for transitions to 100 percent renewable power in the next two decades. This is consistent with the net-zero emissions timeframe for holding global warming to 1.5° C. The draft white paper comes from a different place that blocks this necessary transition.

Orwellian greenwashing

Beyond the climate denial that imbues the draft white paper, there is the issue of reconciling the nature of the fluids brought to the surface with oil and gas, fluids which the joint-agency working group recommends be called "renewable water."

Diverse constituents range from volatile organic compounds, including the BTEX hydrocarbons, toxic metals, and radioactive material.[6] Build-up of radioactivie material in the scale, sludge and solid wastes that accumulate on oil and gas equipment, including wastewater management equipment is a growing problem in the region.[7] This reality highlights how ludicrous the rebranding effort is to turn these waters into a supposedly sustainable commodity.

In the 1980's, industry lobbied heavily for and won exclusions for drilling and fracking wastewater to not be treated as hazardous waste, despite the volatile organic compounds, (e.g. benzene, toluene, ethylbenzene and xylenes (BTEX)) and other contaminants, with fracking chemicals present but not disclosed, much less studied.[8] Testifying to the U.S. Energy Department in 1989, the head of the American Petroleum Institute stressed:

> If produced wastes are declared hazardous wastes — these are the waters produced waters that come up with the oil and are reinjected into the formation in part to pressurize it but in part because often oil comes up in a mixture of oil and water. If that were treated as

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[6] EPA. "Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States." December 2016 at Table 9-6, pages 9-39 to 9-42.

[7] Mella McEwen . "Increased production brings rise in NORM-contaminated equipment." *Midland Reporter-Telegram.* March 5, 2018. [Available at: https://www.mrt.com/business/oil/article/Increased-production-brings-rise-in-12724022.php]

[8] Mall, Amy. NRDC. [EPA petition]. "Re: Petition for Rulemaking Pursuant to Section 6974(a) of the Resource Conservation and Recovery Act Concerning the Regulation of Wastes Associated with the Exploration, Development, or Production of Crude Oil or Natural Gas or Geothermal Energy." September 8, 2010;

> a hazardous waste, then that would shut down very large number of wells in the United States because [of] the costs of handling all of that [waste].[9]

The Reagan Administration's EPA had already granted the exemption from regulation as hazardous under the Resource Conservation and Recovery Act, but the worry was still on the industry's mind.

The EPA's December 2016 report on fracking's impacts on drinking water resources (HFDW report) summarizes the oil and gas industry's current waste management streams and the associated risks:

> Each of the wastewater management strategies can potentially lead to impacts on drinking water resources during some phase of their execution. Such impacts include, but are not limited to: accidental releases during transport; discharges of treated wastewaters from CWTs or POTWs where treatment for certain constituents has been inadequate; migration of constituents to groundwater due to leakage from pits or land application of wastewaters; leakage from pits that reach surface waters; inappropriate management of liquid or solid residuals (e.g., leaching from landfills); or accumulation of constituents in sediments near outfalls of CWTs or POTWs that are treating or have treated hydraulic fracturing wastewater.[10]

California provides a relevant cautionary tale for the use of produced water in agriculture as well as a glimpse into the extent of the contamination that can be found in produced water. In 2016, the Central Valley Water Board ordered seven oil companies that provide wastewater to nearby irrigation districts to disclose the chemicals they use in drilling. An analysis by University of California researchers found:

- 173 chemicals were disclosed over a two-and-a-half year period
- 66 were listed as "trade secret" or could not be identified
- 8 are on the Proposition 65 list
- 10 are known or suspected carcinogens[11]

It is also vital to point out that many of the chemicals that could be found in produced water lack standard procedures for identifying them in water and may be very difficult to treat with standard wastewater treatment.[12] Additionally, many chemicals associated with drilling lack agricultural water quality standards.

With regard to repeated use of wastewater for fracking injections, followed by ultimate injection — or disposal through the food system— the EPA's HFDW report cautions against the build-up (i.e., technological enhancement) of naturally occurring radioactive material (TENORM):

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[9] DiBona, Charles. President and CEO. American Petroleum Institute. Speaking at DOE National Energy Strategy workshop: "Energy defense and security interests." C-SPAN. December 13, 1989 at 2:13:44 [https://www.c-span.org/video/?10300-1/national-energy-strategy-pm-session]

[10] EPA. "Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States." December 2016 at 8-15.

[11] Shonkoff, S.; Stringfellow, W.; Domen, J. "Hazard Assessment of Chemical Additives Used in Oil Fields that Reuse Produced Water for Agricultural Irrigation, Livestock Watering, and Groundwater Recharge in The San Joaquin Valley of California: Preliminary Results." Technical Report. 2016. Available at https://www.psehealthyenergy.org/wp-content/uploads/2017/04/Preliminary_Results_13267_Disclosures_FINAL-1.pdf

[12] Shariq, L. "Uncertainties Associated with the Reuse of Treated Hydraulic Fracturing Wastewater for Crop Irrigation." Environ. Sci. Technol. 2013, 47, 2435−2436

With reuse there is the potential for accumulation of dissolved solids such as salts and TENORM in the wastewater over successive reuse cycles. Because wastewater is often reused with minimal treatment, constituents resulting from time spent in the subsurface remain in the wastewater and can increase during additional hydraulic fracturing. This potentially concentrated wastewater can pose a bigger issue if a breach occurs in an on-site pit or tank storing this wastewater while awaiting reuse.

The issue of concentrating contaminants during reuse has not yet been quantitatively evaluated in the literature. Also, it is not known how much this problem would be mitigated due to the dilution of wastewater when reused as new fracturing fluid. … As reused wastewater continues to accumulate contaminants, the water will eventually need to be managed, either through treatment or injection.[13]

Whereas other shale plays see ratios of one barrel of wastewater per one barrel of oil, in the Permian operators are seeing five-to-one, even ten-to-one, meaning there is that much more wastewater to be dispensed with, and added cost.[14] An analyst explains how in just a few years the scale of fracking water demand, and thus also drilling and fracking wastewater production, has expanded in the Permian:

> Needing 30 to 40 times more water upfront is not just a difference volume, it is a fundamental difference in kind. Until recently, operators could usually get all their water from a single surface-use agreement. But most surface owners just can't supply that much water in that much time, so operators now have to search the whole area for supplies.[15]

Demand for drilling and fracking water is proving seasonal in the Permian. Water's been taken for fracking injection most in the first half of the year in recent years in the Permian, competing with other uses, including agriculture.

The prospect of securing deals to dispose of the treated wastewater through municipal waste treatment facilities, surface releases, and on food crops, has become a golden goose for the industry in the region, and the EPA and state agencies are bending over backward to oblige in the drafting of the white paper.

Given the oil and gas industry's long history of maintaining control over data, and shirking regulatory oversight, opening up a free-flowing wastewater market is a recipe for cutting corners and corporate abuse.

To the extent water is treated — or, "renewed" as industry would deem it — there are residual, concentrated, typically radioactive solid wastes and sludges that are produced, and that require dumping in landfills, raising more questions.

Landfill disposal is taken for granted in the draft white paper, without discussion of the implications for the public. EPA's 2016 study of fracking's impacts on drinking water cautioned:

> Solid and liquid residuals associated with hydraulic fracturing wastewater (treatment residuals from CWTs, sludges from tanks and pits, and pipe scale) could have impacts on drinking water resources if not managed and disposed of properly. Liquid residuals are inappropriate for surface water discharge or discharge to a POTW due to high concentrations of salts and other contaminants; they are commonly disposed of in an injection well. Solid residuals may leach a

[13] EPA. "Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States." December 2016 at 8-39.
[14] Wood Mackenzie. Crude for thought. [Podcast]. "Does Permian Basin Oil Have A Produced Water Problem." [Available at: https://soundcloud.com/woodmackenzie/crude-for-thought-does-permian-basin-oil-have-a-produced-water-problem
[15] Morris, Gregory. "Water management: 3 pipes in a ditch." Midstream. Vol.8, No. 2.. March/April 2018 at 28.

number of constituents, such as alkali metals, alkaline earth metals, and bromide. They can also contain TENORM if radionuclides are present in the wastewater being treated. Given that residuals are commonly disposed of in landfills, TENORM can be problematic due to the possibility of radon emissions and radioactivity in the landfill leachate. Solids from pits or tanks can also contain TENORM if the wastewater contains radionuclides, and one study has shown the potential for radioactivity to increase in the closed environment of tanks.[16]

New Mexico has a long history of toxic waste disposal problems. This white paper would have the state continue down that path and further risk the water and food supplies of the state. It's time to put that extractive mindset, and harmful waste disposal, behind us.

Conclusion

In closing, we are writing to urge you to turn the page on the oil and gas industry in the state of New Mexico, and focus administrative attention to a just transition off fossil fuels. Climate science alone warrants such action.

New Mexico possesses vast amounts of latent wind and solar power, yet to be built, and, like elsewhere around the country, the state has huge opportunities to slash fossil energy demand further through efficiency and storage technologies, coupled with those clean, distributed energy sources.

Despite the policy-level denial of the climate constraint, the authors of the white paper have the audacity to suggest — instead — that treating ancient oily brines, mixed with fracking chemicals, for use in food crop irrigation, and to raise animals, amounts to a tool in the climate adaptation toolbox.[17]

This adds insult to injury from decades of climate inaction. Re-branding oil and gas wastewater as renewable water won't fly in New Mexico. We urge you to marshal the state's resources for genuine climate action, not this joint-agency effort to put lipstick on a pig.

Thank you for your attention,

Food & Water Watch

[16] EPA. "Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States." December 2016 at 8-70.

