Produced Water Characterization Across the Permian Basin: Emerging Findings from the Texas Produced Water Consortium

June 10, 2026

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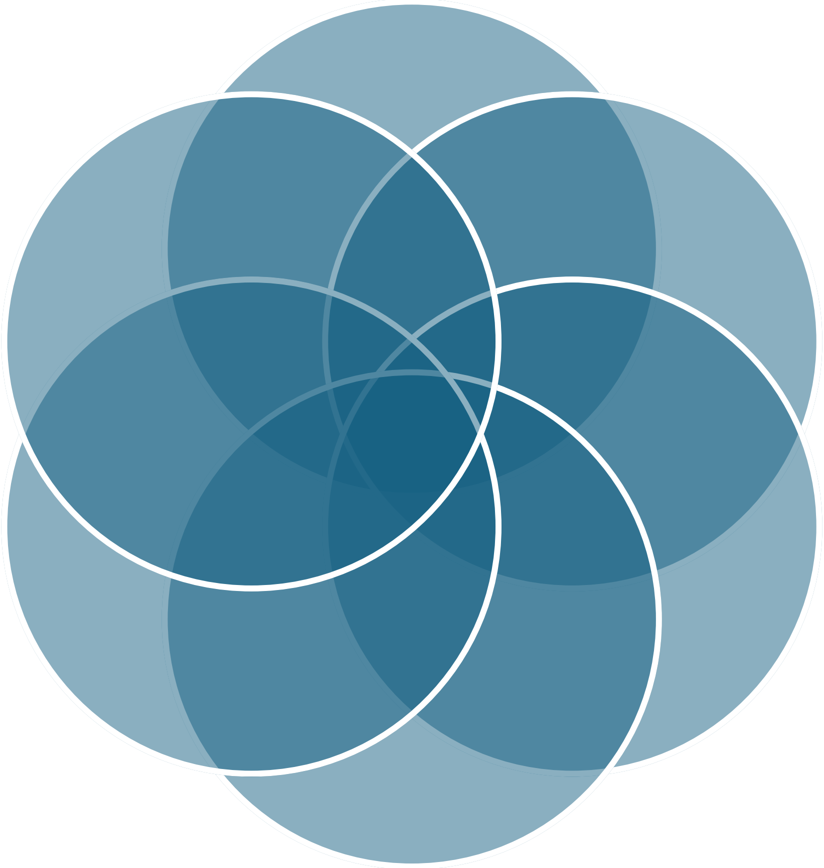

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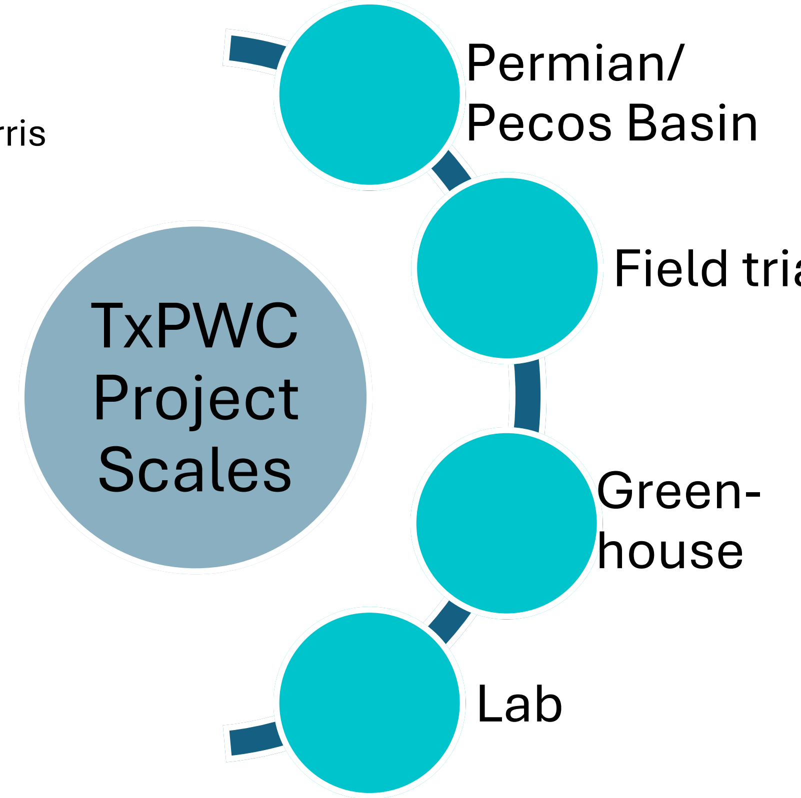

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Water and the Environment Research (WATER) Center

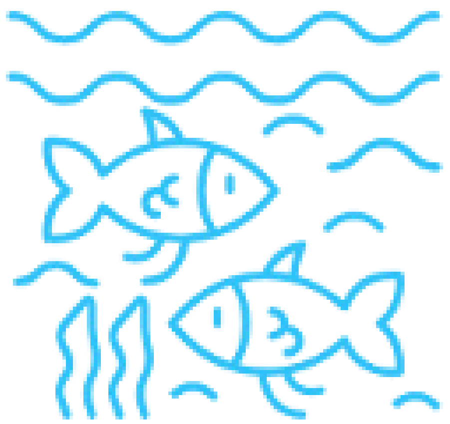
Texas Produced Water Consortium

Surface Discharge

Monitor ecological responses of aquatic and terrestrial organisms to changes in water quantity and quality along the Pecos River. Build and calibrate hydrologic models to simulate how water flows through river and groundwater systems to evaluate different management scenarios and understand the impacts on water quantity and quality.

Food Web Monitoring.

Ecological monitoring to track changes in the Pecos River food web in response to increased flows and reduced salinity.

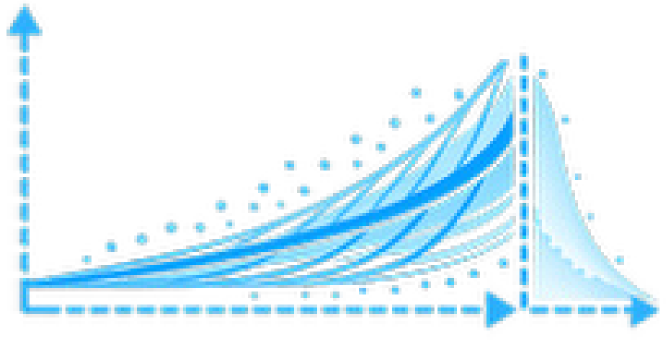


Ecological & Hydrologic Modeling

Ecological and hydrological data modeling to examine how changes in water quality and quantity will alter the productivity of the Pecos River and watershed.

Scenario Analysis.

Evaluating in-stream and land application scenarios to understand impacts on streamflow, groundwater systems, and salinity under different management and climate conditions.



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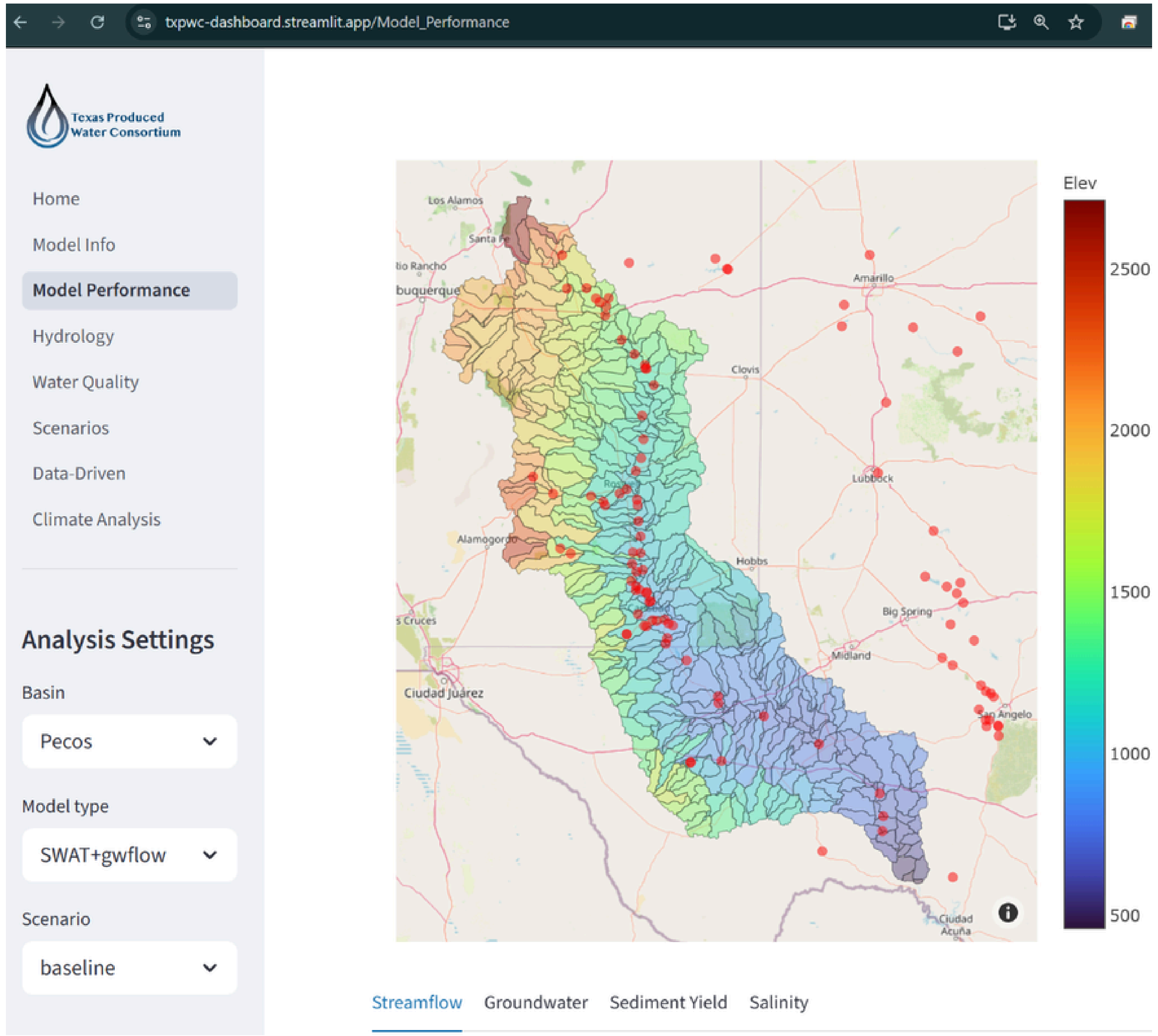
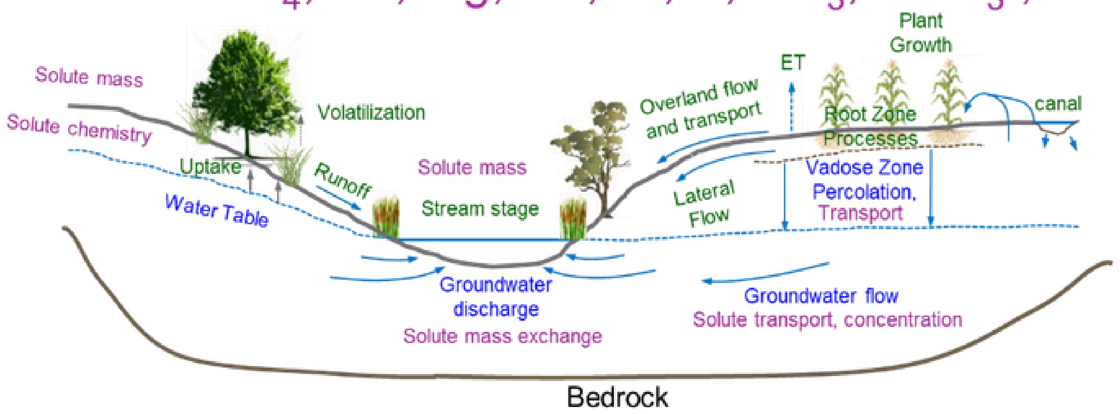
Surface Discharge



