

# Ohmsett Overview, Recent Activities, and Future Plans

OSPR/Chevron Workshop  
March 27-30, 2023

**Tom Coolbaugh**  
Program/Facility Manager

**Ohmsett**  
732-866-7285  
<https://ohmsett.bsee.gov>



# Topics

- Overview/Highlights
- Tank Refurbishment
- Testing/Training
- Future Plans



One of the largest outdoor saltwater test tanks in the world

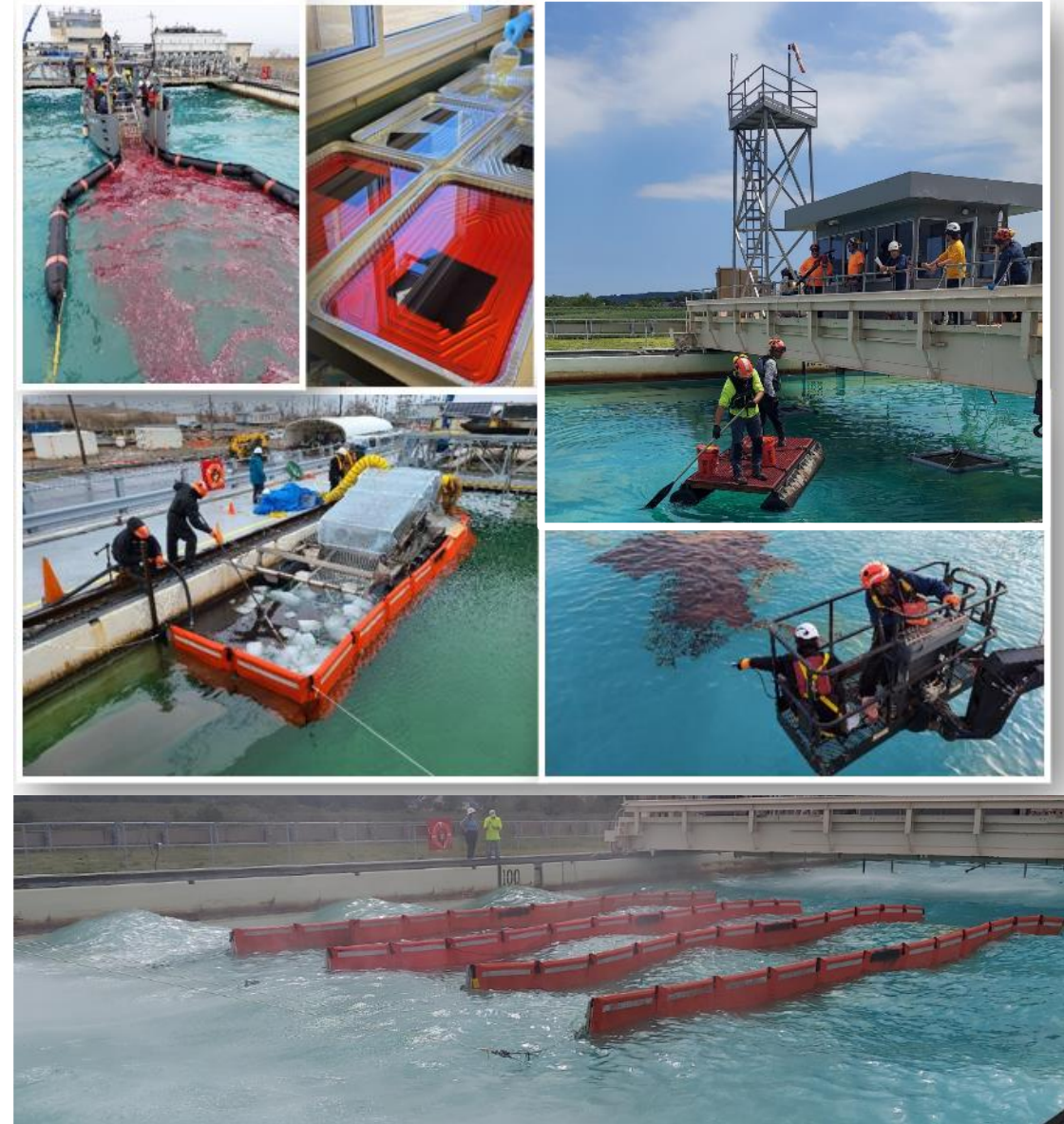
- 203 meters (667 feet) by 20 meters (65 feet) wide by 2.4 meters (8 feet) deep
- 10 million liters (2.6M gallons)
- Waves up to ~1 meter (~3 feet)
- Open ocean salinity (32 -35 ppt)
- Supported by oil analysis laboratory and fabrication workshop
- South of New York City

*Managed by U.S. Department of the Interior's Bureau of Safety and Environmental Enforcement (BSEE)  
and operated through a contract with Applied Research Associates, Inc. since September 2018.*



# Testing Capabilities

- Mechanical Recovery
  - Containment booms and skimmers, including under ice conditions
- Chemical Treatments
  - Dispersants and Herders
- Oil Behavior, Fate, and Transport
  - Dispersed and weathered oils
  - Emulsions
- Sorbent Testing
- Remote Sensing
- Wave Energy Devices
- Oil Handling
  - Storage, Pumps, Oil/water Separators
- Marine Debris Removal
  - Nurdles?