[17] U.S. EPA and New Mexico. "Oil and Natural Gas Produced Water Governance in the State of New Mexico—Draft White Paper." November 9, 2018 at 1 and 2, where drought conditions serve as motivation for coining "renewable water"; also see Figures 3, 4, 5, 7, 8, 9 and 10 for the evolution of oil and gas wastewater disposal.

P.O. Box 4339
San Felipe Pueblo, NM 87001

Phone: (505) 867-3381/3382
FAX: (505) 867-3383

PUEBLO OF SAN FELIPE

Office of the Governor

December 10, 2018

US Environmental Protection Agency
David P. Ross Assistant Administrator
Office of Water
1200 Pennsylvania Avenue, N.W. 4101M
Washington, DC 20460

US Environmental Protection Agency Region 6
Regional Administrator Anne Idsal
1445 Ross Ave.
Dallas, TX 75202

New Mexico Energy, Minerals and Natural Resources Department
Cabinet Secretary Ken McQueen
1220 South St. Francis Drive
Santa Fe, NM 87505

New Mexico Environment Department
Cabinet Secretary Butch Tongate
PO Box 5469
Santa Fe, NM 87502-5469

New Mexico Office of the State Engineer
5550 San Antonio Dr NE
Albuquerque, NM 87109

Dear Honorable US EPA and State of New Mexico Representatives:

We are writing to you today to comment on the MOU signed between the EPA Region 6 and the NMED regarding Produced Water, and the resulting White Paper.

The Pueblo of San Felipe has made its position very clear at the local, state, regional and national levels that increased oil and gas activity is a detriment to San Felipe Pueblo cultural and religious sites and practices, is an environmental justice issue that our state and federal partners are ignoring, and the increase in oil and gas operations in New Mexico are, and will negatively impact the health, happiness and prosperity of many Native Americans.

We understand the dominate culture demands progress and greatness, never mind the actual costs. To call this water which is briny[1], and laced with chemicals a resource to be considered for agriculture or wildlife is perverse, and contrary to our values, tradition and culture as Pueblo people.

Manifest Destiny was used in the nineteenth century to justify removal of Native Americans from their homelands and to favor land speculators[2]. This push for oil and gas is today's Manifest Destiny, not only westward, but below; and unchecked will have devastating consequences.

The EPA failed to follow its policy to engage in meaningful and timely Tribal Consultation with the Pueblo of San Felipe, and the State also failed to follow its commitments under the State Tribal Collaboration Act when both entities neglected to consult with the Pueblo of San Felipe regarding the elements in the MOU and White Paper.

We are strongly opposed to EPA's concurrent reductions in waters protected under the Clean Water Act, and this coddling of oil and gas industry to somehow call poisoned water "produced water" and then tout it as a resource.

We are asking that the health of the people and wildlife who rely on land and water for life be protected over moneyed interests.

We are requesting that both the EPA and the NMED begin Government to Government consultation with the Pueblo of San Felipe on produced water and unchecked fracking and oil and gas lease sales within the state of New Mexico, which are adversely impacting cultural sites and resources, and human health.

Sincerely,
Pueblo of San Felipe

Governor Anthony Ortiz

Lt. Governor Carl Valencia

cc: Felicia Wright, Acting Director EPA American Indian Environmental Office
Arturo Blanco, Director of EPA Environmental Justice, Tribal and International Affairs
Kathryn Becker, NMED Tribal Liaison

[1] https://www.ag.ndsu.edu/publications/environment-natural-resources/environmental-impacts-of-brine-produced-water

[2] Smithsonian https://americanexperience.si.edu/wp-content/uploads/2015/02/Manifest-Destiny-and-Indian-Removal.pdf

From: Maggi Young [redacted]
Sent: Monday, December 10, 2018 6:21 PM
To: water, renewable, EMNRD
Cc: [redacted] Roger Kelley
Subject: Oil and Natural Gas Produced Water Governance in the State of New Mexico- Draft White Paper_AXPC, DEPA comments
Attachments: AXPC, DEPA comments on NM Draft Whitepaper 12102018 FINAL.pdf

Classification: DCL-Internal

Good Afternoon –

On behalf of the American Exploration and Production Council (AXPC) and the Domestic Energy Producers Alliance (DEPA), please accept the attached document detailing comments and recommendations regarding the draft white paper released by the State of New Mexico and the U.S. EPA. AXPC and DEPA thank you for the opportunity to comment and look forward to future conversations discussing these important issues.

Thank you,
Maggi Young
Regulatory Affairs | Federal
Chesapeake Energy Corporation
[redacted]

CHESAPEAKE ENERGY

December 10, 2018

Via Email

Matthias Sayer
Deputy Secretary
New Mexico Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, NM 87505

James Kenney
Senior Policy Advisor for Oil and Natural Gas
United States Environmental Protection Agency
William Jefferson Clinton Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re: Comments of the American Exploration and Production Council and the Domestic Energy Producers Alliance on the Draft White Paper: Oil and Natural Gas Produced Water Governance in the State of New Mexico.

Dear Sir/Madam

This letter provides comments from the American Exploration and Production Council ("AXPC")[1] and the Domestic Energy Producers Alliance ("DEPA")[2] (collectively, "the Associations") on the Draft Whitepaper entitled "Oil and Natural Gas Produced Water Governance in the State of New Mexico" ("Draft Whitepaper") that was developed by the U.S. Environmental Protection Agency ("EPA" or "the Agency") and the State of New Mexico. We appreciate EPA and New Mexico's

[1] AXPC is a national trade association representing 33 of America's largest and most active independent natural gas and crude oil exploration and production companies. The AXPC's members are "independent" in that their operations are limited to the exploration for and production of natural gas and crude oil. Moreover, its members operate autonomously, unlike their fully integrated counterparts, which operate in different segments of the energy industry such as refining and marketing. The AXPC's members are leaders in developing and applying the innovative and advanced technologies necessary to explore for and produce natural gas and crude oil that allows our nation to add reasonably priced domestic energy reserves in environmentally responsible ways.

[2] DEPA is a unique organization with a grassroots approach to domestic onshore energy advocacy and education. We are an alliance of producers, royalty owners, and oilfield service companies as well as state and national independent oil and gas associations representing the small business men and women of the energy industry, devoted to the survival of U.S. domestic crude oil and natural gas exploration and production. DEPA's members are leaders in developing and applying the innovative and advanced technologies that allow our nation to add reasonably priced domestic energy reserves in a fair and equitable market.

efforts to facilitate a dialogue on opportunities to reuse, recycle, and return produced water to the hydrologic cycle, and we are grateful for the opportunity to provide our feedback on the Draft Whitepaper.

The Associations support EPA and New Mexico's efforts to clarify the existing regulatory and permitting frameworks related to the way produced water from oil and natural gas extraction is currently managed, and efforts to identify gaps in the regulatory and policy framework that discourage/disincentivize produced water that can be reused, recycled, and renewed for other purposes. In this effort, the Associations encourage EPA and New Mexico to continuously weigh the costs and benefits of the various options throughout this process and seek those options that are the least costly and burdensome on operators to encourage the reuse, recycle, and renewal efforts.

Indeed, while the Draft Whitepaper is focused on the governance of produced water in New Mexico, its discussions of water scarcity, produced water management options, and the potential for produced water reuse, recycling, and renewal have relevance throughout the country. Even the regulatory and policy discussions, which are necessarily specific to New Mexico, provide relevant information on federal regulatory impacts, the jurisdictional interplay between states and EPA, and regulatory frameworks that are common to many states.

While the Associations herein recommend a handful of modest changes and clarifications, we offer these suggestions with a genuine interest in supporting this important effort. In addition to supporting the analysis contained in the Draft Whitepaper, we are encouraged by the cooperative effort that led to the Draft Whitepaper. EPA and New Mexico's collaboration on this issue reflects the precise type of cooperative approach that Congress intended when it drafted the Clean Water Act ("CWA"), and the Associations hope it will provide a model for more widespread cooperation between EPA, states, the oil and natural gas industry, and other stakeholders. Through such cooperation, we are confident we can identify opportunities to protect water quality and resource scarcity by expanding treatment of produced water for reuse, recycling, and renewal into the hydrologic cycle.

I. INTERESTS OF THE ASSOCIATIONS

Many of the Associations' member companies operate in New Mexico, and are therefore quite familiar with the profound water scarcity concerns that the state has been working to address. These same members are similarly acquainted with the produced water management options in New Mexico and the regulatory and permitting structure governing those options. These members are directly impacted by the impediments to produced water reuse, recycling, and renewal that are discussed in the Draft Whitepaper, and therefore have a direct interest in the potential regulatory and policy improvements identified in Section 3 of the Draft Whitepaper.

In addition to the Associations' direct interest in the governance of produced water in New Mexico, the Associations share a broader interest in protecting and conserving water resources on a national basis. Not only do the Associations' members comply with the extensive CWA regulations imposed on them at all levels of government and across multiple jurisdictions, they work through the Associations to develop and implement industry standards, share best practices, facilitate chemical and water use disclosures, and work with regulators to ensure that their operations

responsibly protect water and other resources. While New Mexico's drought concerns are indeed acute, many other states – including several states that are not traditionally considered arid – are similarly struggling with water scarcity. And for those states with oil and natural gas operations that generate significant volumes of produced water, the regulatory constraints and opportunities for expanding produced water reuse, recycling, and renewal are likely quite similar to the constraints and opportunities presented in New Mexico.

In multiple basins, our members have developed and deployed innovative technologies to use brackish or recycled water for hydraulic fracturing and to recycle more of our produced water back into the hydraulic fracturing process. Nonetheless, treatment for infield reuse has limitations related to the stage of field development, the proximity of new wells to the produced water, and the quantity and volume of the produced water.