Method: Enhanced SWAT+ (Salt and river dynamics) *gwflow*

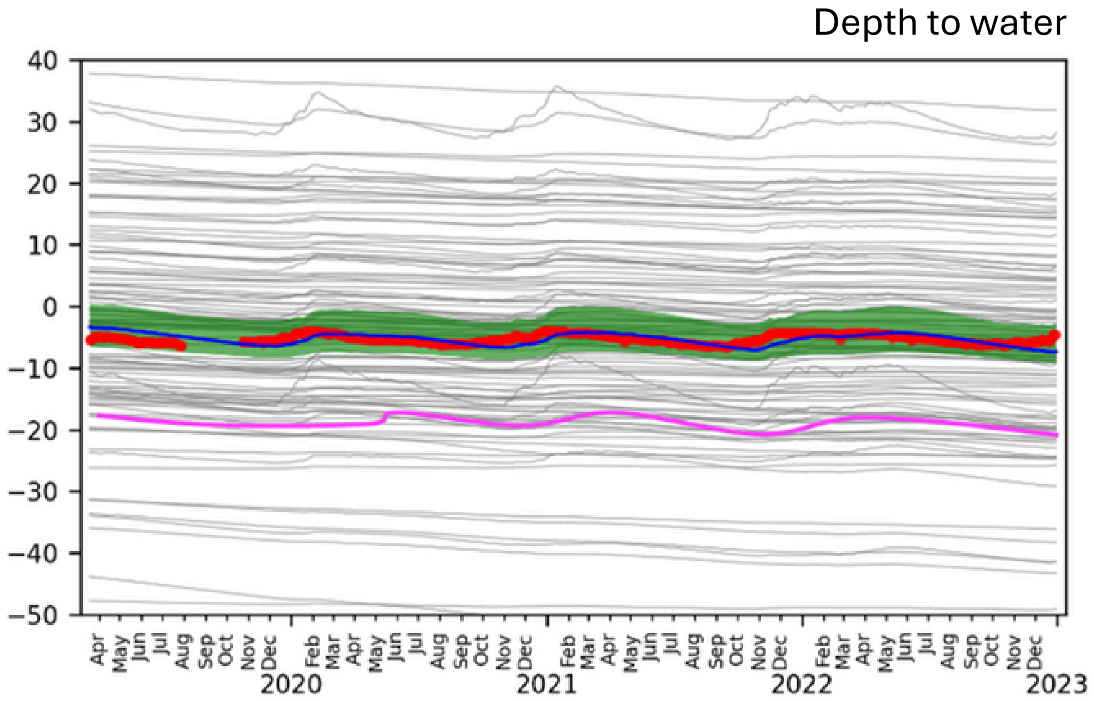
Watershed Solute transport in Enhanced SWAT+*gwflow* (Bailey at al., 2020)

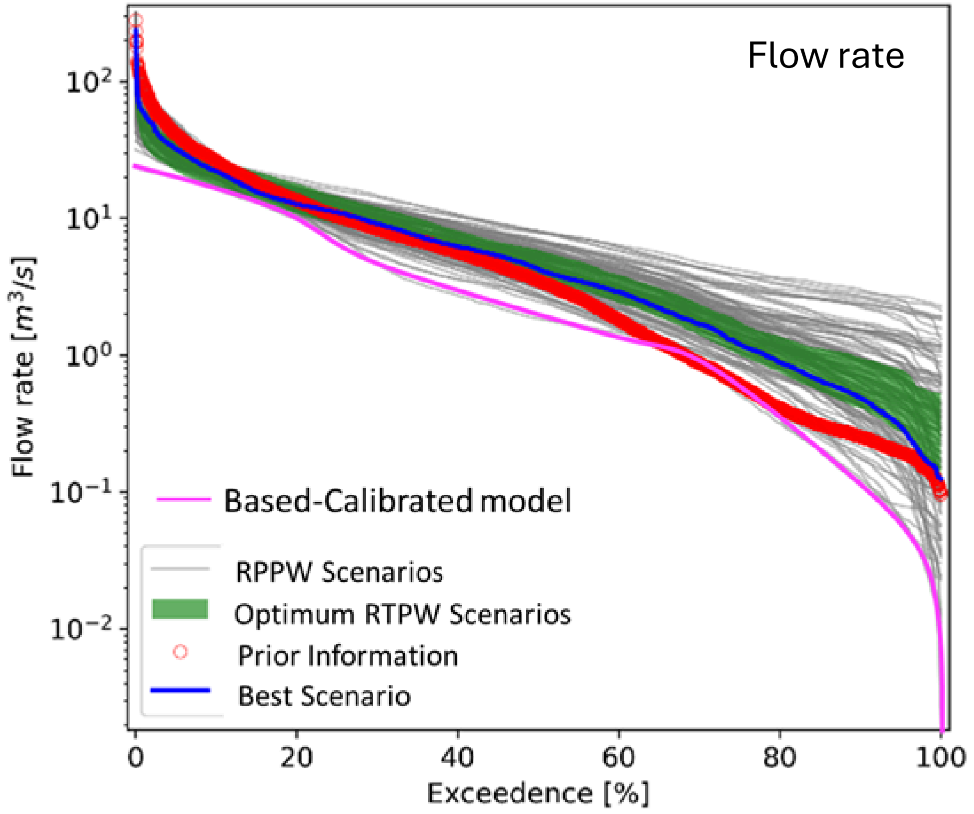
Solute = SO_4, Ca, Mg, Na, Cl, K, CO_3, HCO_3 , NO_3, P, NH_4^+



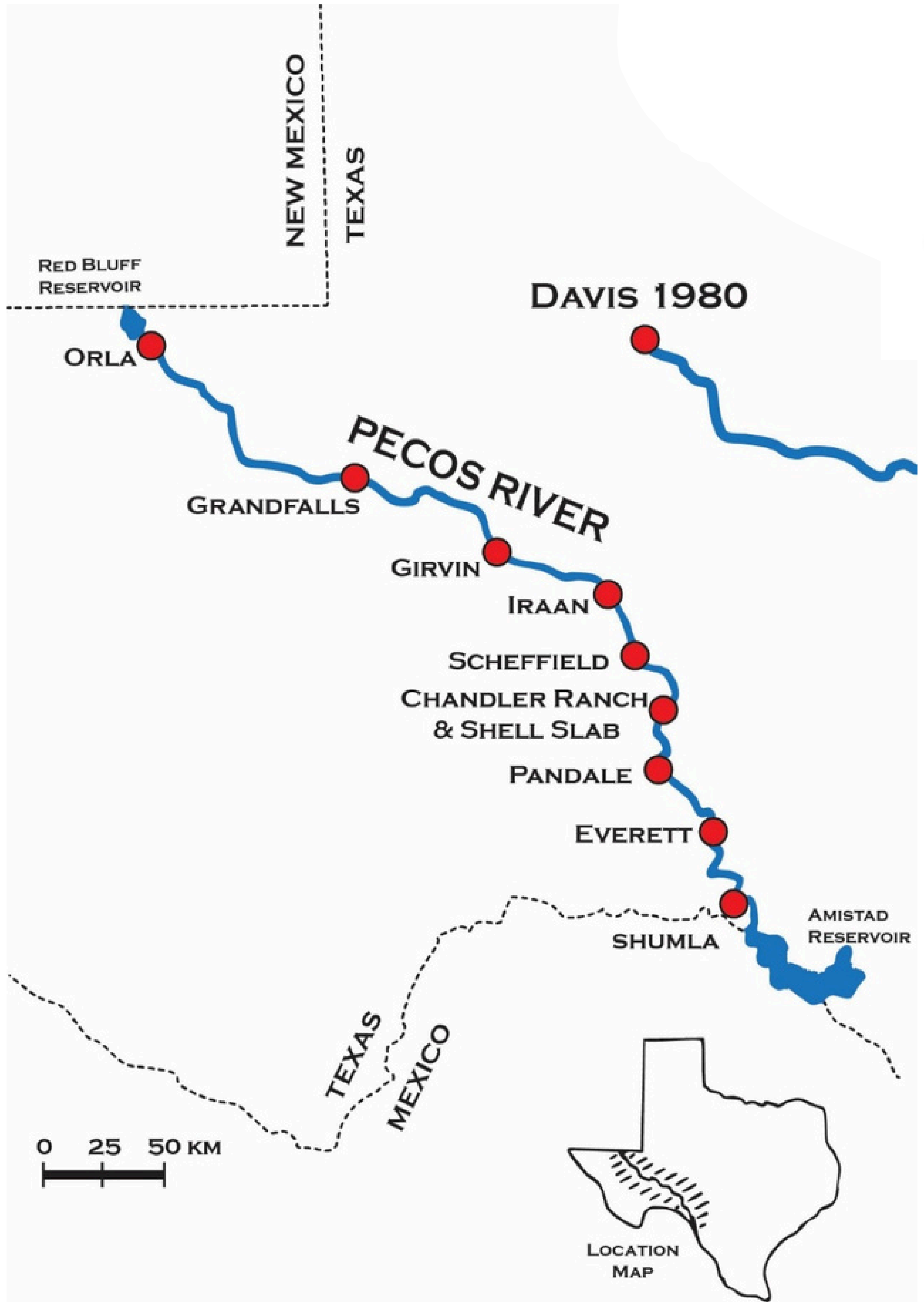
- Key Advantages
  - Comprehensive solute tracking (12+ constituents)
  - Explicit GW-SW coupling
  - Management scenario testing

- Integrated Hydrologic Process
  - GW/SW interaction
  - Water Availability
- Management
  - Water Allocation
  - Land application (irrigation)
  - In stream

