Contract# 0089
Matagorda Bay Mitigation Trust

Texas A&M University at Galveston
200 Seawolf Parkway, Galveston, TX 77554

**PROGRESS REPORT**

**NOVEMBER 30, 2025**

# Project title: Assessment of groundwater quality and dynamics near Formosa plant and Alcoa Superfund Site, Lavaca Bay

**Submitted to:**
Matagorda Bay Mitigation Trust

**Performing Laboratory:**

Texas A&M University at Galveston

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# Assessment of groundwater quality and dynamics near Formosa plant and Alcoa Superfund Site, Lavaca Bay

**Personnel**

**Principal Investigators:**

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**Consulting MBMT Project Coordinator:**

Mr. Steven J. Raabe

**Location(s):**

Texas A&M University at Galveston

**Project Duration:**

01 September 2025 – 31 August 2028

**Objectives:**

Objectives 1: Assess the extent of hydrologic connectivity between aquifers and surface water in Lavaca Bay.

Objectives 2: Quantify the contaminant concentration in groundwater and identify the sources of pollutants.

Objectives 3: Conduct public education outreach to well owners and stakeholders regarding groundwater pollutants and their wells' susceptibility to contamination.

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# 1. INTRODUCTION

## 1.1 Background

This project investigates groundwater quality and subsurface contaminant transport near the Formosa Plastic Corporation and Alcoa Superfund Site in Lavaca Bay, where groundwater quality has not been previously tested. This project addresses the funding priority of Environmental Research by examining groundwater recharge-discharge processes and contaminant transport in a heavily industrialized area, as well as the associated public health risks. The knowledge gained will inform coastal management and water resource strategies, and aid state organizations in establishing regular monitoring protocols and offering well protection measures to local communities.

In this first progress report (September 1st, 2025 – November 30th, 2025) we provide a list of key accomplishments as per the first quarter of Year 1 of the project.

# 2. KEY UPDATES

Objectives 1: Assess the extent of hydrologic connectivity between aquifers and surface water in Lavaca Bay.

- Field activities for this objective are scheduled for Summer 2026. We have initiated discussions with the TAMUG research vessel team regarding a week long intensive boat survey; instruments and materials required for this fieldwork are already available.
- We have coordinated with San Antonio Estuarine Waterkeeper (Ms. Diane Wilson) and the Matagorda Bay Foundation (Mr. William Balboa) regarding future sampling needs, including boat access around the Port of Calhoun, the Alcoa Superfund Site, and the Formosa facility.
- Personnel hiring has been completed, including a graduate student assigned to Objective 1 under the supervision of Dr. Adyasari.

Objectives 2: Quantify the contaminant concentration in groundwater and identify the sources of pollutants.

- We received Institutional Review Board (IRB) approval from Texas A&M University to conduct research involving private well owners and community outreach, including approval of all recruitment materials.
- Approved recruitment materials have been distributed through local Facebook groups, resulting in the successful enrollment of 16 private well owners in Port Lavaca and 12 in the surrounding area of Matagorda Bay (Palacios, Matagorda) for the first sampling phase (November-December 2025). Recruitment materials were also distributed at the recent People's Microplastic Conference in Port O'Connor.
- Consumables, reagents, and other analytical supplies required for laboratory measurements have been purchased.

- Personnel hiring has been completed, including a graduate student assigned to Objective 2 under the supervision of Dr. Hala.

Objectives 3: Conduct public education outreach to well owners and stakeholders regarding groundwater pollutants and their wells' susceptibility to contamination.

- Outreach activities will take place toward the end of the project, informed by study results.
- A short community survey on well characteristics, water-quality perceptions, and community resilience has been developed and IRB-approved. These questions are administered during each well-sampling visit, and responses will inform the final outreach materials.

## 3. FURTHER WORK

Planned activities for the next reporting period (December 2025 – February 2026) include:

- Analyzing physicochemical parameters from groundwater sampled in November–December 2025, including total dissolved solids, pH, nutrients (nitrate, ammonia, phosphate), fecal bacteria, heavy metals, PAHs, PCBs, PFAS, and microplastics.
- Launching the second round of well-owner recruitment (e.g., via local partners) to support Summer 2026 sampling. Recruitment efforts will focus on private well owners in Olivia and the eastern side of Lavaca Bay.

## 4. REFERENCES

None reported for this progress report.

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Reviewed by:

Dini Adyasari

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Dr. Dini Adyasari, TAMUG, PI Date: 11/30/2025

Accepted by:

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Mr. Steven J. Raabe, Trustee Date: 12/01/2025