While the Associations' members are working hard to maximize infield reuse and develop other avenues for recycling treated produced water outside of the oil and natural gas industry, they are hindered by many of the same federal regulations that the Draft Whitepaper identified as impediments to expanded produced water reuse, recycling, and renewal. Rather than providing standards that facilitate safe reuse, recycling, and renewal of produced water, these decades-old regulations largely banned treatment and discharge of produced water with the expectation that it would be disposed in underground injection control ("UIC") wells or allowed to evaporate.

It may have made sense to prohibit other produced water management options in 1979 when EPA expected that UIC capacity need only be sufficient to carry the domestic oil and natural gas industry through its few remaining years of viability, but this inflexible approach does not make sense now that the United States once again leads the world in natural gas and crude oil production. More fundamentally, the Associations do not believe it ever made sense to treat valuable water resources as pollutants or wastes requiring disposal. While the Associations believe that UIC wells will continue to provide an important produced water disposal option, we share EPA's and New Mexico's interest in expanding produced water management options to create more opportunities for its reuse, recycling, and renewal for other purposes.

The Associations hope that the cooperative approach and shared interests reflected in the Draft Whitepaper will lead to regulatory changes that reflect the importance of conserving water resources, rather than incentivizing their disposal. Our members are looking for produced water management options that protect receiving waters and replace unnecessary restrictions with clear and consistent standards that aid industry decision-making and foster innovation – similar to the management options and standards currently enjoyed by municipalities and other industries. We believe that resource protection need not come at the expense of conservation, and we further believe that efforts such as this can help remove barriers to safe and responsible reuse, recycling, and renewal of produced water.

II. SPECIFIC COMMENTS AND RECOMMENDATIONS

The Associations offer the following comments and recommendations on the Draft Whitepaper.

- Section 2 of the Draft Whitepaper provides a comprehensive review of the relevant produced water reuse, recycling, and renewal scenarios, as well as the regulations that

govern and impact those scenarios.[3] Nonetheless, Section 2 presents an incomplete portrayal of these scenarios because it fails to discuss the costs associated with each of these potential dispositions. Although cost is only one of many factors that influence how produced water will be managed, it is still an important factor.

For instance, water acquisition costs are a major driver of reuse, recycling, and renewal. As water scarcity, and therefore acquisition costs, increase, previously infeasible treatment technologies and produced water dispositions may become cost-competitive. Similarly, the volume of produced water that may be reused, recycled, or renewed in a given basin is likely proportionate to the cost and availability of UIC disposal. Where UIC disposal is unavailable, constrained, or requires long-distance transport, more reuse, recycling, and renewal options may become cost-competitive.

While federal and state regulatory and policy frameworks do indeed shape produced water management options, it is difficult to meaningfully evaluate opportunities to expand produced water reuse, recycling, and renewal without considering the impacts of these policies on cost of water acquisition, treatment, and disposal. The Associations therefore recommend that the Draft Whitepaper be expanded to discuss these cost impacts.

- Because this Draft Whitepaper is intended to guide federal and state decision-making on produced water management options, the Associations believe it is important to explicitly and clearly identify those produced water management options that are not currently constrained or impeded by regulations or permit requirements. We fully support the Draft Whitepaper's identification of those gaps in the regulatory and policy framework that provide opportunities to increase treatment of produced water for recycling and renewal, but we believe it is equally important to identify those aspects of the regulatory and policy framework that currently provide pathways to conserve water resources through produced water management.

  For instance, some produced water management options do not result in discharge, and are therefore not subject to permitting requirements under the National Pollution Discharge Elimination System ("NPDES") program. Because these non-discharging produced water management options are beyond the scope of the NPDES permit program, states have greater flexibility to regulate these options in a way that accounts for state-specific conditions and considerations, and rely on the more localized expertise of state environmental and resources management agencies. This absence of unnecessary federal permitting requirements in these instances is consistent with the CWA's jurisdictional limits and necessary for incentivizing these beneficial management options. We recommend that the Draft Whitepaper specifically identify these produced water management options as dispositions that are outside NPDES jurisdiction and that should remain within the exclusive purview of states.

  Similarly, federal statutes and regulations require that states, and not the federal government, make decisions about whether produced water, treated produced water, and products derived from produced water treatment are regulated as wastes and require special

[3] Table 1 of the Draft Whitepaper provides an effective and concise portrayal of these scenarios.

management considerations. This jurisdictional limitation provides states the flexibility to regulate produced water in ways that can promote its reuse, recycling, and renewal. We therefore recommend that the Draft Whitepaper explicitly recognize that observance of these jurisdictional limits is necessary to protect beneficial produced water management options.

While the Associations recognize that Draft Whitepaper discusses many of these favorable aspects of the regulatory framework, those discussions are buried within the background narratives. We recommend that EPA and New Mexico compile these recommendations and present them as recommendations in Section 3 of the Draft Whitepaper. Doing so can help ensure that any subsequent decisions on produced water governance remain squarely focused on gaps in the regulatory and policy framework. This is particularly important because many of these jurisdictional limitations and interpretations are currently under review by EPA.[4]

- The Associations recommend that the Draft Whitepaper be updated to include a more detailed discussion of cooperative federalism and the important role of states in regulating produced water management options. As noted above, the CWA, the Resource Conservation and Recovery Act, and many other environmental statutes recognize and explicitly preserve meaningful roles for states in managing and protecting their resources – and for good reason. States are best positioned to manage these regulatory programs because they are more knowledgeable about local conditions and better understand the need for, and impacts of, regulations and policies. Moreover, because produced water regulation directly affects matters like water use, availability, and conservation that are under exclusive state control, it is particularly important that any changes to federal regulation of produced water management options protect and preserve state primacy.

- The Associations believe that Item 6 in Section 3 understates the level of scientific understanding about the constituents of produced water, and overstates the data gaps in produced water characterization. We are not aware of any industrial or municipal effluent for which all potential constituents are fully characterized. While there may be data gaps with respect to produced water, the characterization of the constituents of produced water is highly refined relative to many other industrial/municipal effluents. This more accurate depiction of the state of scientific understanding should be provided in the Draft Whitepaper, as the perceived data gaps are hardly sufficient to justify the delay of regulatory changes that could result in expanded reuse, recycling, and renewal of produced water.

  Regulators and the scientific community know a great deal about the constituents in produced water, and the Associations believe the Draft Whitepaper should be revised to

[4] Repeal and replacement of Waters of the United States Rule (EPA-HQ-OW-2017-0203); Request for Comments on Clean Water Act ("CWA") Coverage of "Discharges of Pollutants" via a Direct Hydrologic Connection to Surface Water (EPA-HQ-OW-2018-0063).

more accurately describe the extensive and detailed produced water characterization data that already exists.

To begin with, the Draft Whitepaper should recognize and discuss the immensely valuable chemical use information that companies disclose (often voluntarily) on the registry, FracFocus.org ("FracFocus"). Our industry is proud of our role in developing the FracFocus registry and the Associations are proud of our members' continued efforts to populate it with detailed chemical use information. We believe FracFocus is emblematic of our industry's strong commitment to transparency and our genuine interest in working with regulators. As of November 30, 2018, over 1000 individual companies have registered more than 127,000 wells and submitted more than 80,000 chemical use disclosures.[5]

The chemical use information disclosed on FracFocus is extensive and highly detailed. While some company disclosures protect as proprietary certain constituents in the hydraulic fracturing fluid systems, the overwhelming trend is toward 100% disclosure. Where proprietary protections are sought, the companies are commonly protecting specific ingredients within additives that represent less than a thousandth of a percent (0.001%) of the total hydraulic fracturing fluid volume. Even those circumstances where precise chemical identification is not publicly released, the industry typically provides chemical category information that allows the public to identify the class and function of the chemical, and many states require that the precise identity of these ingredients be disclosed to regulators.

Moreover, the propriety protections sought for specific components of the hydraulic fracturing fluid matrix are no different than the protections other industries claim in the context of reporting and labeling requirements. Indeed, FracFocus disclosures provide more detailed information about the constituents of hydraulic fracturing fluid than the Food and Drug Administration requires to be disclosed for cosmetics,[6] perfumes and fragrances (either alone or in personal care products),[7] or dietary supplements.[8] Our industry discloses more about hydraulic fracturing fluid than is required to be disclosed for household cleaners,[9] and we provide more information about the chemicals we use to stimulate wells that the U.S. Department of Transportation requires for chemicals and hazardous materials.[10]

Because FracFocus and other sources provide such detailed information about the precise chemicals that are injected into oil and natural gas wells for stimulation, there is a great deal of scientific understanding about the constituents that return to the surface in produced water. There has also been extensive sampling and analysis across each of the major oil

[5] https://fracfocus.org/welcome
[6] 21 C.F.R. § 701.3(a).
[7] *Id*. §§ 701.3(a), 701(1)(2)(iii).
[8] 21 C.F.R. §§ 101.36(b),(c).
[9] 15 U.S.C. § 1261.
[10] 49 C.F.R. §§ 172.505, 172.602.

and natural gas basin of the naturally occurring constituents of produced water. In fact, EPA, through multiple efforts has compiled this extensive information.

The Technical Development Document for EPA's 2016 rule prohibiting indirect discharge of certain produced water to publicly owned treatment works ("POTWs") contains thousands of data points on dozens of constituents in produced waters from nearly every major oil and natural gas basin in the United States.[11] Less than two years ago, EPA viewed this data as providing a sufficient basis for a major change in the Agency's regulation of produced water.