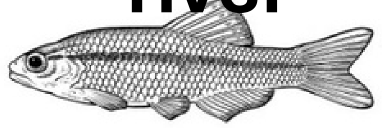


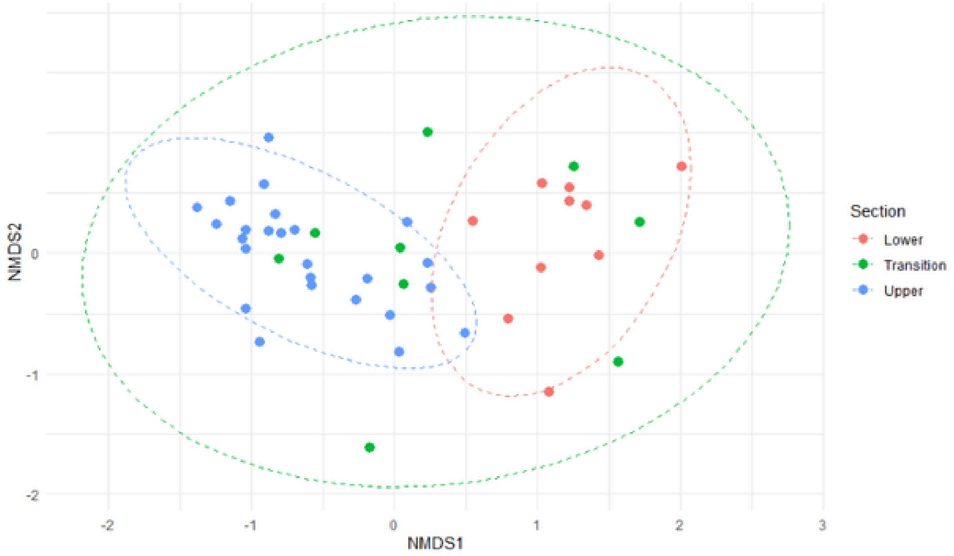


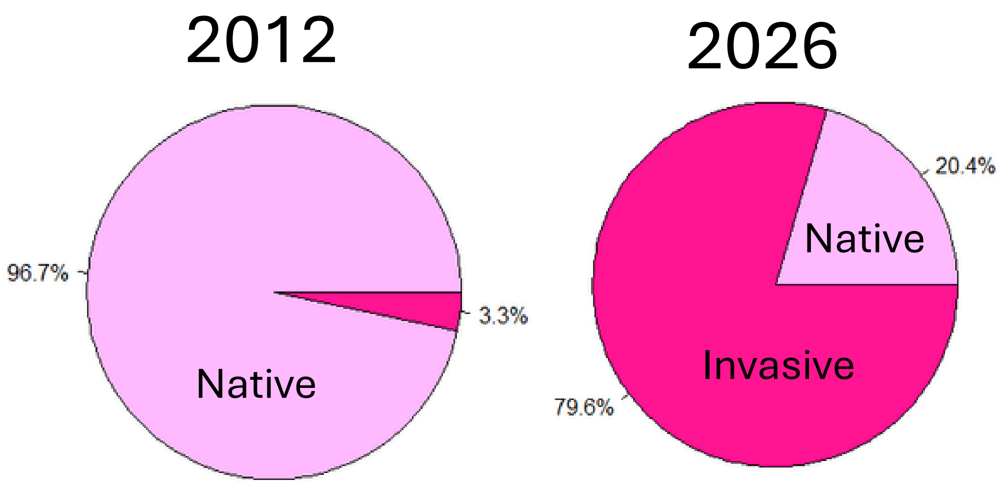
Ecological changes in the river biota – *past and future*



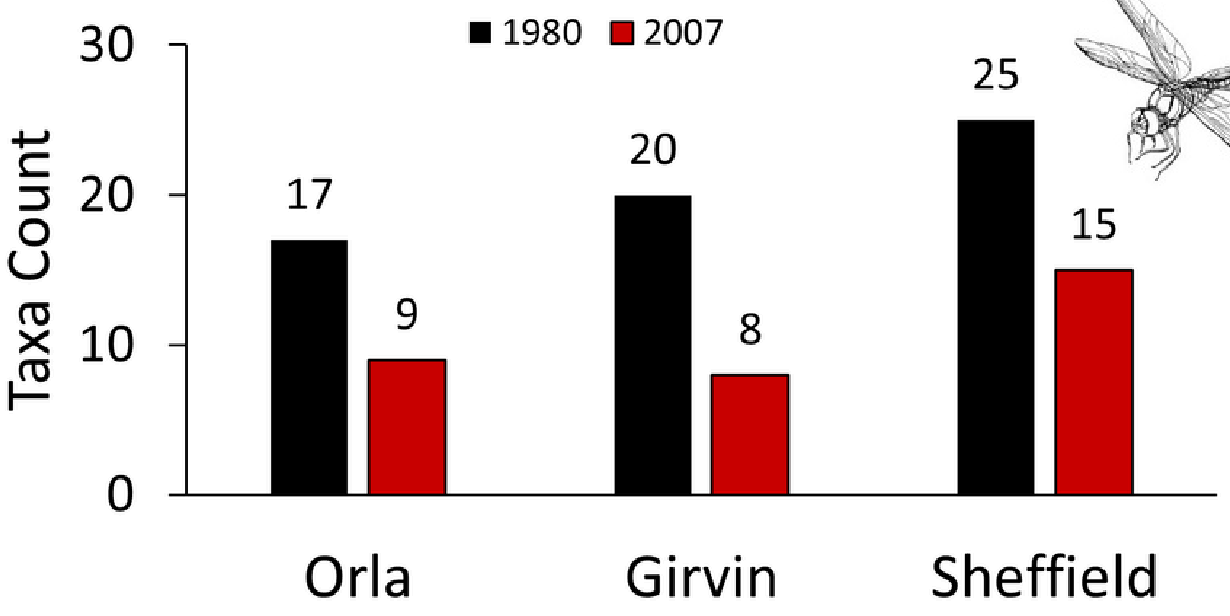
The fish community has changed drastically along the river

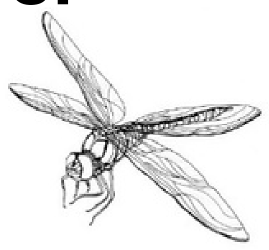




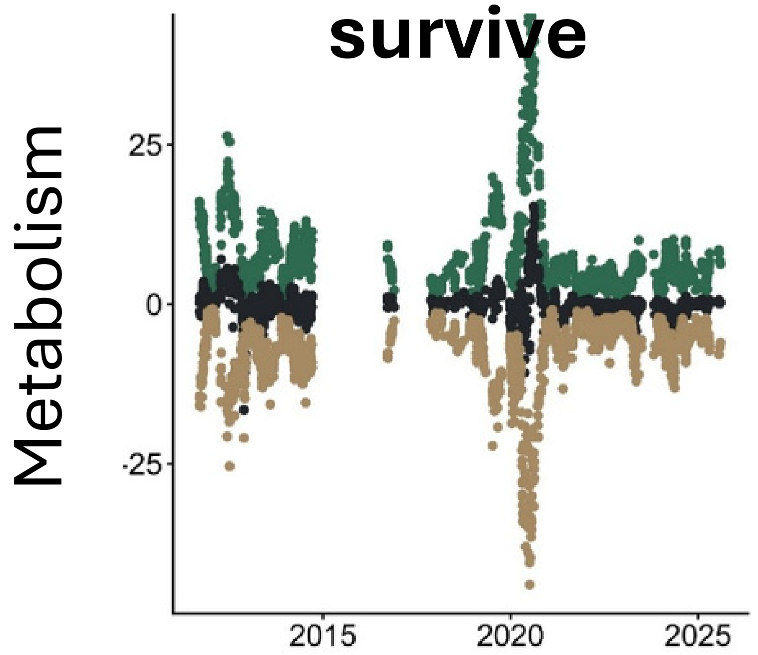


Aquatic invertebrates are disappearing from the river





Some locations are highly productive, but too harsh to survive



Land Application

Exploring opportunities for using polished desalinated produced water (PDPW) for growing crops, forages, and rangeland restoration aimed at sustainable crop-ecological systems with particular attention to soil health and microbial communities.

Soil Health

Assessing the impact of PDPW on soil health metrics such as microbial community structure, water infiltration, nutrient cycling, and resistance to erosion.

Crop Health

Examining impacts of PDPW on crop growth, physiology, root-shoot microbial dynamics and productivity to bridge the gap for water demand in agriculture.

Controlled Greenhouse Experiments

PDPW irrigation in greenhouse conditions to better understand risks and mechanisms of chemical uptake, plant growth, salt tolerance, and specialty crops.

Land Application – **Jagadish, Saddapalli , Kumari, Siebecker, Simpson, Slaughter, Millerick, Abbas)**

2025 (Midland site)

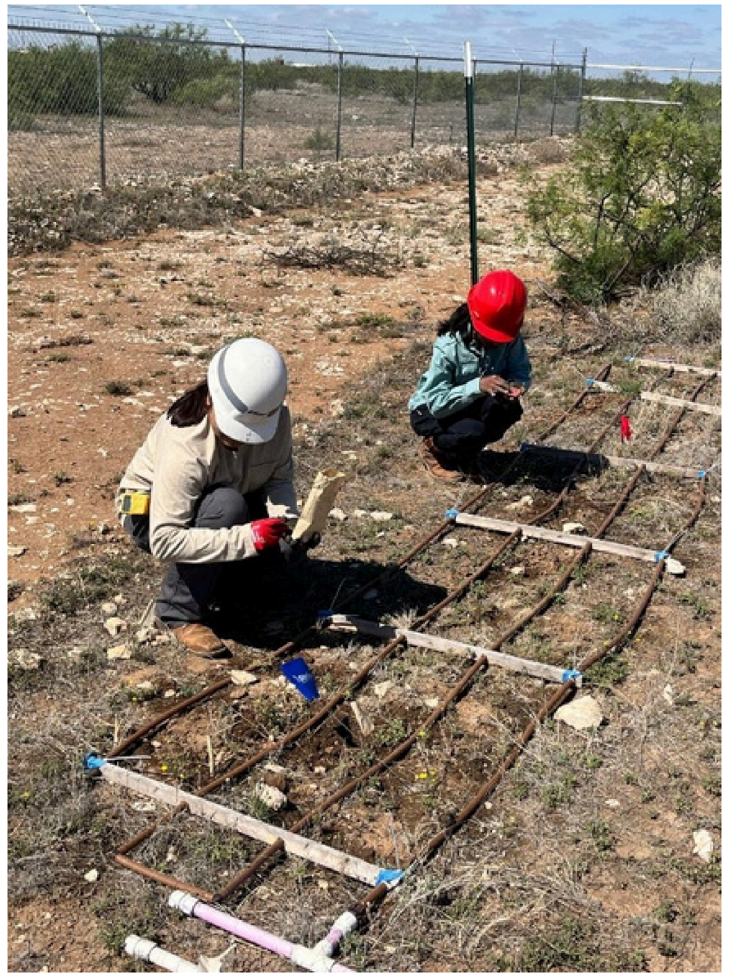
Well water

PDPW

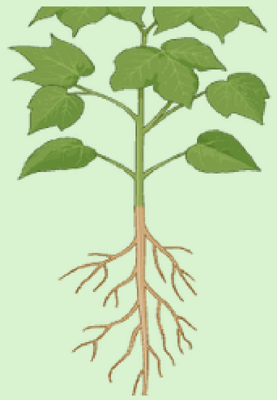
2026 (Midland site)

Tilling – 4/20/2026

Planting – 5/11/2026



- **In 2026 -** We planted the same varieties; however, we rotated cotton and sorghum plots.



