

Collection of real-world RV park and ATU data

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Summary:

This project addresses two topics defined in the 2021 Texas Onsite Grant Program (TOGP) Request for Grant Applications (RFGA). These include Topic 2.3.1 **(a)** addressing wastewater challenges at Recreational Vehicle (RV) parks and Topic 2.3.3 **(b)** focusing on Aerobic Treatment Unit (ATU) operation and performance in the real world, including sampling and new data.

- a.** For many reasons RV park usage in Texas has expanded beyond seasonal, short-term “camping” stays of a few days or weeks to semi-permanent, multiple months stays and full-time residencies. As a result, RV parks are offering an increasing number of amenities beyond traditional facilities such as water, electricity, and a dump station. RV park owners and regulators are now experiencing increases in design challenges, compliance issues, operational problems, and system malfunctions. RV park stay length, combined with expanded amenities, may be affecting waste stream quantity and quality through patron usage associated with bathing, cooking, and laundering activities. This study will monitor defined RV park waste stream configurations to determine the organic loading associated with stay length and amenity type. Influent and effluent from five amenity configurations (RV only, public bathroom, group kitchen, laundry facility, cabin/tiny homes) will be examined at parks considered to be short-term and long-term usage types. Matching OSSF type (septic or aerobic) between short and long-term usage type park comparisons will be made where possible but will not be considered a priority. Each park waste stream will be monitored over a 4-week period. Daily influent will be evaluated for flow volume, BOD₅ concentration, and TSS concentration in order to estimate organic loading associated with stay length and amenity type. Daily effluent will be evaluated for BOD₅ and TSS to determine if the systems meet state treatment requirements found in Title 30 of the Texas Administrative Code (TAC) Chapter 285. Composite, 24-hour, samples will be collected using automated water samplers and analyzed in a contract laboratory to provide quality assurance. Up to 16 influent and effluent samples will be collected from each system during the 4-week monitoring period.
- b.** Permit records indicate aerobic treatment units (ATUs) are the most commonly used OSSF treatment method in Texas and are increasing. Real-world field data is needed to determine if the minimum treatment requirements, found in 30 TAC § 285.91(4), are being achieved by these systems. This study will collect and analyze 50 residential and 50 non-residential (multiple family or commercial) ATU effluent samples from currently operating ATUs produced by different manufacturers and adequately represent the industry. All samples will be analyzed for BOD₅, TSS, and Residual Chlorine (RC). Up to 10% (i.e., 5 residential and 5 non-residential) samples may be assessed for Ammonia Nitrogen (NH₃N) Nitrate/Nitrite Nitrogen (NO₂/NO₃N), Total Kjeldahl Nitrogen (TKN), and Oil and Grease (O&G). Samples will be analyzed in a contract laboratory to provide quality assurance. Electronic data formats will be standardized and stored in a relational database.

Goals:

- Characterize RV park organic loadings based on stay length and amenity usage behaviors
- Determine if RV park OSSF effluent meets state treatment requirements
- Characterize residential and non-residential effluent from representative ATUs
- Determine if representative ATU effluent meets state treatment requirements

Objectives

- Monitor 5 short-term and 5 long-term RV park influent and effluent streams for a 4-week period at parks offering different amenity configurations including RVs only, and RVs combined with public bathrooms, group kitchen, laundry facility, and cabins/tiny homes
- Measure and report RV park influent flow volumes, BOD₅ concentrations, and TSS concentrations and effluent BOD₅ concentrations and TSS concentrations
- Collect 100 ATU effluent samples consisting of 50 residential and 50 non-residential (multi-family or commercial) from ATUs representing a variety of manufacturers
- Measure and report ATU BOD₅, TSS, and Residual Chlorine (RC) concentrations
- Measure and report NH₃N, NO₂/NO₃N, TKN, and O&G for 10% of ATU samples (5 residential samples and 5 non-residential samples)

Research Questions:

- There are no research questions associated with this project

Deliverables:

1. RV park and ATU data sets in spreadsheet or relational database format
2. Quarterly progress reports and a final report describing all results and findings