Also in 2016, EPA completed a five-year study entitled "Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States.[12] This study, which EPA heralded as the synthesis of "over 1,200 sources including published papers, technical reports, results from peer-reviewed Agency research, and information provided by industry, states, tribes, non-governmental organizations, and other interested members of the public,"[13] devoted entire chapters to identifying the chemicals used in the hydraulic fracturing fluid matrix, characterizing the constituents of produced water, and describing the potential risks associated with produced water management.

Finally, EPA just a few short months ago published its "Detailed Study of the Centralized Waste Treatment ("CWT") Point Sources Category for Facilities Managing Oil and Gas Extraction Wastes.[14] This study, which took Agency staff four years to research and draft, provides the exact information that the Draft Whitepaper recommends developing. In fact, it is almost entirely focused on the characteristics of produced water, the technologies available to treat produced water, the characteristics of treated produced water, and the potential environmental impacts of discharging or releasing both untreated and treated produced water. Moreover, the data on which the study was based is extensive. It compiled and analyzed thousands of produced water samples, dozens of academic studies, extensive information provided by the oil and natural gas industry and states, CWT permitting documents, discharge monitoring reports, spill reports, FracFocus disclosures, and water quality monitoring reports.

The Associations do not offer this information to suggest that there is no need for further efforts to characterize the constituents of produced water. We believe there is always room to advance our understanding of the constituents of produced water. Indeed, our members have taken real and meaningful steps to increase disclosure, transparency and scientific study. We remain concerned, however, that the Draft Whitepaper can be construed to suggest that the level of scientific understanding about the constituents of produced water is not sufficient to inform regulatory changes which could expand the reuse, recycling, and renewal of produced water. The data available to characterize produced water far exceeds the datasets on which EPA and states have promulgated discharge limits for other industries

[11] 81 Fed. Reg. 41,845 (June 28, 2016); TDS at EPA-820-R-16-003 (June 2016).
[12] https://www.epa.gov/hfstudy.
[13] https://blog.epa.gov/2016/12/13/epa-releases-final-report-of-the-potential-impacts-of-hydraulic-fracturing-on-drinking-water-resources/
[14] EPA-821-R-18-004 (May 2018).

and municipalities. Moreover, from a water protection standpoint, the relevant inquiry is with respect to the constituents in the *treated* produced water for discharge. This is no different than what is analyzed for all other industrial or municipal discharges, and importantly, the characterization data for treated produced water is especially robust.

While it is appropriate for the Draft Whitepaper to call for continued analysis of produced water, the Associations want to ensure that produced water is subject to the same data requirements and analytical standards that are applied to other industries' and municipalities' effluents. We therefore ask that the Draft Whitepaper be amended to describe the high level of scientific understanding about the constituents of produced water and to explicitly state that we currently possess data sufficient to develop regulations and polices that can expand the reuse, recycling, and renewal of produced water.

- Finally, the Associations support the Draft Whitepaper's identification in Items 10-12 in Section 3 regarding the need for further collaboration and engagement. The Associations have a deep interest in working collaboratively with EPA, New Mexico, and other states in produced water management as well as other issues. And it is clear to us from this opportunity to provide feedback, EPA's outreach efforts, and many other interactions, that EPA and New Mexico share our commitment to expanding produced water reuse, recycling, and renewal. We hope EPA and New Mexico will view the Associations and our members as credible stakeholders and resources in any future efforts to update produced water regulations or policies.

II. CONCLUSION

The Associations appreciate the opportunity to provide these comments on the Draft Whitepaper. We are grateful for EPA and New Mexico's efforts to address these important issues and look forward to working with EPA and the state on identifying opportunities to expand the reuse, recycling, and renewal of produced water. If you have any questions or would like to discuss these comments, please feel free to contact Bruce Thompson at [redacted], Roger Kelley at [redacted]

V. Bruce Thompson
President
American Exploration & Production Council
[redacted]

J. Roger Kelley
Chairman – Regulatory
The Domestic Energy Producers Alliance
[redacted]

From: Drew Dixon [redacted]
Sent: Monday, December 10, 2018 6:45 PM
To: water, renewable, EMNRD
Subject: Comments on Draft White Paper On Oil And Natural Gas Wastewater, Recycling And Reuse
Attachments: Signed.Letter.Comments.White.Paper.pdf

Good afternoon,

Please find attached a letter outlining the comments of Solaris Water Midstream, LLC to the Oil and Natural Gas Produced Water Governance in the State of New Mexico—Draft White Paper.

Thank you for your attention to this matter.

Sincerely,

Drew Dixon
Vice President Land, Permitting & Regulatory
Solaris Water Midstream, LLC
[redacted]

SOLARIS
WATER MIDSTREAM

December 10, 2018

Energy, Mineral, and Natural Resources Department
c/o OFS/MOU
1220 S. St. Francis Drive
Santa Fe, NM 87501

Re: Oil and Natural Gas Produced Water Governance in the State of New Mexico—Draft White Paper Requested Comments

To whom it may concern,

Solaris Water Midstream, LLC ("Solaris") is pleased to have the opportunity to comment on the Oil and Natural Gas Produced Water Governance in the State of New Mexico Draft White Paper. Solaris commends the State of New Mexico and the EPA for their collaborative effort during the development of this White Paper and the recognition that there will be significant challenges in handling the vast amounts of produced water projected in the future as the development activities in the Delaware Basin continue to rise to historic levels.

Solaris is a full-service water midstream company focused on developing integrated water infrastructure assets for produced, recycled and fresh water in the Permian Basin across both New Mexico and Texas. Solaris operated produced water pipeline systems gather produced water from operators and transport this produced water to both disposal and recycle facilities. Solaris's produced water gathering systems further allow Solaris to distribute recycled water to strategically located off-take points to cost effectively enable operators to utilize recycled water during drilling and completion activities. Consequently, Solaris is very supportive of any efforts to better define parameters and methodologies which encourage recycling and re-use where appropriate. Such methods, when properly developed with appropriate assumptions and underlying infrastructure, will reduce reliance on fresh water resources and will help limit the consumption of fresh water during drilling and completion activities.

A stated goal of the White Paper is to provide a roadmap for stakeholders navigating the existing federal and state regulatory roadmaps and to identify policy gaps and opportunities to streamline existing frameworks. In light of having to consider the regulatory framework associated with both State and Federal Lands in New Mexico, Solaris believes it is important that the agencies charged with managing access to these lands further align their positions and requirements for both temporary and permanent produced water pipeline infrastructure. To encourage the recycle and re-use of produced water, it is imperative that the process and time it takes to obtain both temporary and permanent infrastructure is streamlined and simplified and any requirements associated with permitting such infrastructure is consistent amongst the agencies.

Solaris hopes that the State and EPA recognize that any efforts for recycle and re-use will require significant capital investment including the construction and operation of containments and aboveground storage tanks. While the White Paper discusses the circumstances in which registration and permitting is required, there remains some confusion regarding the appropriate use of the C-147 "Short" Form or C-147 "Long" Form for the registration and permitting of such facilities. Solaris specifically requests that guidelines are provided relating to which form is appropriate under the various circumstances.

Lastly, the White Paper discusses opportunities to streamline existing regulations by clarifying responsibility and control of treated produced water. The White Paper further suggests that one approach to remedying the uncertainty might be to clarify that while the State of New Mexico retains its public trust ownership of

produced water, the surface owner has a right of possession, which could be contracted or leased. While Solaris believes it is important to protect the rights of both the surface and mineral owners, Solaris believes this statement inherently creates confusion if the State has ownership and the surface owner has possession. Further thought should be given on the point of ownership versus possession and the possible encumbrances this could create in the beneficial use of produced water.

Although the White Paper was intended to address the use produced water to help alleviate water scarcity issues in New Mexico, Solaris believes it is important to recognize that there will remain instances in which disposal wells will be required. However, we look forward to continuing to review the White Paper as both the State and EPA continue to develop the tools and informational resources needed to support and advance the recycle and re-use of produced water in New Mexico.

If you have any questions about the comments, please feel free to contact me.

Sincerely,

L. Drew Dixon
Vice President Land, Permitting & Regulatory
Solaris Water Midstream, LLC
[redacted]

From: [redacted]
Sent: Monday, December 10, 2018 6:55 PM
To: water, renewable, EMNRD
Subject: Fracking Wastewater Proposal

Greetings,

I am writing to oppose the use/reuse of fracking wastewater in New Mexico. We are facing an extraordinary challenge related to climate change. New Mexico is an arid state lacking in water for human uses in agriculture and to sustain life, not just human life but the lives of countless other species in the ecosystem.

We must move away from the production of gas and oil through the use/abuse of water. Our very existence on the planet is threatened with the poisoning of our precious water. We must protect the clean water we have, we must protect our aquifers, and we must move toward clean energy sources.

New Mexico has an abundance of alternative and clean energy resources.

Please do not approve the use of fracked water on and into our land.

Sincerely,

Barbara Grothus
[redacted]

From: L.R. [redacted]
Sent: Monday, December 10, 2018 7:05 PM
To: water, renewable, EMNRD
Subject: Fracking Wastewater Proposal

Hi, I have recently read the "Oil and Natural Gas Produced Water Governance in the State of New Mexico - Draft White Paper" on the proposed use of fracking wastewater or produced water in the State of New Mexico and have found what was contained in it to be highly alarming. I have recently learned more about the leasing of public lands by the BLM in the Greater Chaco Region despite over 100 organizations, over 10,000 public comments, dozens of Tribes, Navajo Chapters and the All Pueblo Council of Governors requesting a moratorium on further oil and gas exploration and development until an adequate Resource Management Plan assessment can be completed. Reports of negative health effects and traces of oil in drinking water have already been reported amongst the Navajo community that lives in the area. This white paper is a continuance of these issues and the concerns of the residents of New Mexico that are not currently being addressed.