Cotton

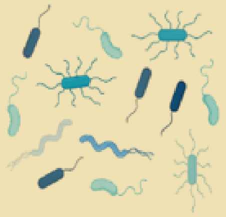
- Lower transpiration rate under PDPW irrigation

Sorghum

- Stable physiology
- Trace presence of barium in shoot

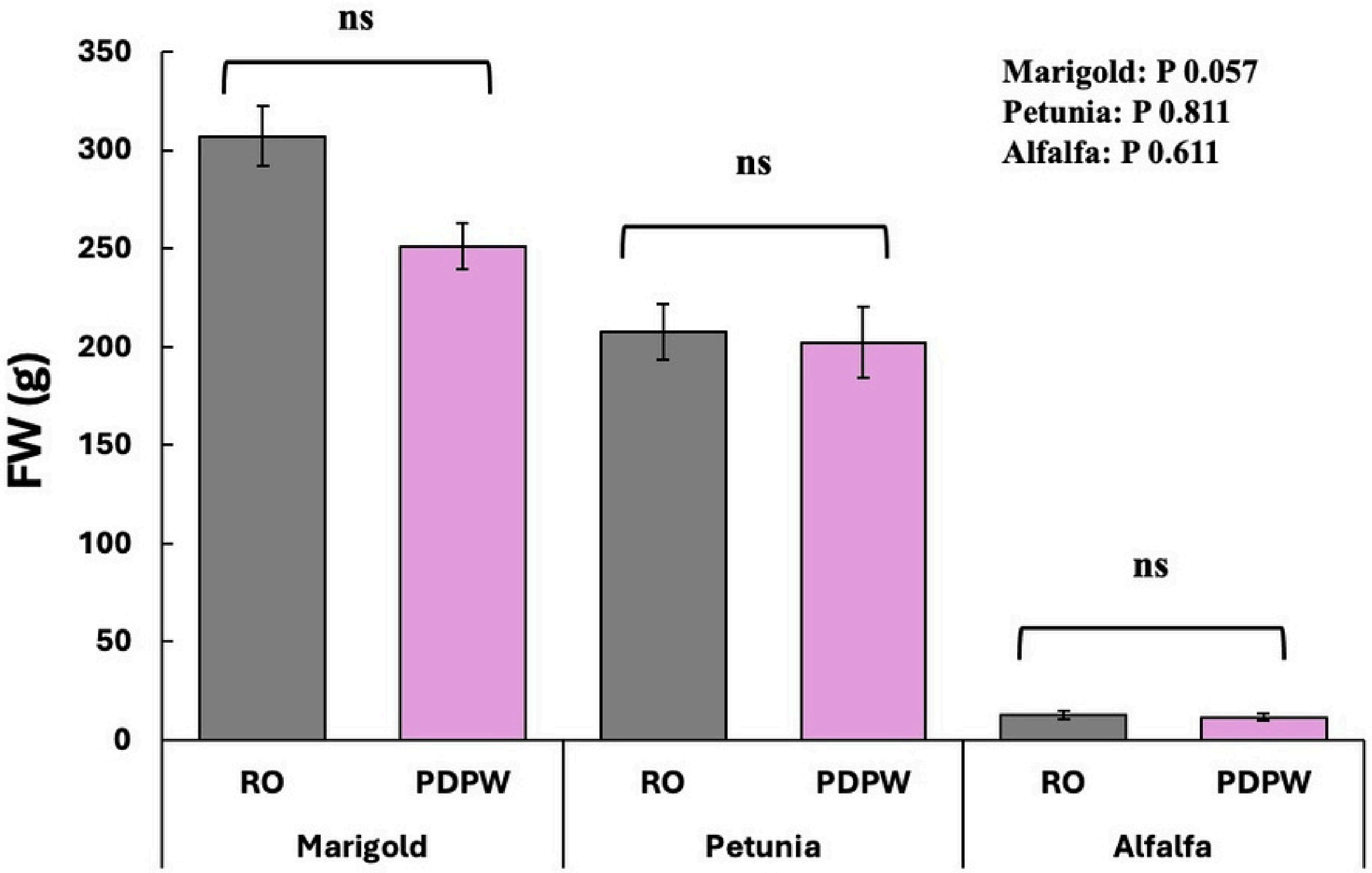
Microbial community

- No significant difference in Alpha and Beta diversity, however the abundance of the taxa is slightly varying



Metabolomic analysis

- No significant pathway changes under PDPW irrigation in either crop during early vegetative growth.



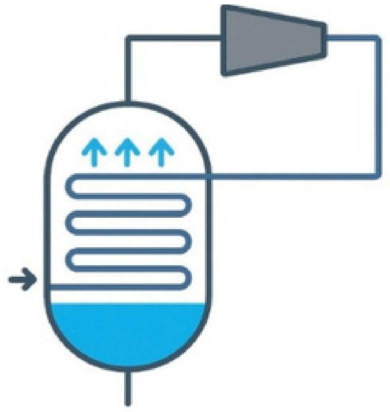
- No visible difference among the water treatments
- No effect of water treatments on FW of marigold, petunia, and alfalfa
- Promising results on selected ornamental plants
- Nutrient analysis and heavy metal analysis pending

Treatment Technologies

Transforming produced water (PW) from a waste stream into a valuable resource through advanced pretreatment, desalination, and post-polishing technologies; unlocking clean water and recovering critical minerals from PW. Conducting comparative economic-driven analysis of treatment technologies applicable to Permian Basin.

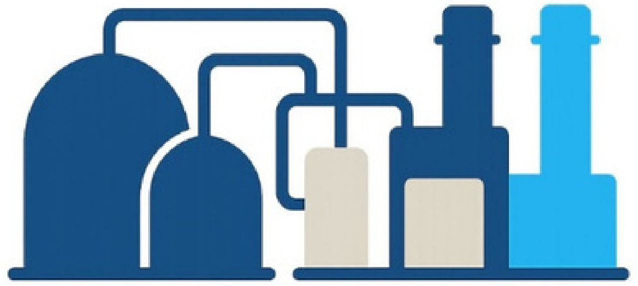
Thermodynamic Analysis + Process Simulation

Performing salt precipitation and scaling, vapor-liquid equilibrium of trace contaminants.



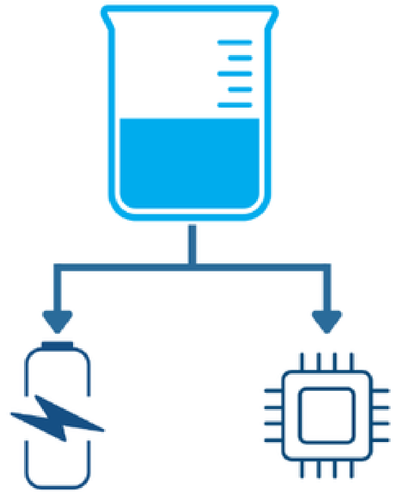
Treatment Trains

Evaluating efficacy of pre-treatment, desalination, and post-treatment technologies for beneficial reuse.



Critical Minerals/Materials Recovery

Characterizing critical minerals and materials in PW. Developing separation and purification methodologies to recover resources.



Treatment Technologies

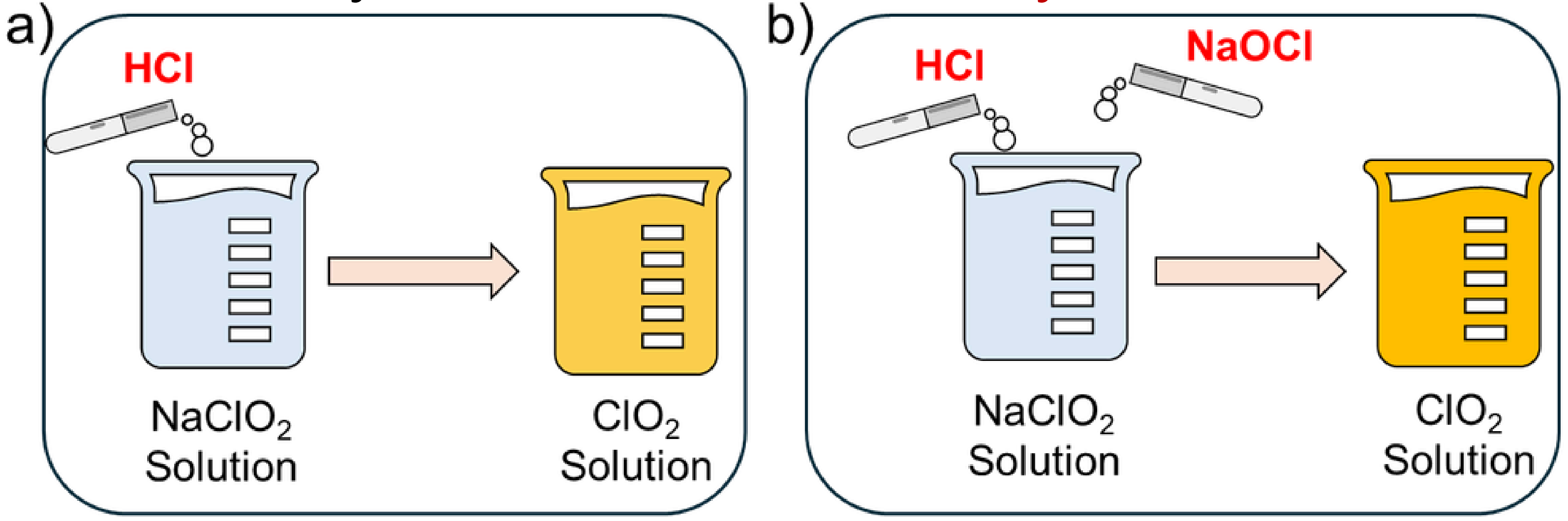
Pretreatment, Desalination, and Valorization

