

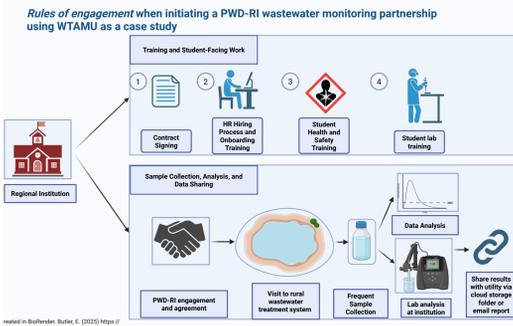
Building a Stronger Network: Best Practices in Initiating a Public Works Department-Regional Institution (PWD-RI) Partnership for Wastewater Monitoring in Rural America



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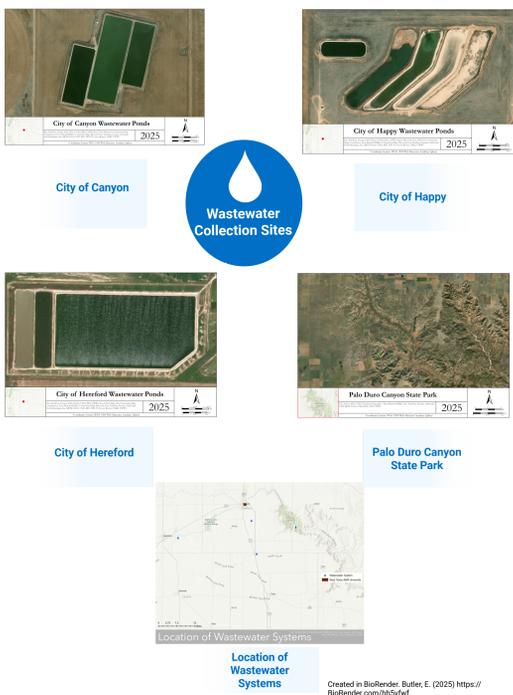
GRAPHICAL ABSTRACT



A general overview of the process to develop a partnership between a regional institution and a rural public works department using West Texas A&M University (WTAMU) as a case study. **Note:** "Contract Signing" is in reference to any funding or financial support offered to the researchers engaged in the research activity which may or may not be from the utility.

INTRODUCTION AND BACKGROUND

During spring 2025, our research team was tasked to collect at least one wastewater sample from **three** rural West Texas cities and **one** State Park. Each city uses a pond system, while the State Park has septic systems stationed throughout the park near restrooms and cabins. For each sample collected, we measured the total dissolved solids (TDS), total suspended solids (TSS), and volatile suspended solids (VSS) concentrations.



Key Takeaways when Involving Students in Wastewater Partnerships

Point 1 Allocate extra time

Research at a regional institution may require more time for hiring, contracts, and training. Ensure that financial sponsors are aware of this and plan accordingly.

Point 2 Prioritize student schedules

Many students at a regional institution work an outside job. Therefore, consider allocating student work at the beginning of the semester, and/or during the semester breaks.

Point 3 Leverage university-community goodwill

Regional institutions may serve as the backbone of the community. Emphasize the importance of the research to forward the objectives of the program and institution.

Point 4 Be Service Oriented

Identify the needs of the community in terms of wastewater monitoring. Consider the analytes of concern for the community.

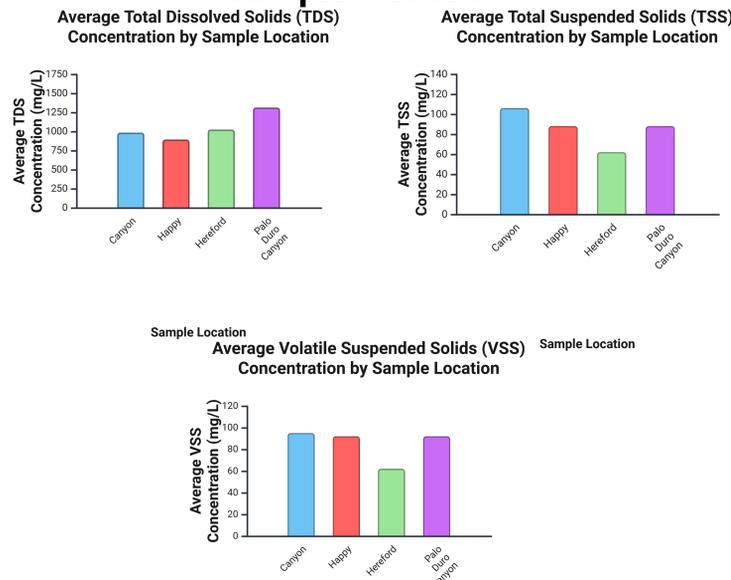
Point 5 Participate in Site Visits

Make multiple visits to the sites and public spaces. Understand the limitations of the sampling locations before taking samples. Visit meetings of utility organizations.

Point 6 Communicate Often

Ensure that the PWD and RI partners understand the expectations of one another. Send data once baseline and the students' level of comfortability with laboratory methods has been obtained.

Sample Results



Sample Date by location: May 15, 2025 (Pond #3, Hereford); May 19, 2025 (Mesquite Trail, Palo Duro Canyon State Park); May 27, 2025 (Pond #1, Happy); May 28, 2025 (Pond #2, Canyon) Created in BioRender. Butler, E. (2025) <https://BioRender.com/eoic69>



A view inside Palo Duro Canyon State Park. Palo Duro Canyon is the second largest canyon in the United States and is 10 mi from WTAMU.

RESULTS

Our research team was able to contact each community and collect at least one wastewater sample from all three cities and the State Park. A sample of results from the sampling campaign are shown in the "Sample Results" section. I have included the collection date and location for each sample.



Ground photo of a wastewater pond in Hereford.



Subsurface leach field at Palo Duro Canyon State Park.



A WTAMU grad student collects wastewater samples at one of the wastewater ponds in Happy.



Ground photo of one of the wastewater ponds in Canyon.

CONCLUSION AND NEXT STEPS

The initial sample collection campaign across the four different communities has resulted in an extended study planned for this summer. Two of our students will also be leveraging this work towards course credit. Our next step is to expand our work to measure other analytes of interest to the cities and the State Park.

A few key conclusions for prospective cities and students are as follows.

- Prospective cities** must know that while regional institution partners are capable of conducting sample analysis in wastewater, active sample collection and analysis is contingent on student availability. Cities should also expect result dissemination to take some time, as initial sample collection periods will focus on training students in sample collection and analysis methods using real-world samples.
- Students** should understand that a sampling program provides a valuable opportunity to contribute to meaningful and impactful research that positively affects the communities near their institution. In addition, student participation is one of the key reasons as to why communities are willing to partner with researchers at an institution. The communities at large are willing to support the regional institution, particularly in initiatives that bolster student success.

ACKNOWLEDGEMENTS:

I would like to thank our sponsor, National League of Cities (NLC), for providing financial support for this work.

I would also like to thank the City of Canyon, City of Happy, City of Hereford, and Palo Duro State Park for granting us access to their wastewater systems. We look forward to continuing our partnership and exploring the measurement of other analytes in the near future.

Finally, special thanks to WTAMU students, Desmond Aryee, Katelyn Kapman and, Olivia Pearson for their hard work on this particular project. Looking forward to continuing this work with you this summer.