The white paper starts off addressing the water concerns of New Mexico and then moves on to propose treatment of wastewater from the oil and gas industry and the reintroduction of it to the ground waters, underground aquifers, agricultural systems. municipal systems, etc. This proposed use of treated wastewater from the oil and gas industry could compromise and pollute our already limited and stressed water ways, aquifers and fresh water supplies. The very nature of the oil and gas industry also threatens our fresh water as well as using and contaminating an immense amount of it in the extraction process. As stated in the white paper, "for every
barrel of oil, four or five barrels of produced water may be generated: an estimated 168 to 210 gallons of produced water for every 42 gallons of oil produced. In 2017, oil and natural gas production in New Mexico generated 900 million barrels, or 37.8 billion gallons of produced water. As oil and gas production volumes continue to grow in New Mexico, so will the amount of produced water".

It makes little sense in a state with a finite and delicate water supply to continue to use immense amounts of water to extract finite resources in a manner that contaminates the water and then propose to treat that water and reintroduce it to our fresh water supplies, agricultural systems, municipal water systems, etc until we have a comprehensive understanding of what that implies from a human health and environmental perspective in every sense. Until the issues and concerns of the residents of the State of New Mexico (particularly those living in the area) have been validly addressed and those who are being affected by this industry are having their voices heard, there should be a moratorium on further oil and gas exploration and development in the Greater Chaco Region.

Geologists have linked fracking and the wastewater injection wells that are discussed in the white paper to a rise in earthquakes as well. Oklahoma has historically had an average of one to two sizable earthquakes per year but in the past few years that number has risen to two to three per day. Oklahoma has passed California as the most seismically active state in the lower 48. This increase is due to an industry that currently surrounds and is encroaching upon perhaps the greatest archaeological site in the country, Chaco Canyon. The historical and cultural significance of this iconic National Historical Park is immeasurable. The close proximity of the oil and gas industry operations to this park is extremely alarming. I would not want to be a part of an agency or administration that facilitates irresponsible oil and gas operations that could be connected to any seismic activity that could damage this precious landmark. I ask the recipients of this email to please contemplate deeply on what the best course of action to take is in the Greater Chaco Region because what we do now could have deep implications for the future in many regards.

Thank you,

Alankin Roybal

From: John Noel [redacted]
Sent: Monday, December 10, 2018 7:40 PM
To: water, renewable, EMNRD
Cc: 'Kenney, James'
Subject: CWA Comments on EPA NM Produced Water Governance
Attachments: Clean Water Action Comments on EPA NM Produced Water Governance.pdf

Please see Clean Water Action's comments attached. Thank you.

John

_____
John Noël
National Oil & Gas Program Director
Clean Water Action
[redacted]

CLEAN WATER ACTION

December 10, 2018

Energy, Mineral, and Natural Resources Dept.
c/o OFS/MOU
1220 S St. Francis Drive
Santa Fe, NM 87501

Submitted via email: renewablewater@state.nm.us

Re: Oil and Natural Gas Produced Water Governance in the State of New Mexico – Draft White Paper

Clean Water Action appreciates the opportunity to comment on the joint draft white paper, *Oil and Natural Gas Produced Water Governance in the State of New Mexico,* developed by EPA and the State of New Mexico. Clean Water Action is a national organization working in fifteen states on a wide range of health and environmental challenges, with a particular focus on drinking water issues and on oil and gas activities.

More formal coordination between Region VI EPA and New Mexico regulatory agencies is a positive development. The white paper offers a legal and regulatory roadmap of several avenues for oil and gas wastewater management. This is important progress and may clear up confusion for operators in New Mexico. We commend EPA and the state for the work thus far and offer the following comments for improvement in the final version.

Final White Paper Must Include Review by Incoming Administration

The white paper is in its first round of public review and as such should not be finalized prematurely without the incoming administration's chance for review. Any potential reforms enacted as a result of this effort will likely be implemented by a new set of top decision-makers in the state and future iterations must include insight and analysis from the new leadership.

Data and Knowledge Gaps Must Be Identified Upfront

The white paper should more clearly identify and feature key data gaps that complicate the various scenarios outlined within. While the paper acknowledges gaps in understanding of produced water chemistry, analytical methods, and treatment, these aspects are core to each regulatory framework. In order to more honestly and clearly describe produced water management options, the white paper must thoroughly include these uncertainties in each scenario and outline the progress needed to fill these gaps. Moreover, "permitting-by-rule" as envisioned in the paper (p. 31) would necessitate significant advances in expertise if appropriate at all.

New Mexico State Land Office Excluded from Discussions – Why?

The State Land Office (SLO) was excluded from the consultation process. The exclusion in light of recent activity by the SLO is notable.

EPA highlights the agency's importance in the footnotes, "the SLO is responsible for administering nine million acres of surface and 13 million acres of subsurface estate for the beneficiaries of the state land trust, which includes schools, universities, hospitals and other important public institutions."

Yet, the SLO recently filed a lawsuit against the New Mexico Office of the State Engineer, Tom Blaine, for failing to protect the state's groundwater.[1] The SLO contends the State Engineer misappropriated "415 million gallons of water since 2010 by issuing multiple permits in one year to the same applicants," and that this is water which "was never intended to go to fracking."[2]

Correspondence between the SLO Commissioner and the State Engineer indicate that livestock water wells on state land were re-appropriated for commercial water sales to oil and gas companies, outside of any existing authority. State Land Commissioner wrote to the State Engineer explaining, "Several landowners along the Black River have reported to my staff that they regularly observe the river being dried up by subsurface diversions and nearby groundwater pumping to sell for bulk water use in hydraulic fracturing."[3]

Across the border in Texas, companies drilled wells into the Pecos Valley Aquifer and sold it back to oil and gas operators in Eddy County in New Mexico without any restrictions from state officials. Essentially taking water from the shared aquifer and selling it back to fracking operations.[4]

Given these developments, the final version of the paper should include recommendations from the State Land Office on how to best manage water resources within its authority in light the intensification of water usage by the oil and gas industry and increased production forecasts for the Permian Basin.[5]

Furthermore, we are concerned that other critical stakeholders have not been included in this process. This includes downstream users of impacted water bodies. This paper should not be finalized without input from the drinking water utility sector and those responsible for water management in New Mexico. The recreation industry and other business interests should also have meaningful input.

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[1] State of New Mexico, County of Santa Fe, First Judicial Court. "Petition for Alternative and Peremptory Writs of Mandamus." June 21, 2018. https://www.courthousenews.com/wp-content/uploads/2018/06/NM.Water_.pdf

[2] Boyd, Dan. "Land Commissioner sues NM top water official." *Albuquerque Journal.* June 22, 2018. https://www.abqjournal.com/1187999/land-commissioner-sues-nm-state-engineer-over-water-permits.html

[3] Letter from Aubrey Dunn, Commissioner, Office of State Land Office to State level . "RE: Endangered Species

[4] Weiser, Matt. "Oil Boom Southern New Mexico Ignites Water Feud With Texas." *Water Deeply.* July 16, 2018. https://www.newsdeeply.com/water/articles/2018/07/16/oil-boom-in-southern-new-mexico-ignites-groundwater-feud-with-texas

[5] The intensification of the water footprint of hydraulic fracturing. Andrew J. Kondash, Nancy E. Lauer, Aver Vengosh. *Science Advances.* 15 Aug 2018 : EAAR5982. http://advances.sciencemag.org/content/4/8/eaar5982. U.S. Geological Survey. "USGS Announces Largest Continuous Oil Assessment in Texas and New Mexico." November 28, 2018. https://www.usgs.gov/news/usgs-announces-largest-continuous-oil-assessment-texas-and-new-mexico?utm_source=news&utm_medium=email&utm_campaign=de-basin-2018.

Renewable Water PR Campaign

We have significant concern around the use of the term "renewable water." Creating a new category of water appears to be motivated by the desire to use a term seen at "positive" in order to build support for the use of produced water outside the oil field. However it does not appear to be based on any technical difference from other re-use of produced water. At best, this term is meaningless, but at worst it is misleading and inaccurate. Produced water is inherently *not* renewable, as groundwater that is present in oil producing zones is rarely recharged via natural processes. Furthermore its use would require significant treatment and associated energy use and the need to dispose of byproducts. In fact formation water is available only as a bi-product from producing inherently unrenewable and finite fossil fuel reserves. *Renewable water* sounds like a marketing campaign built around other two year old EPA terms like "back-to-basics" and "energy dominance." These are terms with no basis in the technical literature, but are often utilized for political purposes.

As an organization with a focus on drinking water, we are also concerned about blurring the public's understanding of public water systems, private wells, and drinking water issues. Public water systems are already working through immense challenges to effectively communicate risks to drinking water sources, increasing infrastructure costs including treatment, operations, and maintenance, and the need to be resilient to impacts of climate change. It is risky to embrace new quasi official terminology un-tethered from any real meaning in the water sector.

Public Concerns vs. Industry Concerns

The white paper outlines a myriad of legal ways the industry can manage and dispose of its waste if it chooses to navigate the regulatory process. The only limits are operational costs, not regulations. Most company business plans related to water usage and disposal are flawed when faced with the reality of water availability and costs of dealing with the 5x amount of often toxic wastewater created during extraction. This is why the industry is requesting changes to the regulatory framework instead of operating from inside the limits of the natural system they inhabit.

