New Mexico Environment Department
Ground Water Quality Bureau

Produced Water Pilot Project Notice of Intent to Discharge

For Department Use Only:

Agency Interest Number_____
PRD Assigned _____

1. **Name and mailing address of person or group performing research (Responsible Person):**

Narendra Boppana
Stochastic Research Technologies LLC
2714 Crystal Way, Crystal Lake, IL 60012

Work Phone:
Cell/Home Phone:
Fax:
Email:

2. **Name and position of person completing form:**

Dr. Urmila Diwekar
Stochastic Research Technologies LLC
2714 Crystal Way, Crystal Lake, IL 60012

Work Phone: (630)886-3047
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Fax:
Email: urmila@vri-custom.org

3. **Research Focus (PWRC Research Category):**
Stochastic Research Technologies LLC is a startup working on an NSF-funded SBIR project entitled "SBIR Phase II: Novel Adsorbents for Selective Removal of Naturally Occurring Radionuclide Materials (NORM) from Fracking-Produced Water." We have tested our adsorbents for NORM in the laboratory and found that the adsorbents are very effective in removing NORM. This is our first pilot test for these adsorbents.

4. **Is the proposed use of the treated produced water to be used inside or outside of the oil and gas industry?**
In this project, there will be no use for treated water produced inside or outside of the oil and gas industry. Based on the experimental design and the performance of our adsorbents, the treated produced water will be disposed of following the NWPWRC and BGNDRF's regulations. For this test, there will be no discharge of the produced water. The distillate will be collected in a holding tank for sampling before being blended back with the concentrated brine for reinjection into the SWD.

5. **Does the location for testing the technology take place inside or outside of the oil and gas field? _**
It will take place outside of the oil and gas field. The testing will be conducted within the Brackish Groundwater National Desalination Research Facility (BGNDRF) campus.

6. **Physical location of the research site including size and boundaries of site (include, street address, township, range, section, county, distance from closest town or landmark, directions to facility. Provide as an attachment.**

The testing will be conducted within the BGNDRF's campus. The address is 500 Lavelle Rd, Alamogordo, NM 88301

7. Topographic and aerial map(s) showing:
• land status and adjacent land status
• 100-year flood plain,
• dwellings and occupied establishments,
• watercourses including irrigation ditches, wetlands, lakes, karst and soils
• water wells (types) or springs
• site security
• site plan showing locations of relevant structures

Shown below is the aerial photo acquired from BGNDRF (i.e., the testing site host).



8. List any regulatory, governmental and non-governmental agencies, including municipalities or counties
that have authority on the testing location. Provide as an attachment.
(a). The Brackish Groundwater National Desalination Research Facility, 500 Lavelle Rd, Alamogordo, NM 88310.
(b). New Mexico Produced Water Research Consortium, 1025 Stewart St. Engineering Complex 1, Las Cruces, NM
88003

9. Provide a description of your signage plan for the testing site. Provide as an attachment.

The testing site is within the BGNDRF facility. Managed by the Bureau of Reclamation, BGNDRF has been hosting the testing of produced water treatment systems at bench and pilot scales. It is worth noting that NMPWRC has constructed a few produced water storage and disposal tanks at BGNDRF, and we have obtained their permission to use them for this project. We also got confirmation from Dr. Mike Hightower that those tanks already have their own secondary containments, and they have already been evaluated by NMED.

10. Provide a description of your site security plan, including training and site restriction methods.

Stochastic will send at least one senior research scientist to BGNDRF, who will be well-trained to conduct testing, operate the system, and follow the EHS regulations.

11. List of adjacent landowners and confirmation that adjacent landowners have been notified of the proposed pilot project. Provide as an attachment.

N/A.

12. List the source(s) of the produced water including basin of origin. Describe how the produced water will be transported to and from the site including origin and disposal locations and onsite storage safety precautionary methods. Provide as an attachment.

The produced water will be acquired from NMPWRC. The transportation and disposal of produced water be done by following the regulations from NMED, NMPWRC, and BGNDRF. It is worth noting that NMPWRC has constructed a few produced water storage and disposal tanks at BGNDRF, and we have obtained their permission to use them for this project. We also got confirmation from Dr. Mike Hightower that those tanks already have their secondary containments, and they have already been evaluated by NMED.

13. Provide the disposal and decommissioning plan for the expected byproducts, waste products and other potentially contaminated materials. Plan should include disposition of equipment, soils, plants and piping requiring disposal and the expected disposal locations for each. Provide as an attachment.

Water: All water will be disposed of based on NMED, BGNDRF, and NMPWRC requirements. All water will be recombined with residue and be disposed of by SWD injection. The residuals will be collected in radioactive waste bins and taken to an approved nuclear waste disposal site by trained Stochastic personnel.