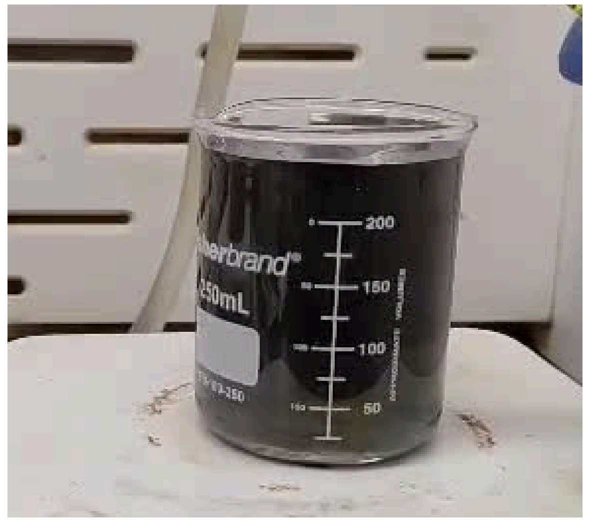
ClO_2 Pretreatment

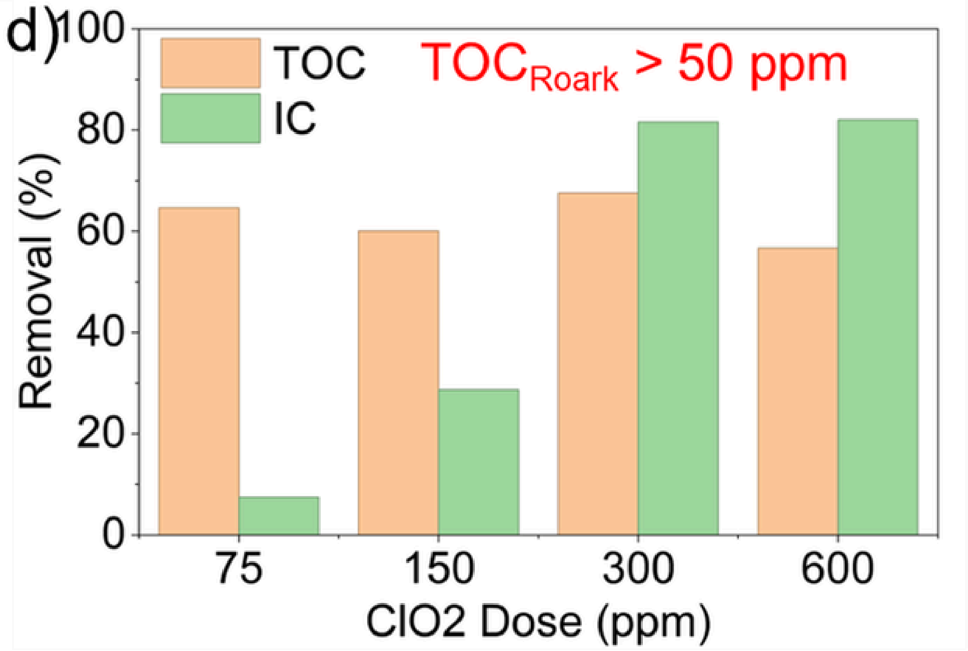
Optimizing in-situ generation

Max yield ~80%

Max yield ~100%







- Less chlorinated organic byproducts
- More effective against biofilms and antimicrobial activity at low dosage
- Works across a wide pH range
- Selective oxidation

MVC

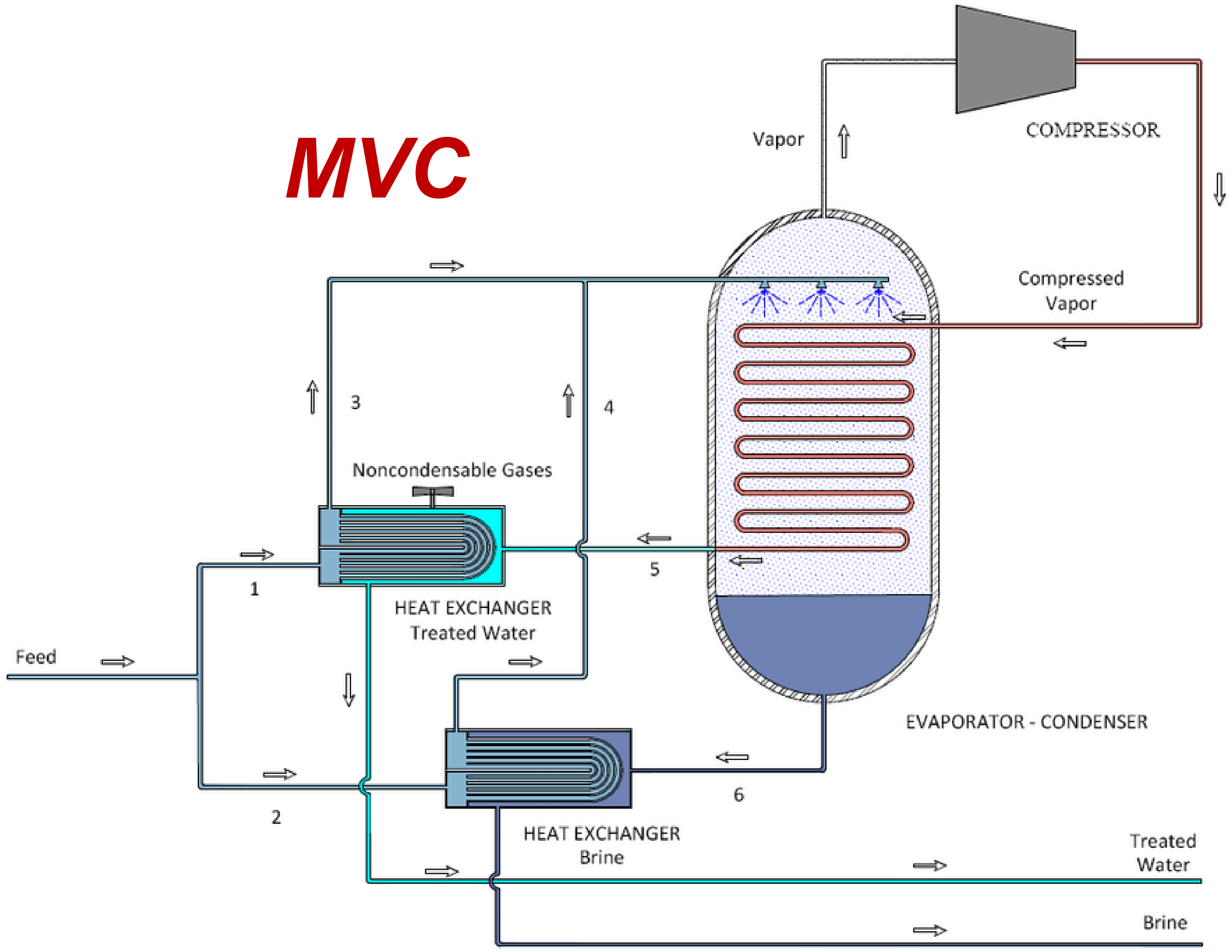


Table Projected distribution of selected trace contaminants after thermal desalination (e.g. MVC) as percentage of mass in feed (does not include post distillation treatment of water) Totals may not add to 100% due to rounding.

¹ Vapor typically lost via venting unless product water cooled significantly before storage