Industry's actual motives were telegraphed in the marketing materials for the recent "*New Mexico Produced Water Conference: Policy, Regulations, Economics to Support Total Resource Recovery"* in November 2018. Conference organizers explained: "The oil and gas industry in New Mexico is currently facing two major challenges associated with water management that threaten to limit future oil and gas activity in the state: acquiring fresh water for drilling and development of new wells: and management of produced water."[6]

The problem for industry is not the forecasts for prolonged and intense droughts in New Mexico, or the rate of population growth and associated drinking water needs, but instead the potential for curtailed access to fresh water needed to support "total resource recovery." New Mexico residents' lived experience with water scarcity is different than that of an oil and gas company, yet the two are conflated in the white paper. What is best for the public, in some cases, will not be what is best for an industry which depends on limitless water access for endless expansion.

[6]Kimberling, Christine. Email invite to "New Mexico Produced Water Conference: Policy, Regulations and Economics to Support Total Resource Recovery."

How acute are water availability concerns?

Analysis by CERES and the World Resource Institute (WRI) reported that a majority of wells in New Mexico are drilled in high or extremely high water stress regions. Extremely water stress, as defined by WRI, means "over 80 percent of available surface and groundwater is already allocated for municipal, industrial and agricultural uses."[7]

Overlaying U.S. Drought Monitor reports and New Mexico oil and gas plays is troubling in the context of water availability. Right now 95 percent of New Mexico is in drought. The recent National Climate Assessment regional report on the Southwest describes in detail the impacts that shifting precipitations patterns will have on the state. A water constrained future is coming. At the same time, oil production in NM soared by 30 percent last year.[8] As a result of evolving production techniques the state is now the third largest oil producer in the US. Over 600 wells are added each year to a massive inventory of over 26,000. But coaxing oil to the surface in some fracking operations requires an incredible 34 million gallons of water per well.[9]

Water use in the Permian Basin, which New Mexico shares with Texas, has already risen from more than 5 billion gallons in 2011 to almost 30 billion in 2016. IHS Markit, an international energy research firm, predicts water demand "will double by the end of this year, to 60 billion gallons, and more than triple by 2020, to almost 100 billion."[10]

According to the *New York Times,* parts of the Rio Grande River are running dry and spring runoff this year was one sixth of the average.[11] This creates a complicated situation for businesses and communities that depend on the river and could exacerbate tensions between larger water users in the state – namely agriculture and oil and gas.

In light of prolific water use by the oil industry, forecasts for historic increases in oil production, and the total water usage by New Mexico residents, what realistic impact can "streamlining" environmental protections have on water availability? What is the actual quantifiable plan for industry produced water in the state's future? Is this the most efficient and cheapest approach to addressing complicated and multilayered water concerns?

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[7] Freyman, Monika. "Hydraulic Fracturing and Water Stress: Water Demand by the Numbers." CERES. February 2014. https://www.ceres.org/news-center/press-releases/new-data-water-use-hydraulic-fracturing-key-risk-water-stressed-regions

[8] Schnieder, Keith. "Here's why New Mexico's oil boom is raising a lot of questions about water." *LA Times.* March 25, 2018. https://www.latimes.com/nation/la-na-new-mexico-permian-basin-20180325-story.html

[9] *Ibid.*

[10] Hunn, Dave. "Fracking Water Related issues Draw Attention in West Texas." *Houston Chronicle.* August 4, 2017. https://www.timesrecordnews.com/story/news/2017/08/04/fracking-related-water-issues-draw-attention-west-texas/539232001/

[11] Fountain, Henry. "In the warming west, the Rio Grande is drying up." *The New York Times.* May 24, 2018. https://www.nytimes.com/interactive/2018/05/24/climate/dry-rio-grande.html

Normalize Commonsense Limits to Industry Water Use

The Permian Basin is on track to produce more oil than most OPEC nations within the next five years.[12] This level of production is unprecedented and has geopolitical implications. It also comes with very real consequences at the local level that cannot be ignored. While overall water usage by the oil industry in New Mexico is often compared to other sectors at the state or national level, all water availability impacts are inherently local. CERES analysis of fracking and water use found that in the top 10 oil and gas counties, fracking water use rose to over 100 percent of the annual domestic water use for each county.[13]

In light of persistent drought conditions and shifting precipitation trends, EPA should work with New Mexico state agencies to develop new strategies to mitigate evolving water challenges. These policies should go beyond the industry's preferred route of loosening environmental protections in order to improve the extraction economics. Instead regulatory agencies should develop policies to bring oil and gas water usage back in line with disposal capacity and ecological limits. If operators are having problems with existing legal authorities and disposal options utilized for decades – that is an operations problem that should be solved in the boardroom, not by EPA.

It is past time to officially acknowledge that the mere existence of hydrocarbons does not demand they be extracted as quickly as possible, ad infinitum, regardless of water limits. In order to adequately protect public health and the environment, as is EPA's mission, the Agency must sidestep the default response to industry requests for help with a flawed business plan.

Start this process by including a section in the white paper on regulatory authorities to limit oil industry water use in times of drought and develop a long term strategy to bring oil production back in line with water reality. The following recommendations for transparency and data collection will go a long way in assessing future avenues for reform:

- Collect and disclose total water volumes used in each state shale play, from where water is being sourced, including projected future water needs, the security of sourcing options.
- Collect and disclose the percentage of water use in each region from non-freshwater sources, including a breakdown of present use and future use from recycling, brackish supplies and other non-potable water use, building on the water management schematic included in the white paper.
- Require operators disclose the percentage of revenues and future growth forecasts in regions with high water stress or areas with drought and groundwater challenges.[14]

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[12] Blum, Jordan."Permian will outpace all OPEC nations except Saudis." *Houston Chronicle.* June 14, 2018. https://www.houstonchronicle.com/business/energy/article/Permian-will-outpace-all-OPEC-nations-except-12995744.php

[13] Freyman, Monika. "Hydraulic Fracturing and Water Stress: Water Demand by the Numbers." CERES. February 2014. https://www.ceres.org/news-center/press-releases/new-data-water-use-hydraulic-fracturing-key-risk-water-stressed-regions

[14] Adapted from above CERES report designed as a "Shareholder, Lender & Operator Guide to Water Sourcing."

Conclusion

Clean Water Action appreciates the opportunity to comment and we look forward to participating in future rounds of public consultation. We hope our comments are clear that agencies must embark on the long journey to closing data gaps upfront and reducing uncertainly around what is actually contained in the billions of barrels of wastewater the oil and gas industry generates each year. Further, we believe it is reasonable to request that an analysis of oil and gas industry water acquisition and use be formally included in EPA and New Mexico's efforts to link the industry with solving water availability issues.

Respectfully submitted,

John Noël
National Oil & Gas Program Director
Clean Water Action
[redacted]

From: Stuart Siffring [redacted]
Sent: Monday, December 10, 2018 7:54 PM
To: water, renewable, EMNRD
Subject: Western Energy Alliance comments on EPA-NM Produced Water White Paper
Attachments: Western Energy Alliance Comments - EPA-NM Produced Water White Paper.pdf

Hello,

Attached are the comments on the EPA-NM Produced Water white paper from Western Energy Alliance. Thank you for the opportunity to comment on this collaboration.

-Stuart Siffring

Stuart Siffring, PE
Regulatory Analyst
Western Energy Alliance
[redacted]

WESTERN ENERGY ALLIANCE

December 10, 2018

Matthias Sayer
Deputy Secretary
New Mexico Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, NM 87505

James Kenney
Senior Policy Advisor for Oil and Natural Gas
United States Environmental Protection Agency
William Jefferson Clinton Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re: Public Comment on the Draft White Paper: Oil and Natural Gas Produced Water Governance in the State of New Mexico

To Whom it May Concern:

Western Energy Alliance appreciates EPA's and New Mexico's efforts to add clarity to the regulatory structure that exists for produced water from the oil and natural gas industry. With ever increasing volumes of water being produced from the state, it shows a great deal of foresight to begin the process of developing potential changes to the regulations that govern the use and disposal of this potential resource.

Western Energy Alliance represents over 300 companies engaged in all aspects of environmentally responsible exploration and production of oil and natural gas in the West. Alliance members are independents, the majority of which are small businesses with an average of fifteen employees.

The Alliance fully supports the effort to increase cooperation on particularly pressing environmental issues between EPA regions and states, it is a framework that we hope can propagate to other regions and states. This paper is a great example of how increased coordination can produce results that help inform stakeholders, allow for continued industrial activity, and remain protective of the environment.

There are a few points that we hope are addressed in the future final version of this white paper. In order to help incentivize re-use or recycling of produced water, a thorough examination of the rules on reporting accidental spills should be included in the paper. The paper is already a comprehensive overview of the regulations on surface water but including spill reporting section would be a welcome addition to any operator looking to this document as a "one stop shop" for all aspects of managing produced water.

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The other aspect we would like to see is a more in-depth discussion on how both state and federal rules apply to mobile water treatment units. The current lengthy permitting timeframes discourage mobile water treatment technologies from rapidly responding to localized drought conditions with surface discharge for wildlife, habitat, or agriculture uses. A rapid permitting mechanism available for temporary facilities could have a major impact on water quality or quantity issues that may arise unexpectedly.

Finally, since there seemed to be uncertainty with produced water compositions in the state, we would like to offer our assistance in gathering typical compositions by basin and formation which could be used to inform future rulemaking. Industry is already voluntarily sampling produced water and flowback water through the Frac Focus data repository, which has been a useful tool to inform the public and regulators alike on the actual composition of well fluids.

Thank you again for the opportunity to share our comments on this paper, we look forward to more constructive meetings between your agencies in the future.

Sincerely,

Stuart Siffring, PE
Regulatory Analyst

From: [redacted]
Sent: Monday, December 10, 2018 8:04 PM
To: water, renewable, EMNRD
Subject: Draft Comments for New Mexico Assn of Conservation Districts NMACD
Attachments: Draft Comments for NMACD.docx

Attached are the draft comments for the New Mexico Association of Conservation Districts.
Thank you.

