# Environmental and Water Resources Engineering and Center for Water and the Environment Seminar Series Presents:

**Thursday, March 13th 2025, 3:30-4:30pm, ECJ 1.324**

*Zoom Link: https://utexas.zoom.us/j/94105241294*

## Investigation into Carbon, Phosphorus and Nitrogen Loadings and Effects of Nitrogen-Reducing Treatment Units for On-Site Sewage Facilities in the City of Austin


Eric Jenkins

*Current M.S. in Environmental and Water Resources Engineering Student*

*Advisor: Dr. Matthew Bartos*



**Abstract:** With an increase in harmful algae blooms occurring more frequently, causing hazardous conditions for both aquatic and terrestrial life as well as financial losses there is a need to quantify potential polluters. There can be many contributors that can cause these harmful algae blooms, and this study focuses on analysis of Austin's local on-site septic systems and their constituent contribution to Austin's water bodies. Selected homeowners with on-site septic systems using the following type of systems, conventional bed, nitrogen reduction, aerobic sub-surface drip irrigation and leach chambers, throughout the city of Austin were chosen. The data collected was obtained through the use of suction lysimeters placed on the edge of leach fields and additional grab samples from primary tanks for nitrogen reduction. This presentation will explore the process and procedures taken for site selection and sampling, and in addition explore future hydrological transport modeling recommendations for the City of Austin.


## Characterizing Trichloroethylene Fate and Transport in Low-Permeability Zones: Insights from Abiotic Reactions with Ferrous Ions

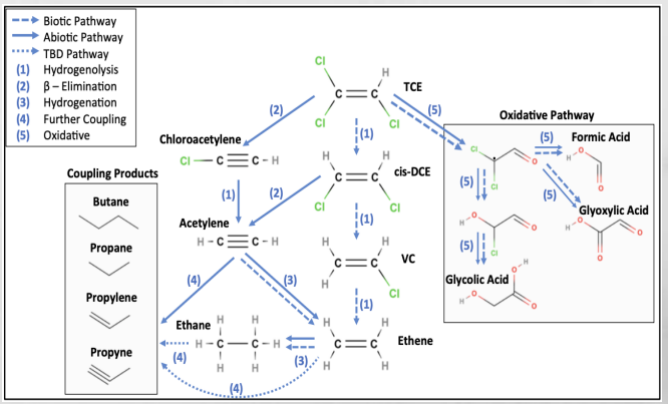

Shenyi Dai

*Current M.S. in Environmental and Water Resources Engineering Student*

*Advisor: Dr. Charles Werth*



**Abstract:** Trichloroethylene (TCE) persists in groundwater due to back diffusion from low-permeability zones (LPZs), posing challenges for long-term remediation. Understanding abiotic transformation processes with reactive minerals within these zones is essential for developing effective remediation strategies. This study quantifies the transformation products of TCE in LPZ clays and evaluates the role of ferrous ion (Fe(II)) speciation in promoting abiotic reactions. A multi-step Fe(II) speciation protocol was implemented to extract aqueous, ion-exchangeable, adsorbed, and structural Fe(II), each of which influences hydroxyl radical (·OH) production. Additional experimental approaches include Gas Chromatography (GC) and High-Performance Liquid Chromatography (HPLC) analysis to track TCE transformation products. The findings aim to contribute to a deeper understanding of TCE degradation mechanisms in LPZs and assess their feasibility for long-term natural attenuation and site remediation.


**EWRE Seminar Committee Members: Becky Cantrell, Abby Chapman, Connor Coolidge, Hiromu Koyama, and Azalea Norwood**
**Supervising Faculty: Dr. Lina Sela**