2 Strongly pH dependent (percentages shown reflect near neutral feed to desalination)

Texas Produced Water Consortium

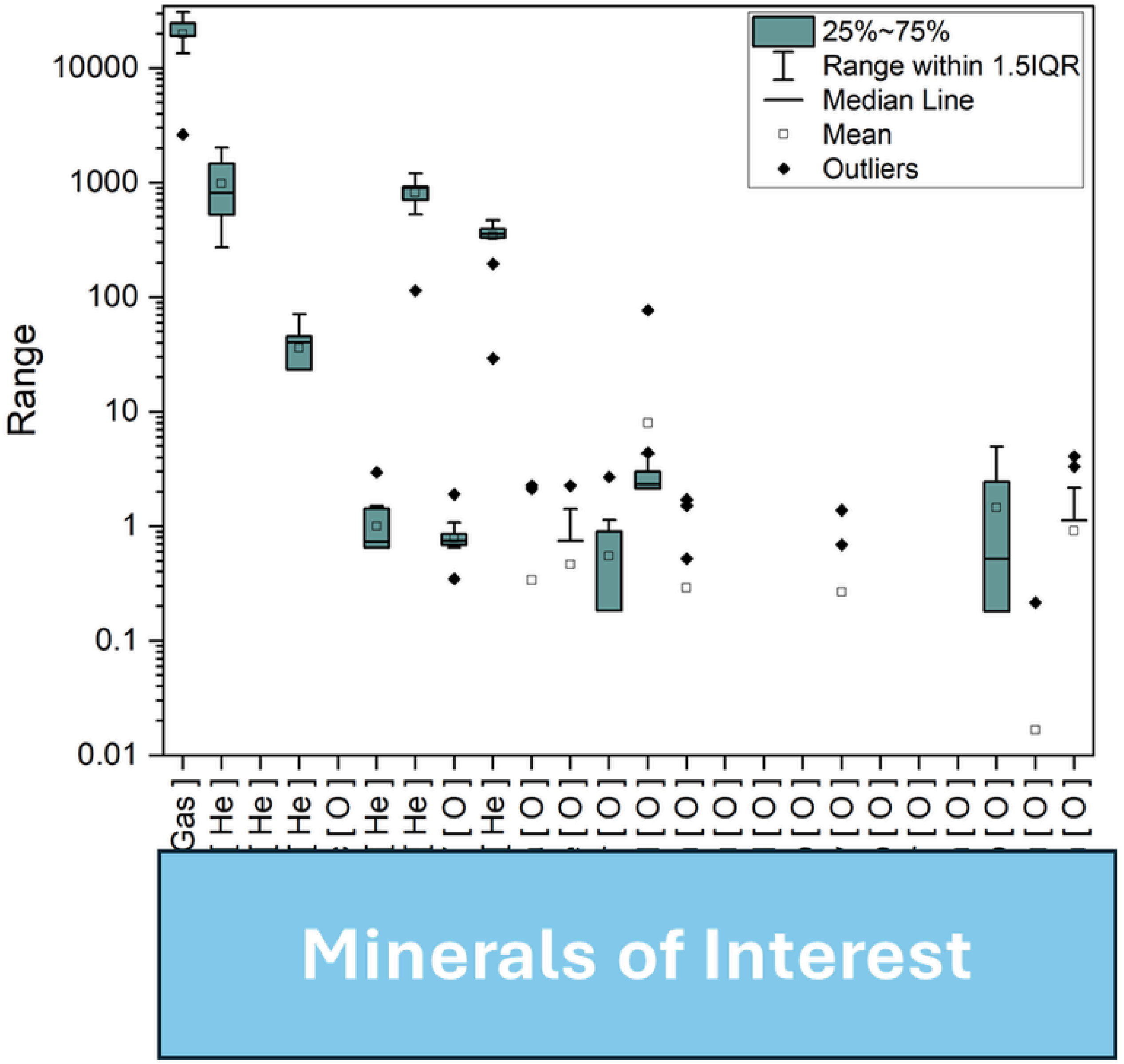
Treatment Technologies

Elements of interest (EOIs): Database and Recovery

Quantifying EOIs

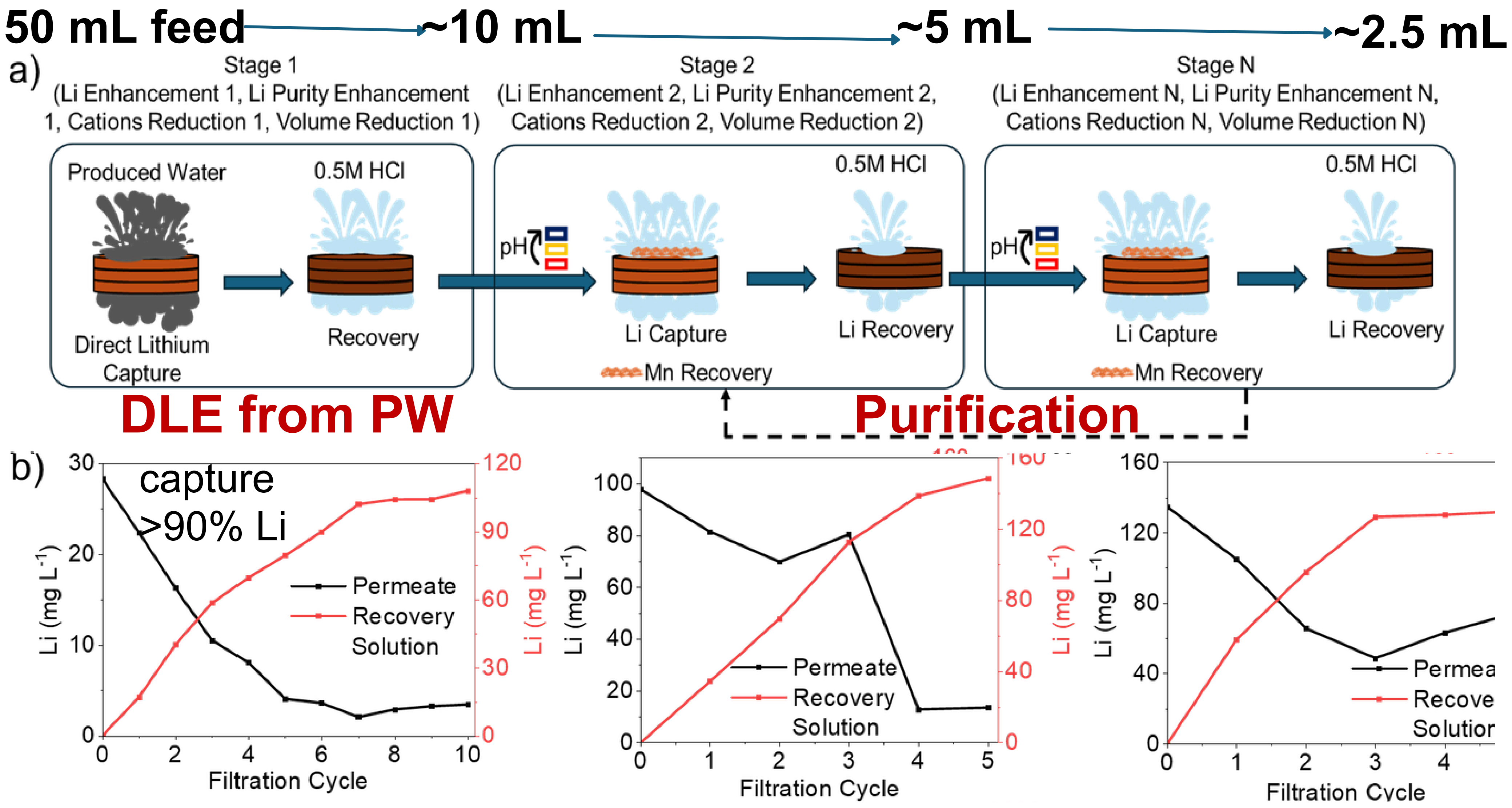
Challenge with current methods for characterizing EOIs

1. **Spectroscopic Interferences**
1. **Non-spectroscopic Interferences**



- 50 samples from 4 institutions (three machines)
- Various methods developed, optimized, and assessed
- Cross-validation (in progress)

DLE with Membrane Adsorbers



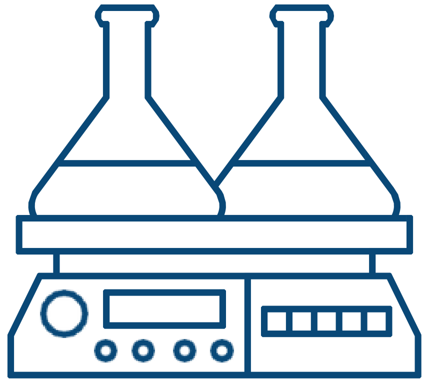
- Fast selective DLE (3-6 min cycles)
- Twenty-fold reduced sorbent loss
- Simultaneous lithium extraction, concentration, and purification

Energy-Water Nexus

Advancing the energy–water nexus with thermodynamic analyses to couple produced water (PW) treatment with waste heat and low-cost electricity from industrial systems. Re-imagining PW desalination as an energy-integrated process, where heat and electricity improve efficiency, reduce costs, and expand water recovery opportunities.

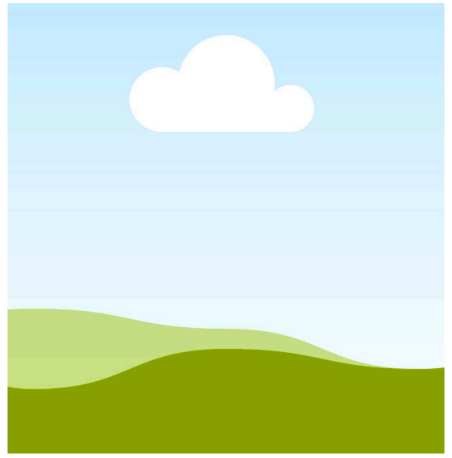
Zirconium Processing

Developing safe and efficient processes to recover zirconium from PW and advancing resource recovery.



Waste Heat Recovery for Desalination

Optimizing heat sources and desalination technologies from the First and Second law of thermodynamic perspectives to power treatment.



Industrial Partnerships

Collaborating with industrial partners to explore practical pathways for heat management and integrating exothermic reactions with desalination.

Energy-Water Nexus

- Collaborating with nuclear partner, Natura Resources, to better understand opportunities and challenges in heat management and integrating exothermic reactions with desalination.
  - Demonstrated TTU technical approach
  - Aspen process simulation of heat management flowsheet in molten salt reactor
  - Explore collaboration opportunity in medical isotope separation
- Continue development of comprehensive thermodynamic models for high salinity produced water and mechanistic process simulation models for desalination technologies
  - Thermodynamic Modeling of the Water + Sodium Hydroxide Binary System with the Association Electrolyte Nonrandom Two-Liquid Activity Coefficient Model, https://www.sciencedirect.com/science/article/pii/S0378381226000580

Law/Policy, Economics & Communication

Evaluating the regulatory, economic, and societal dimensions of produced water. Our work examines legal frameworks, policy implications, economic feasibility, and public perceptions to help inform responsible management strategies and support informed decision-making for potential beneficial uses of produced water.

Law/Policy

Examining the legal and regulatory impacts of beneficial reuse types such as discharge and application standards, federal law, and water ownership or transfer.

Economics

Evaluating the economic feasibility and scalability of PW treatment and resource recovery technologies to inform cost-effective, real-world deployment.

Communications

Translating complex PW science into clear communication while identifying public and stakeholder perceived benefits and risks to guide science-based education and future research.

Law, Policy, Econ., & Comms.

Social Media Listening Study

- Pilot data (202 posts) were collected using **social media listening** through **Sprout Social**, a social media monitoring and analytics platform.
- **Treatment and technology** emerged as the most frequently discussed theme
- **Policy, regulation,** and **health** were discussed less frequently
- The overall sentiment toward produced water was **primarily supportive**
- Environmental posts showed higher levels of skepticism
- **Next Steps:**
  - Additional data have been collected through a 12-month time period, and analysis is currently underway

Stakeholder Interviews:

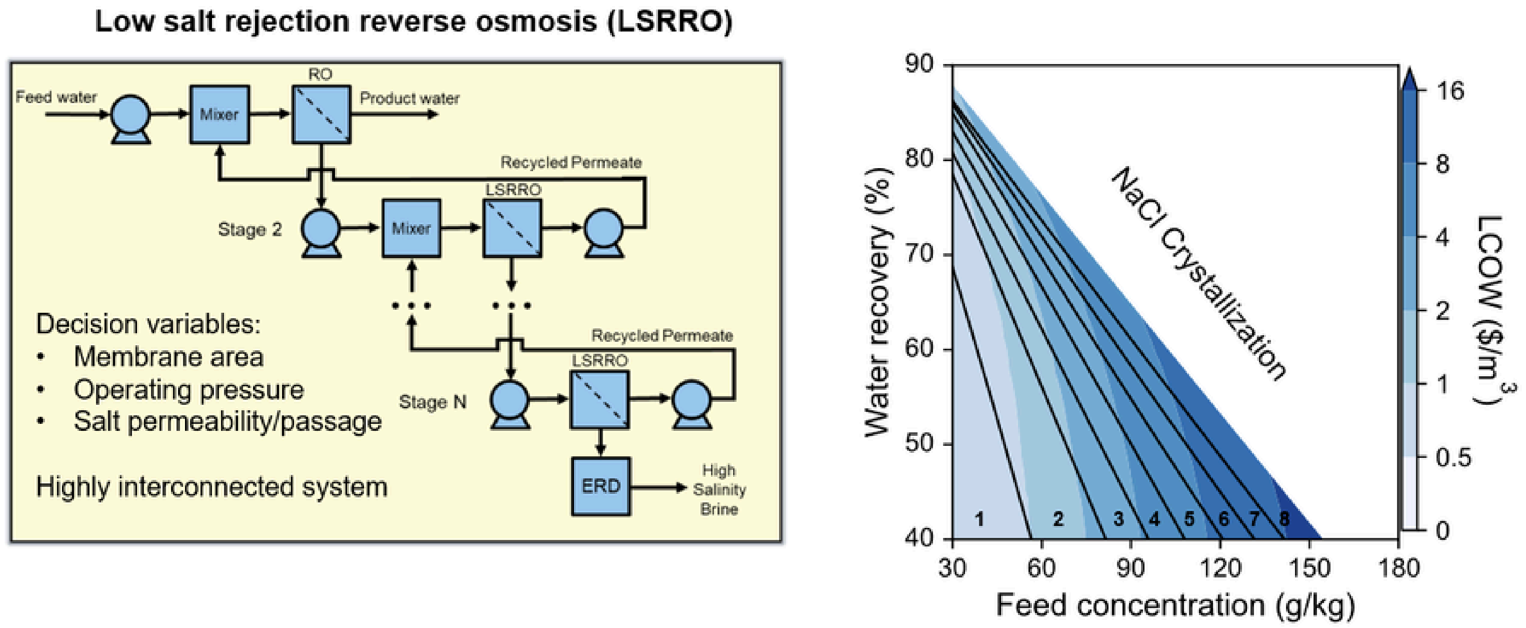
- Ongoing interviews with key stakeholder groups to explore perceived **risks, benefits,** and **barriers** to the beneficial reuse of polished desalinated produced water
- **Completed**: Agricultural Water Users, Environmental Interests, Landowners / Ground Water Owners, Researchers, Public Water Utilities, Oil and Gas Fluid Waste Recycling Operators, and Groundwater Conservation Districts
- **Upcoming:** Industrial Water Users, Oil & Gas, and River Authorities
- Deidentified transcripts will be downloaded into DelveQDA, a qualitative data analysis software, for inductive, **thematic analysis**
- Results will inform the **Q-Sort study**

Law, Policy, Econ., & Comms.