Debbie Hughes
[redacted]

NEW MEXICO ASSOCIATION OF CONSERVATION DISTRICTS (NMACD)

163 Trail Canyon Road
Carlsbad, NM 88220

December 10, 2018

Energy, Mineral, and Natural Resources Dept. *via email: renewablewater@state.nm.us*
c/o OFS/MOU
1220 S St. Francis Drive
Santa Fe, NM 87501

The New Mexico Association of Conservation Districts appreciates the opportunity to review and comment on the "Oil and Natural Gas Produced Water Governance in the State of New Mexico – Draft White Paper". In addition, I sponsored and attended the November forum on this topic hosted by New Mexico in Santa Fe. The forum was very helpful in gaining perspective on current technology, regulation, economics and industry information to help us address the Draft White Paper.

The New Mexico Association of Conservation District (NMACD) facilitates the conservation of the Natural Resources in New Mexico by providing opportunities and quality support to local conservation districts and partnerships through representation and leadership. Sustainable working landscapes and healthy economies go hand-in-hand. Our soil and water conservation districts work to conserve healthy soils and healthy watersheds on lands throughout the state. We believe that State leadership and guidance regarding treatment, reuse and recycling of produced water is critical for New Mexico's agricultural, environmental and economic future.

The State and Federal agencies that worked on the Draft White Paper did a comprehensive and tremendous job of articulating regulatory responsibilities and the options that you see available to the state for consideration. In particular, we very much like the approach and thought you used in the development of Section 3: Improving the Quantity and Quality of Water in New Mexico. Any and all efforts that continue to build the collaboration not only between OCD, OSE EPA and NMED but other state and federal agencies will be critical in yielding the best possible outcomes for New Mexico. We also agree that a next logical step is outreach to landowners, groups, organizations and citizens throughout New Mexico. In addition, NMACD would welcome the opportunity to be an advisor or participant in any of the collaborative forums you may use now and into the future.

The produced water forum clearly highlighted the situation New Mexico now faces in how it will sustain viable agriculture, community use and the oil and gas industry while assuring fresh water supplies for current and future use within the state. NM has the least amount of water (4 million AF) to administer than any other state in the US and is also the 5th driest state in the nation averaging 14" of moisture annually.

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It takes about 90 AF of water to drill, frack and develop a well today versus the average of 10 AF it took just a decade ago. Technology in fracking and horizontal drilling has created huge leaps in production capability, dramatic reduction in surface disturbance, significant increases in oil and gas production costs, disposal, infrastructure, use of fresh water and resulting produced water of nearly 2.5 million barrels a day (105 million gallons) and growing.

Experts at the forum cited that today, New Mexico oil and gas production produces about 4.75 barrels of produced water for every barrel of oil. This equates to 120,000 AF of produced water annually which nearly matches the average annual flow of 150,000 AF for the New Mexico portion of the Pecos River. However, New Mexico only treated and reused about 8% of its produced water in 2018.

Recommendations:

Initial regulations and policies should continue to focus on Re-Use/Recycle Water within the Oil and Natural Gas Industry until secure markets for by-products are established and mechanisms are in place to assure the health and safety of our citizens, agricultural industry and natural resources.

As landowners, ranchers and farmers our first choice would be to avoid use of fresh water for oil and gas development. We also believe that continued use of fresh water for oil and gas development in the Permian is not sustainable and will lead to a series of dire long term consequences for our rural economies and land health if it continues at this rate. The significant need for fresh water use in oil and gas production is leading to agricultural producers to cease farming and ranching as water rights are purchased and/or moved to other areas for oil and gas production. This is rapidly changing the demography, culture and rural economies of Eddy and Lea counties. If this trend continues, riparian and upland health will degrade and native species tied to these ecosystems may face population declines and potential Endangered Species Act (ESA) petitions and listings. The long term impacts will be felt most as industry eventually cycles out of the basin. Waters geographically tied to farming will have been transferred away from valuable agricultural lands to sites that do not or should not be farmed. In addition, fresh water wells historically used for livestock or homestead use may well be played out due to pumping for oil and gas production. To change this course New Mexico should prioritize rapidly moving from the use of fresh water to reuse of produced water for oil and gas operations.

The average total dissolved solids (TDS) in the New Mexico Permian Basin is 90,000 PPM. It was stated that this amount of salt produced daily equals a football field 10 ft. high. We understand the technology exists to treat, recycle and reuse the water at a cost between 50 cents and $4 but the upper end of these costs, readily push the economics of treatment out of reach. We also learned that costs will vary depending upon the ability to use onsite energy sources,

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such as natural gas, to run the facilities, sell by products post treatment and the initial upfront cost of facility construction. There may well be some niche markets for heavy metals or unique chemical extractions from our produced water but there are currently no global markets to use the significant amount of salts New Mexico produced water yields. As the experts pointed out, the city of El Paso has the biggest desalination plant in the US and can process 25 million gallons/day. New Mexico would need 3 or 4 plants to process what we produce in a day.

There were very salient points made in the forum that New Mexico should focus on "what works now". One example highlighted that there is 200 miles of pipeline for water transport in the ground now and in a year it will double. This infrastructure provides a closed loop system to and from central treatment and production facilities. This would lessen pressures on use of fresh water by blending fresh with treated produced water. It seems to be cost effective if they aggregate sufficient volumes to provide water supply demand, minimize disposal and minimize fresh water use within the industry sector. Technology is also available that can be placed on location performing produced water treatment and reuse opportunities for a smaller group of wells with the added feature of being mobile with minimal infrastructure requirements and costs. Which type of treatment facility to be used would be dependent upon each companies planning and cost estimates.

As more produced water is treated, the concentrated waste products from treatment facilities such as heavy brines may likely shift to surface disposal in pits vs. salt water disposal wells. Has there been any research to date that would consider the feasibility, pros and cons of concentrated waste disposal above or below surface?

We believe the amount of disposal could be significantly reduced as the rate of water treatment and reuse increases. If we doubled the amount of produced water that was treated and reused by industry each year, we would significantly reduce fresh water use and salt water disposal and could be much closer to 100% reuse of produced water for industry within a 4 year period. We are aware that regulatory mechanisms, under the produced water rule 34, are in place in New Mexico to help accomplish this goal.

It might also be helpful to consider streamlining the permitting requirements through the Office of the State Engineer for the large water impoundments necessary for holding significant amounts of water that would be available for treatment and reuse. Proper engineering for each site is important but it is currently a slow and difficult process.

We also agree with the draft white paper that additional regulatory and policy incentives should be explored with stakeholders and policymakers that aggressively encourage additional re-use of produced water and treated produced water, both within the oil and natural gas industry and within other industries.

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Continue research between EPA and New Mexico that focuses on the entire life cycle of water production, treatment and reuse outside of oil and gas operations to assure the health and safety of the citizens of New Mexico and its agricultural industry and natural resources now and into the future.

During the forum it was stated that EPA started a study in 2017 with industry about produced water with a draft scheduled to be out in the first quarter of 2019. NMACD believes this is an important step toward understanding what produced water consists of and what the potential effects of treatment and by products may be to human health and the environment. This would also help develop policies or regulations that will address any risks for landowners, agricultural community and citizens who will be vital for support of additional use of treated water outside oil and gas production.

As an example, some areas in Colorado have desalinated produced water using evaporation technology. In this example, misters and water cannons were used to hasten the evaporative process. Two unanticipated issues surfaced. The misting process was emitting toxic chemicals into the air which were carried by wind into local communities and settled out on lands outside the treatment facility. The other issue was the presence of biocides in the water which meant the ponds were not able to be reclaimed since these chemicals preclude plant growth. As a result, the area generated toxic dust that was carried by the wind contaminating other locations off site. These types of residual effects need to be included in studies to assure that treatment techniques employed do not create unanticipated or residual effects to the humans, agriculture and our natural resource environment.

This is particularly true for New Mexico as there are so many different chemical compositions of water in the various Permian formations. In addition, each energy company has different chemical formulas they use during their fracking operations. These waters become a complicated mixture of naturally occurring and artificially added chemicals that would not be discernible until tested at a treatment facility. In addition to your interests in a greater scientific understanding of the constituents in produced water, the development of analytical methods, and the treatment effectiveness for broad groups of chemical compounds found in our produced water we also suggest that it would be prudent to conduct pilot studies. For example, it would be valuable to compare and examine a central produced water gathering, treatment and reuse facility with a smaller more mobile treatment facility on a production location to better understand their differences, the risks associated with them and which ones would be most cost effective and safe.

We should also continue the ongoing work of the integrated decision support tool developed by New Mexico State University to be expanded and accelerated for the Permian Basin with State

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and industry assistance in providing quality data. Building a comprehensive data base will continue to enhance the various treatment technologies and corresponding expected results for those treatments.

Develop a process that would allow treated water to an Agricultural Use level that could be piloted and tested on reclamation sites prior to shifting to agricultural use.

Many landowners and agricultural producers in New Mexico see the opportunity and benefit of treated water for use by livestock, farming and rangeland enhancements. The forum highlighted numerous examples outside New Mexico where treated water was put to surface use safely and with good monitoring. Another example exists in SE Colorado within the coalbed methane fields. These were typically shallow oil and gas wells with higher quality water than what we experience in SE New Mexico. However, the energy company worked very closely with local landowners and agricultural producers to treat the produced water for agricultural surface reuse for nearly 20 years. They conducted thousands of hours of real time testing and monitoring with EPA and others and demonstrated that treatment and reuse for agricultural use was very successful and done could be done economically.