Soil: We do not expect to generate any contaminated soil. In case there is any, the contaminated soil will be disposed based on the requirements from BGNDRF and NMPWRC.

14. Describe all components of the produced water processing, treatment, storage, secondary containment, and produced water system (e.g., pre-treatment units, above ground storage tanks, etc.). Include sizes, site layout map, closed loop processing plans, and specifications. Provide as an attachment.

The untreated produced water will have the following expected water characteristics: a TDS of 30,000 ~ 120,000 PPM, a pH near 7, a residue oil concentration less than 2 PPM, and a close to zero TSS concentration. The detailed chemical composition and concentration is unknown.

15. Describe your disposal plan for all produced water, treated produced water, permeate or brine concentrate into a SWD. Provide as an attachment.

All water will be disposed of based on the requirements from NMED, BGNDRF, and NMPWRC. All water will be recombined with residue and be disposed of by SWD injection. The residuals will be collected in radioactive waste bins and taken to an approved nuclear waste disposal site by trained Stochastic personnel.

The treatment process we envision is shown in Figure 1. There is a mixing tank with stirrer where the water will be treated using a batch process. The residue is collected at the bottom and filtered. The treated water is taken for testing.

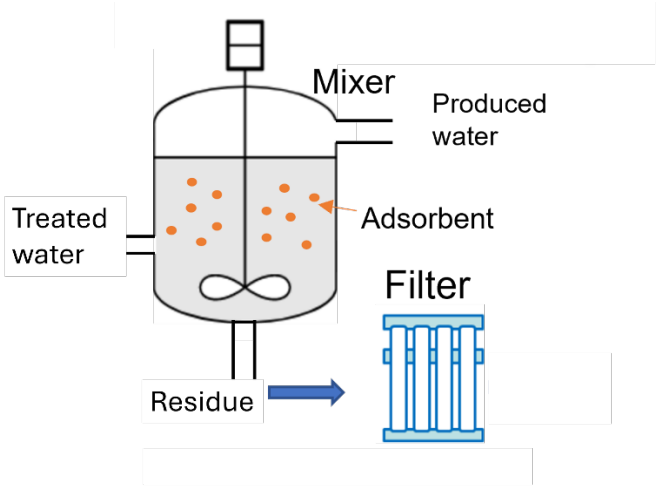


Figure 1: Schematic of Pilot System

The pilot project is expected to operate for up '10' weeks, treating up to '4' bbls/day of produced water. The treatment is expected to remove NORM levels to 30 pCi/liter (groundwater acceptable limit).

16. Describe your final closure plan after completion of the pilot project. Provide as an attachment. Estimated depth to ground water (ft): Source of information Direction of groundwater flow: Source of information

For this test, there will be no discharge of the produced water. The distillate will be collected in a holding tank for sampling before being blended back with the concentrated brine for reinjection into the SWD. For the treated and untreated produced water as well as the brine and permeate, it is worth noting that NMPWRC has constructed a few produced water storage and disposal tanks at BGNDRF, and we have obtained their permission to use them for this project to dispose of the aforementioned types of water. We also got the confirmation from Dr. Mike Hightower that those tanks already have their own secondary containments, and they have already been evaluated by NMED.

17. Describe your final closure plan after completion of the pilot project. Provide as an attachment. The decommission of the system will follow the regulations of BGNDRF and NMPWRC. The summary of deposal and decommission plan is as follows:

- Equipment: N/A – After the test is done, we will ship the equipment back to Houston or deploy it for more tests at
other sites.
- Material: Secondary containment will be reused; other expendables of the treatment system will be disposed of based on the requirements from BGNDRF and NMPWRC
- Water: All water will be disposed of based on the requirements from BGNDRF and NMPWRC.
- Soil: We do not expect to generate any contaminated soil. In case there is any, the contaminated soil will be disposed of based on the requirements from BGNDRF and NMPWRC.

The residuals will be collected in radioactive waste bins and taken to an approved nuclear waste disposal site by trained Stochastic personnel.

18. Estimated depth to ground water (ft): Source of information Direction of groundwater flow: Source of information

N/A. This project will not involve the use of groundwater.

19. Current Total Dissolved Solids Concentration in Groundwater

N/A. This project will not involve the use of groundwater.

Signature: _____ **Date:** April 25, 2025

Printed name: Dr. Urmila Diwekar **Title:** President

Certification by the Responsible Person

I, Urmila Diwekar, certify that the information and data submitted in this application are true and accurate to the best of my knowledge, professional expertise, and experience.

Signed this on Apr 25 2025 **upon my oath or affirmation, before a notary of the State of Illinois**

Maria Guadalupe Moreno

Official Seal
MARIA GUADALUPE MORENO
Notary Public, State of Illinois
Commission No. 981912
My Commission Expires November 27, 2027

Please return this form to:
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