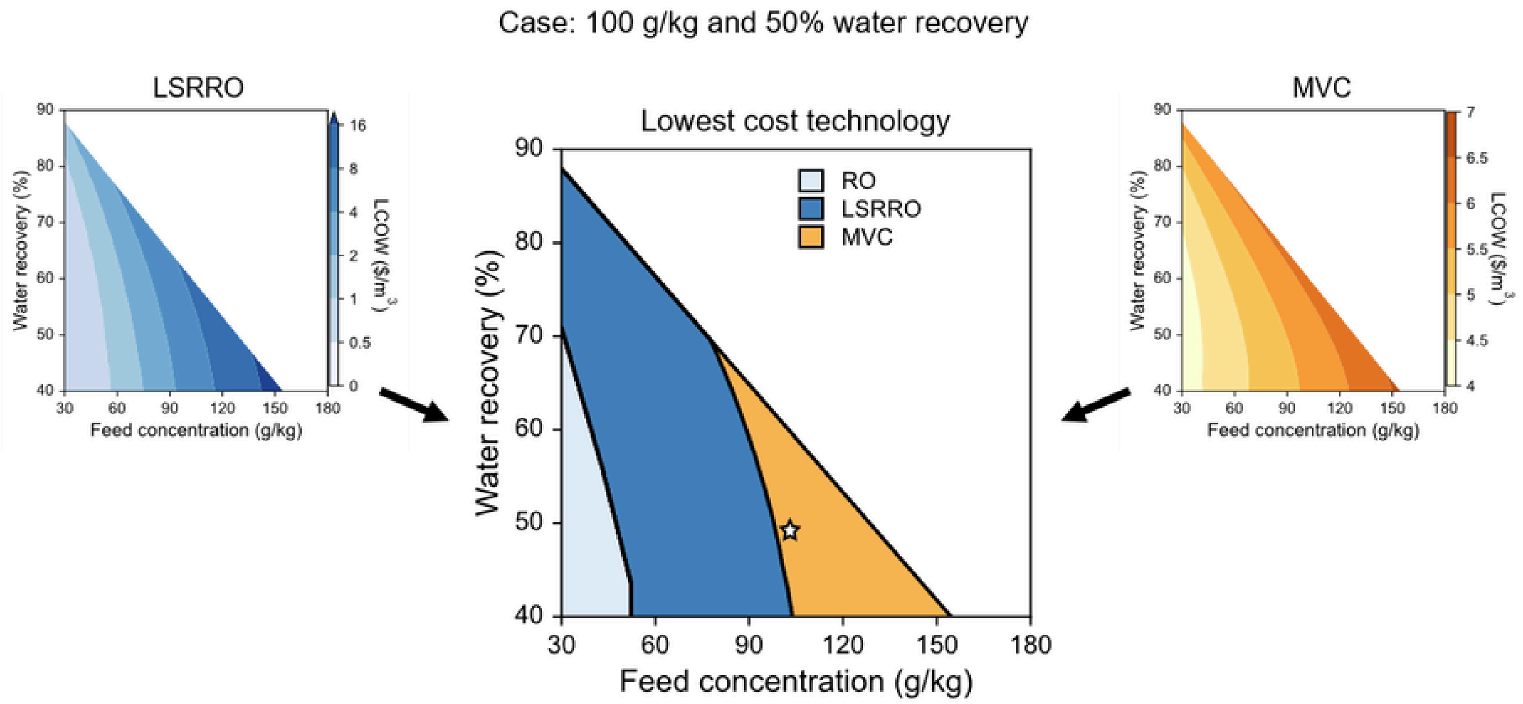
Techno-Economic Assessment (TEA)

- Tim Bartholomew (Horizon Modeling) is developing two interactive WaterTAP models, each including pre-treatment, desalination, and post-treatment; one for thermal distillation desalination and one for low salt rejection reverse osmosis (LSRRO)
- A graphical user interface (GUI) will be developed for TxPWC members to be able to run the models and vary input parameters
- Collaborating with NMPWRC to avoid duplicating efforts
    - Baseline model for comparison: OWS, DAF, UF, MVC, GAC, Zeolite
- Input on draft model will be requested this summer
- Input on refined model will be requested early fall

Exploring the potential of a novel membrane process



Quantifying technoeconomic viability through comparison

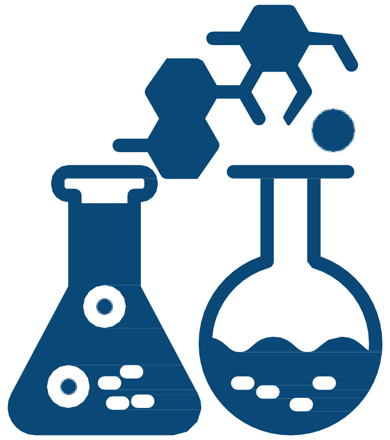


Water Quality & Toxicology

Integrating targeted and non-targeted chemical analysis to evaluate the quality and safety of polished desalinated produced water (PDPW) by evaluating how it impacts plants and animals. Identifying potential risks to ensure PDPW can be used safely.

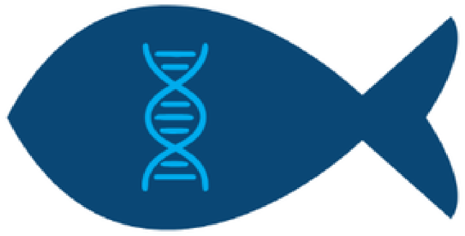
Chemical Analysis

Analyzing treated produced water for potentially harmful constituents.



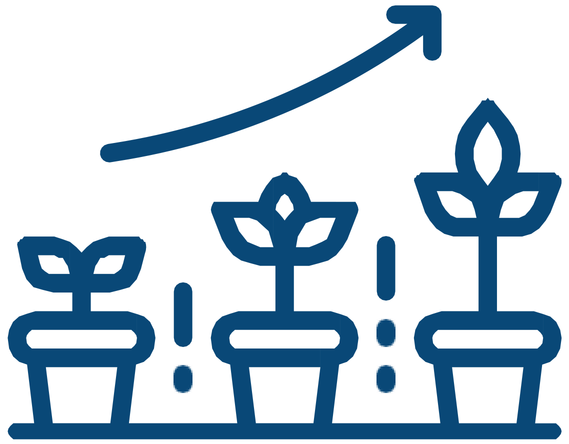
Aquatic Toxicity Testing

Performing Whole Effluent Toxicity (WET) testing on aquatic species to support informed decision-making.



Terrestrial Toxicity Testing

Assessing potential negative impacts to plants and soil invertebrates from the use of treated produced water for irrigation.



Produced Water Treatment Steps

PW

- **Raw Produced Water (PW)**
  - turbid, hypersaline; mostly deep geologic formation water mixed with some flowback water from hydraulic fracturing

Pre-Treatment

- solid-liquid separation (*e.g.*, dissolved air floatation [DAF])
- oxidation (*e.g.*, ozonation, hydrogen peroxide, or chlorine dioxide)
- microfiltration (MF) or ultrafiltration (UF) for membrane desalination

TPW

- **Pre-Treated PW (TPW)**
  - clear (very low suspended solids), but high salinity and dissolved contaminants remain

Desalination

- thermal (*e.g.*, distillation-based or freeze-thaw-based)
- membrane (*e.g.*, reverse osmosis [RO], membrane distillation [MD], electrodialysis [ED])
- solvent/absorption

DPW

- **Desalinated PW (DPW)**
  - low salinity, but trace contaminants remain

Post-Treatment

- physical (*e.g.*, degassing)
- chemical (*e.g.*, granular activated carbon (GAC) filtration or advanced oxidation)
- biological (*e.g.*, nitrification and denitrification)

PDPW

- **Polished DPW (PDPW)**
  - final product water that meets permit requirements, protective of the environment and public health

Reuse

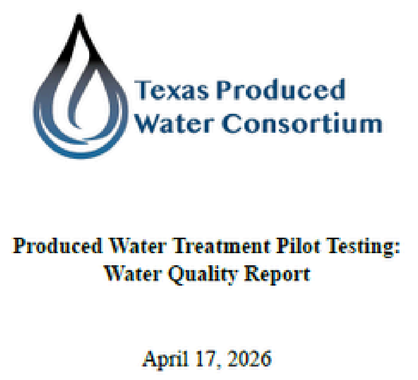
- industrial reuse
- stream discharge
- land application (crop irrigation or rangeland rehabilitation)

TxPWC PW Treatment Piloting: WQ Report

- Five pilot systems (water samples collected during 2024-2025)

Table 1. Summary of Permian Basin pilot testing projects collaborating with TxPWC

Sub-Basin	**Nominal Feed Flow Rate (bbl/day)**	**Number of Months of Testing**
Delaware	100	18
Midland	300	6
Delaware	500	3
Delaware & Midland	20	18
Midland	800	2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Produced Water Treatment Pilot Testing:
Water Quality Report

April 17, 2026

TxPWC PW Treatment Piloting: WQ Report

- 60 water samples analyzed by Eurofins (third-party)
  - >17,000 water quality analytes

Table 2. Summary of water samples analyzed for water quality in pilot testing of treatment of produced water

Water Type	Number of Samples
Raw PW (PW)	17
Pre-Treated PW (TPW)	13
Desalinated PW (DPW)	12
Polished DPW (PDPW)	18
Total	60

TxPWC PW Treatment Piloting: WQ Report

- What does PW contain?
  - naturally occurring dissolved minerals
    - mostly sodium and chloride
    - aluminum, bicarbonate, calcium, magnesium, potassium, sulfate, *etc*.
  - naturally occurring dissolved metals
    - arsenic, barium, chromium, iron, lithium, manganese, strontium, *etc*.
  - naturally occurring radioactive material (NORM)
    - actinium-228, bismuth-214, lead-214, potassium-40, radium-226, radium-228, *etc*.
  - naturally occurring reduced forms of nitrogen and sulfur
    - ammonia and hydrogen sulfide
  - naturally occurring organic compounds, especially petroleum hydrocarbons
    - aliphatics (containing straight or branched chains of carbon atoms)
      - alkanes (paraffins), containing only single bonds (*e.g.*, n-hexane, n-decane)
      - cycloalkanes (naphthenes), with carbon atoms arranged in ring structures (*e.g.*, cyclohexane)
    - aromatics (containing one or more benzene rings)
      - single-ring aromatics (*e.g.*, benzene, toluene, ethylbenzene, xylene ("BTEX")
      - polycyclic aromatic hydrocarbons (PAHs), compounds with two or more bonded benzene rings (*e.g.*, naphthalene, anthracene)

TxPWC PW Treatment Piloting: WQ Report

- Chemicals used in hydraulic fracturing and PW management

Table 3. Purposes and examples of chemicals used in hydraulic fracturing and produced water management