Given SE New Mexico produced water is much different than the example highlighted above, it would be valuable to pilot a lower level of risk for treatment and reuse of water for reclamation purposes as a precursor for future broader agricultural use. The concept would include treating the water to meet a standard for agricultural use but test it on reclamation sites. This could be a potential partnership between State and Federal agencies, oil and gas industry and a water treatment company. You describe the regulatory process very well in the "Agricultural Uses" section of the Draft White Paper. A question that remains is whether the current water standards for agricultural address new chemical compounds that may now exist that the standards had not previously considered. If not, who would be responsible for updating those standards for use in treatment compliance?

Ensure that Industrial Use/Commercial Sales outside the Oil and Natural Gas Industry benefit the state of New Mexico, its citizens, producers and natural resources.

NMACD agrees with the draft white paper that there is a significant challenge and opportunity to clarify the responsibility and control of treated produced water to facilitate broader re-use outside oil and natural gas operations. As landowners and producers, we have many questions about what regulatory mechanisms are needed for the state to retain ownership of treated water and a landowner's ability to obtain a water right for the treated water. As current fresh water levels are depleted within the Permian Basin and water rights are transferred to new locations or the water source for the right is depleted, treated water will become increasingly valuable. As a citizen and landowner that may have a water right, we see value in supplementing this potential fresh water

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loss through the use of treated produced water. We can also foresee if regulations are not developed to prioritize the treated produced water for use in New Mexico that the treated water could be sold to the highest bidder in another state.

It would be valuable to establish a team with a cross section of current water right owners, NGO's and agency personnel to develop these regulatory mechanisms along with what marketing opportunities in state might be available for those water right holders.

Thank you again for you leadership and vision in this arena. Taking this inclusive and collaborative approach with ensure a better future for all of New Mexico.

Debbie Hughes

Debbie Hughes
Executive Director

From: wyrd magi [redacted]
Sent: Monday, December 10, 2018 8:20 PM
To: water, renewable, EMNRD
Subject: fracking waste water proposal

Hello my name is Anya Acton,
I am a New Mexico resident and I oppose the new fracking waste water proposal, and oppose treated fracking waste water being used for household, municipal agricultural purposes in the state of new mexico.

Thank You

From: Nancy Villanueva [redacted]
Sent: Monday, December 10, 2018 9:26 PM
To: water, renewable, EMNRD
Subject: Please say NO to Fracking Wastewater Proposal

I am concerned about the Fracking Wastewater Proposal which includes using the treated wastewater for agricultural and municipal purposes. Please say NO to this proposal.

Thank you,

Nancy Villanueva

From: templetm2 [redacted]
Sent: Monday, December 10, 2018 11:58 PM
To: water, renewable, EMNRD
Subject: FRACKING WASTEWATER PROPOSAL

Supporting an incredibly irresponsible activity (fracking) by creating highly questionable options for waste handling that could further damage our environment and life support systems is unacceptable. DON'T DO IT!!

Moss Templeton
[redacted]

Sent from my Verizon, Samsung Galaxy smartphone

From: Sarita José [redacted]
Sent: Tuesday, December 11, 2018 2:03 AM
To: water, renewable, EMNRD
Subject: Fracking Watermelon Proposal

Please don't subject innocent people, animals, and Mother Earth to the effects of Franklin in the Greater Chaco Area. Please hear the concerns of the people living there and don't allow harmful fracking and consequences of cracking to take place in that area.

Sarita Yazzie

From: Aaron Mintzes [redacted]
Sent: Thursday, December 20, 2018 7:36 AM
To: Kenney, James [redacted]
Cc: Bruce Baizel [redacted]; Melissa Troutman [redacted]
Subject: Earthworks comments re: EPA/NM produced water Draft White Paper

Dear Jim,

My apologies for tardiness. We wanted to sift through some of the new WOTUS proposal thinking it might impact the Draft White Paper's recommendations.

Please accept our comments and appreciation for a grace period on submitting them. I thank you in advance and wish you happy holidays.

Warm regards,
Aaron

=== EARTHWORKS: Protecting Communities and the Environment

Aaron Mintzes
Senior Policy Counsel, Earthworks
[redacted]

CFC# 41290

EARTHWORKS

December 20, 2018

Earthworks Comments on the New Mexico's and the Environmental Protection Agency's (EPA) *Oil and Natural Gas Produced Water Governance in the State of New Mexico- Draft White Paper*

Thank you for the opportunity to provide comments on New Mexico's and Environmental Protection Agency's (EPA) *Oil and Natural Gas Produced Water Governance in the State of New Mexico- Draft White Paper* ("Draft White Paper" or "The Draft").

Please accept these comments on behalf of Earthworks, a national nonprofit organization dedicated to protecting communities and the environment from the impacts of energy development while seeking a managed decline from fossil fuels and sustainable solutions.

Allow Science to Drive Policy

One strong point of consensus emerging from this Draft White Paper and the October 9 public hearing EPA hosted in Washington, D.C., is that policy proposals should flow from science. The scientific community, many state regulators, and the conservation community all agree: only after learning what produced water contains, can we then develop policies to regulate it. Otherwise, New Mexico, EPA, and the public operate in a knowledge vacuum and changes designed to maximize dwindling water resources may prove ineffective and perilous.

Until regulators require full disclosure of all drilling and fracking additives and full chemical analyses conducted on all constituents, Earthworks believes it is premature for either New Mexico or EPA to consider any of the following:

- National Pollution Discharge Elimination System (NPDES) permits for produced water
- Rollback of EPA's Effluent Limitation Guidelines (ELGs) for discharges to Publicly Owned Treatment Works (POTWs)
- New Mexico Environment Department (NMED) Groundwater Discharge Permits for agricultural, irrigation, or other uses.
- Any NMED permits allowing treated produced water for potable use

Addressing Data Gaps Through Appropriate Safeguards

This Draft White Paper's description covering many of the agency links along the produced water chain underscores the incredibly hefty regulatory lift needed to execute plans to, for example, convert produced water into drinking water. We also note the conspicuous absence of the role of New Mexico's State Land Office (SLO).

Dedicated to protecting communities and the environment from the adverse impacts of mineral and energy development while promoting sustainable solutions.

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For potable uses, NMED's Drinking Water Bureau has no mechanism for testing contaminants from produced water sources. Nor do they have specific Safe Drinking Water Act (SDWA) regulations that address the use of treated produced water. Voluntary sampling programs will not suffice.

For NPDES permits, developing Water Quality Based Effluent Limitations (WQBELs) is a time intensive, permit specific exercise. The science needed to establish these WQBELs and other effluent limitations will necessarily come from, among other sources, characterizing produced water and disclosing fluid additives.

This Draft White Paper also discusses several underground injection options, including SDWA Underground Injection Control (UIC) Class II disposal. The Draft notes:

Ensuring proper characterization of materials entering produced water treatment/recycling facilities is important as RCRA hazardous wastes are not permitted in Class II injection wells.

EPA is also under a consent decree to determine whether to propose solid waste rules (pursuant to RCRA Subtitle D) for oil and gas produced water by March 2019. Narrowly tailored oil and gas solid waste rules could potentially benefit the proper characterization of New Mexico's produced water, benefitting decision making on available disposal options.

For these reasons, EPA and New Mexico should require information disclosing additives and characterizing produced water waste streams before considering all options. This is the thrust behind this Draft's sixth recommendation for improving the regulatory landscape.

Dirty Water Rule

On December 11, EPA published a proposed rule limiting Clean Water Act jurisdiction for many of New Mexico's waters.[i] If finalized, this rule could drastically impact EPA's NPDES program in New Mexico as well as this Draft's third recommendation for New Mexico to pursue NPDES primacy.

According to Amigos Bravos, the majority of New Mexico's wetlands would lose Clean Water Act protection under EPA's proposal.[ii] Ephemeral streams would lose their protection and intermittent streams appear likely to lose protections as well. This regulatory uncertainty does not well serve any of our interests in solving the problems of produced water.

New Mexico should inventory waters of the state- intermittent streams, ephemeral streams, and wetlands- to determine which waters the Dirty Water Rule jeopardizes. If finalized, the Dirty Water Rule could impose an enormous regulatory burden upon New

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Mexico effectively forcing the state to solve many of these produced water scientific, technical, and engineering challenges with little or no EPA support.

We also object to the Draft White Paper's definition of Recycled Water:

> *...any water that is generated from an oil or natural gas well, undergoes significant treatment, and is used again in an oil or natural gas well before disposal in an underground injection well.*

No water destined for underground injection, regardless of treatment level, should be considered recycled. This water is permanently removed from the hydrologic cycle.

Conclusion

Earthworks recognizes the discussions and scenarios in this Draft White Paper are preliminary. We urge EPA and New Mexico to exercise caution in pursuit of these preliminary options in light of the enormous gaps in science and safeguards that need filling. Moreover, EPA and New Mexico should remain mindful of proposed rules that may obviate, overtake, or fundamentally change core topics and recommendations this Draft discusses.

We look forward to working with both EPA and New Mexico in developing some of the ideas discussed. We appreciate the opportunity to provide our input.

Dedicated to protecting communities and the environment from the adverse impacts of mineral and energy development while promoting sustainable solutions.

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[i] https://www.epa.gov/sites/production/files/2018-12/documents/wotus_2040-af75_nprm_frn_2018-12-11_prepublication2_1.pdf?eType=EmailBlastContent&eId=13497754-c0ff-421a-9b9c-bfbf84a17e25

[ii] http://nmpoliticalreport.com/2018/12/13/revised-clean-water-rule-leaves-out-most-of-nms-waterways/