Chemical Purpose	Example Chemicals
Antifreezing agent	ethylene glycol, methanol
Bacteria control, biocide	peracetic acid, glutaraldehyde, quaternary amines (benzalkonium), isothiazolinones
Clay stabilizer	quaternary ammonium salts, sodium chloride, potassium chloride
Coagulant	polyaluminum chloride
Corrosion inhibitor	amines, petroleum distillates
Crosslinker	borate salts and potassium hydroxide
Demulsifier (emulsion breaker)	ethyl-oxalated compounds, peroxydisulfate salts, nonylphenol ethoxylates, ammonium persulfate
Emulsifier	isopropyl alcohol
Enhanced oil recovery	terpenes from orange peel
Friction reducer	polyacrylamides, acrylamide copolymers, and AMPS copolymers
Gel breaker	strong oxidizers, ammonium persulfate, sodium bromate
Gelling agent	guar gum, sodium borate, cellulose-based polymers
Iron control	citric acid
Non-emulsifier	methanol, ethanol, petroleum distillates, naphtha, isopropanol
Oxidizer	hydrogen peroxide, sodium hypochlorite (bleach), chlorine dioxide
pH control	acids (acetic, hydrochloric, sulfuric) or bases (hydroxide, carbonate)
Proppant	silica sand, (specialty: glass beads)
Scale inhibitor	polyphosphonate (polyDADMAC) or polycarboxylic acid
Solvent	xylene
Surfactant	polyethylene glycol alkylphenyl ether, nonylphenol polyoxyethylene ether, ammonium sulfate

TxPWC PW Treatment Piloting: WQ Report

- 582 of 765 analytes (76%) not detected

Table 4. Select analytical methods from which there were no detected values in any samples for which they were analyzed

Analytical Method	Analysis	Samples	Number of Analytes
EPA 1668A	Chlorinated Biphenyl Congeners (PCBs) by HRGC/HRMS	3 (3 PW)	168
EPA 1633*	Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS	7 (2 PW; 1 PT; 1 DPW; 3 PDPW)	40
EPA 8141B*	Organophosphorous Compounds (Pesticides) by GC, Capillary Column Technique	6 (1 DPW; 5 PDPW)	26
EPA 8081B	Organochlorine Pesticides (GC)	26 (6 PW; 3 PT; 1 DPW; 16 PDPW)	24
EPA 6020B_REE	Rare Earth Metals (ICP/MS)	36 (17 PW; 3 PT; 16 PDPW)	19
EPA 8321B_Herb	Herbicides (LC/MS)	15 (1 PW; 1 PT; 2 DPW; 11 PDPW)	11
EPA 8082A	Polychlorinated Biphenyls (PCBs) by GC	26 (6 PW; 3 PT; 1 DPW; 16 PDPW)	7
EPA 504.1*	EDB, DBCP and 1,2,3-TCP (soil fumigants) by GC	10 (10 PDPW)	2
EPA 547	Glyphosate (DAI HPLC)	9 (9 PDPW)	1
EPA 6850	Perchlorate by LC/MS or LC/MS/MS	24 (11 PW; 1 PT; 1 DPW; 11 PDPW)	1
SM 4500SO3_B	Sulfite	19 (10 PW; 9 PDPW)	1
Total	-	-	*300*

Notes: * and variants; DIA – direct aqueous injection; GC – gas chromatography; HP – high performance; HR – high resolution; ICP – inductively coupled plasma; LC – liquid chromatography; MS – mass spectrometry

https://www.depts.ttu.edu/research/tx-water-consortium/2026-water-quality-report.php

TxPWC PW Treatment Piloting: WQ Report

- Summary of key constituents across four water types

Table 5. Select detected constituents and averages of detected concentrations for the four PW water types

Analyte	Units	Raw PW (PW)		Pretreated PW (TPW)		Desalinated PW (DPW)		Polished DPW (PDPW)	
		detects/ analyses	avg. of det. conc.	detects/ analyses	avg. of det. conc.	detects/ analyses	avg. of det. conc.	detects/ analyses	avg. of det. conc.
Acetone	mg/L	3/11	0.652	9/11	0.264	11/11	0.169	0/10	<0.00307
Aluminum†	mg/L	0/11	ND	1/11	0.006	0/1	ND	8/11	0.107
Ammonia	mg/L	19/19	620	3/3	419	13/13	21.9	16/23	6.46
Arsenic†	mg/L	1/17	0.00246	0/3	<0.0345	0/1	<0.00138	8/17	0.00155
Barium†	mg/L	17/17	10.3	3/3	9.47	0/1	<0.00268	13/17	0.00925
Benzene	mg/L	17/17	6.32	3/13	0.2	7/12	0.00226	0/17	<0.00046
Benzyl alcohol	mg/L	1/6	0.00205	1/2	0.0277	NA	NA	5/6	0.00789
Boron†	mg/L	17/17	58.0	3/3	55.9	11/11	5.14	14/17	5.32
Chloride	mg/L	17/17	77,005	3/3	59,233	10/11	37.6	17/17	80.5
Chromium†	mg/L	3/17	0.342	0/3	<0.028	1/1	0.0284	7/17	0.00222
Ethylbenzene*	mg/L	17/17	0.229	1/13	0.0275	0/12	<0.00039	0/17	<0.00039
Formaldehyde*	mg/L	6/6	0.768	1/3	0.115	0/2	<0.00066	2/16	0.0352
Glutaraldehyde*	mg/L	1/1	0.557	1/1	0.0527	0/2	<0.03	0/11	<0.03
Gross alpha	pCi/L	13/16	1394	1/1	1370	1/1	1.63	0/15	<12.1
Gross beta	pCi/L	16/16	1014	1/1	598	1/1	1.75	8/15	1.73
Methanol*	mg/L	2/6	4.43	1/3	98.1	3/7	6.1	0/16	<2.27
Naphthalene	mg/L	7/18	0.0582	1/14	0.0043	0/14	<0.00135	0/28	<0.00135
Phenols, total	mg/L	NA	NA	NA	NA	1/1	0.0066	3/9	0.0112
Sodium†	mg/L	17/17	33,470	3/3	31,033	8/8	48.9	17/17	80.53
Specific Conductance‡	µS/cm	10/11	176,000	1/1	179,000	11/11	396	10/11	314
Toluene	mg/L	17/17	5.03	1/13	0.541	5/12	0.000755	4/17	0.00446
Total Dissolved Solids (TDS)	mg/L	17/17	131,117	3/3	124,333	11/11	317	15/15	352
Total Organic Carbon (TOC) †	mg/L	17/17	84.3	13/13	44.3	10/10	1.83	3/16	1.04
Total Organic Halogens (TOX)	mg/L	NA	NA	NA	NA	1/2	0.124	4/5	0.174
Total Petroleum Hydrocarbons (TPH) (C6-C35)	mg/L	10/11	158	0/1	<0.912	0/2	<0.876	3/11	1.13
Ultraviolet absorption	1/cm	9/9	0.206	9/9	0.165	1/1	0.066	10/10	0.0268
Uranium†	mg/L	0/16	<0.0105	0/3	<0.0105	0/1	<0.00042	1/16	0.00102
Xylenes, total*	mg/L	17/17	2.13	1/13	0.195	1/12	0.00234	0/17	<0.00124

* listed in Frac Focus; † unfiltered/total basis; ‡ electrical conductivity, µmho/cm = µS/cm = 0.001 mS/cm = 0.001 dS/m; "NA" not analyzed

Texas Produced Water Consortium

https://www.depts.ttu.edu/research/tx-water-consortium/2026-water-quality-report.php

TxPWC PW Treatment Piloting: WQ Report

- Efficacy of full treatment train (*i.e.*, polished desalinated PW [PDPW] versus raw PW)
  - >99% removal of salinity, organics, and radioactivity
  - >99.7% removal of TDS, Na, & Cl
    - *e.g.*, avg PW TDS 131,117 mg/L → avg PDPW TDS 352 mg/L
  - >99.3% removal of TOC & TPH
- In the absence of TCEQ permit requirements for surface discharge and land application, >98% of comparable PDPW chemical water quality parameters comply with DW standards

TxPWC PW Treatment Piloting: WQ Report

- Whole effluent toxicity (WET) testing results (acute & chronic)
  - 18 samples: 2 desalinated PW and 16 polished desalinated PW
  - Three trophic levels: primary produces, primary consumers, & secondary
- For DPW: no toxicity in 3 of 16 (19%) of toxicity endpoints
- For PDPW: no toxicity in 85 of 95 (89%) of toxicity endpoints

Table 6. Whole effluent toxicity (WET) test results

Test	**Endpoint**	**Desalinated PW (DPW)**		**Polished DPW (PDPW)**	
		Not Toxic/ Total	Avg NOEC	Not Toxic/ Total	Avg NOEC
Common Water Flea, Acute 48 or 96-hr (*Daphnia pulex*), EPA 2021	Survival	0/2	50%	2/2	100%
Fathead Minnow, Acute 48 or 96-hr (*Pimephales promelas*), EPA 2000	Survival	0/2	38%	16/16	100%
Fathead Minnow, Chronic (*Pimephales promelas*), EPA 1000	Growth	0/2	31%	10/14	80%
	Survival	1/2	56%	13/14	96%
Green Algae, Chronic 7-day (*Selenastrum capricornutum*), EPA 1003	Growth	0/2	27%	1/3	54%
Water Flea, Acute 48-hr (*Ceriodaphnia dubia*), EPA 2002	Survival	0/2	50%	15/18	88%
Water Flea, Chronic 7-day (*Ceriodaphnia dubia*), EPA 1002	Reproduction	0/2	38%	14/14	100%
	Survival	2/2	100%	14/14	100%

Note: "Not Toxic" refers to no observable effect at 100% concentration (*i.e.*, no dilution required); NOEC – no observable effect concentration (*e.g.*, 88% means 88% sample water with 12% control water to yield no statistical difference from 100% control water)

Conclusions

- 60 water samples from 5 pilot systems were analyzed (2024-2025)
- polished desalinated produced water (PDPW) pilot treatment systems were effective at removing >99% of salinity, radioactivity, and organics
  - avg TDS 352 mg/L, suitable for most beneficial reuse applications (*e.g.*, streamflow augmentation, rangeland rehabilitation, and crop irrigation)
  - Examples of no detects: benzene, glutaraldehyde, gross alpha, methanol, naphthalene, and xylenes were below analytical method detection limits (MDLs)
  - 75 of 76 comparable polished desalinated produced water (PDPW) water quality parameters (>98%) complied with TCEQ drinking water limits.
  - whole effluent toxicity (WET) testing: 85 of 95 toxicity endpoints showed no toxicity in undiluted PDPW samples.

Ongoing and Future Work

- Larger pilot-scale and full-scale produced water treatment systems under construction, expected completion Q2-Q3 2026
- Continue collaboration with NMPWRC and industry on targeted and non-targeted chemical analyses, as well as advanced toxicity testing
- Collaborating on water treatment process optimization
- Basin-scale hydrologic modeling with riverine ecological analyses
- Land application field trials and greenhouse studies
    - Demonstrations of both rangeland rehabilitation and crop irrigation in the Delaware and Midland sub-basins of the Permian

TxPWC Annual Members Meeting

- Date: August 11, 2026
- Location: Midland, TX
- Venue: Bush Convention Center
- PWS Permian Basin Summit: Aug 11-13

Thank You! Questions?

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