# Recent Highlights – Tank Renovation



Snapshots of the  
entire process

Short timelapse:

<https://www.youtube.com/watch?v=MyV2EQOEYZ4>



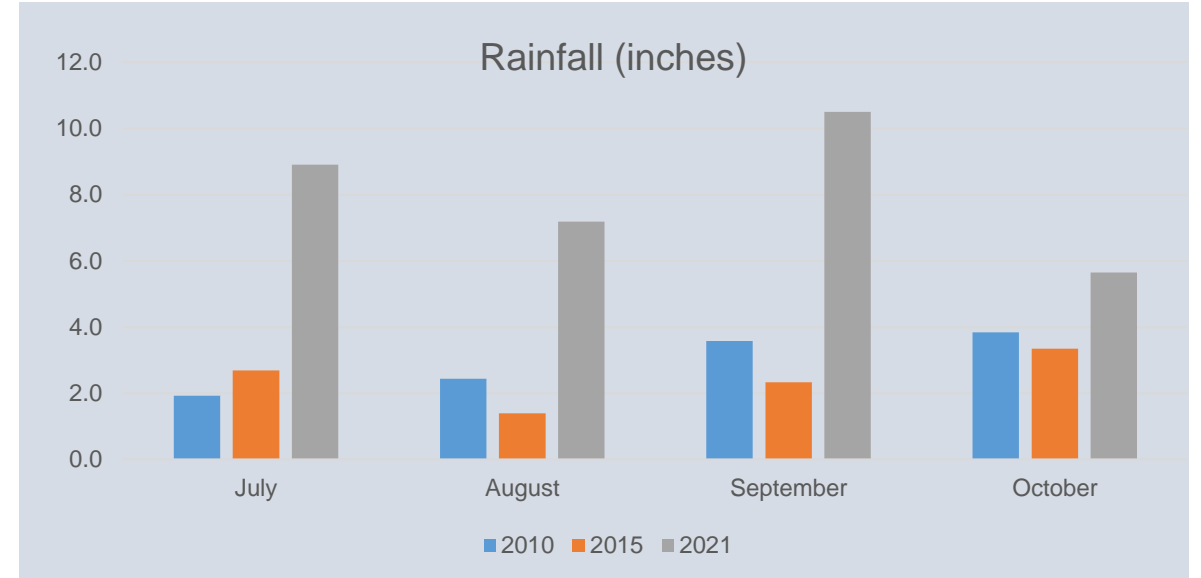
# Tank Refurbishment Project

- Major accomplishments include:
  - Structural repairs to reinforced concrete tank and structural elements
  - Restored structural integrity of the main bridge: significant future value
  - Provided a smooth surface to the tank: ease of cleaning
  - Rails for the bridges were cut into sections to allow easier removal in the future
  - Sensor ports to monitor tank water quality and two wet access port were installed for future equipment



# Tank Refurbishment – Water Management Challenge

- Very wet season
  - Each inch of rain equates to 27k gallons of water
- Rainwater was discharged in accordance with NJDEP permit requirements
  - ~1,000,000 gallons were discharged to the local sewer authority



# Tank Refurbishment – Concrete Surface Preparation

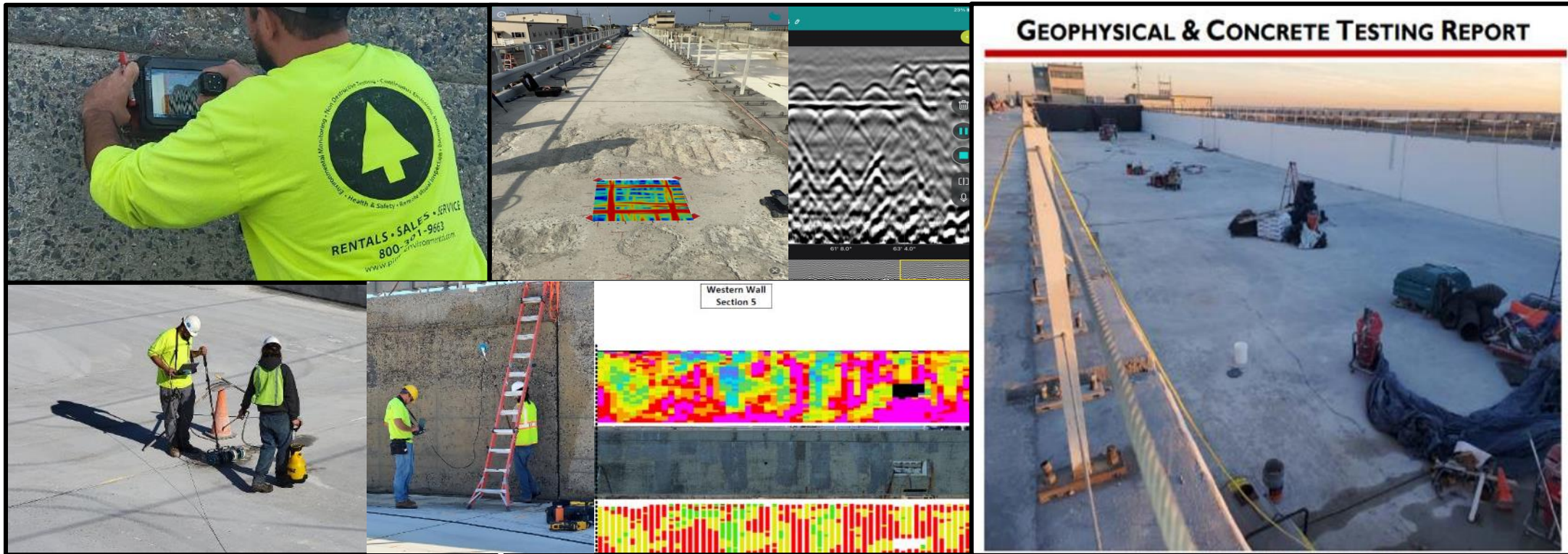
- Removed coatings and previous superficial concrete repairs
- Filled cracks





# Tank Refurbishment – Concrete Assessment

- GPR and Electromagnetic Induction techniques
  - Identified and documented areas of interest
  - Reference point for the future





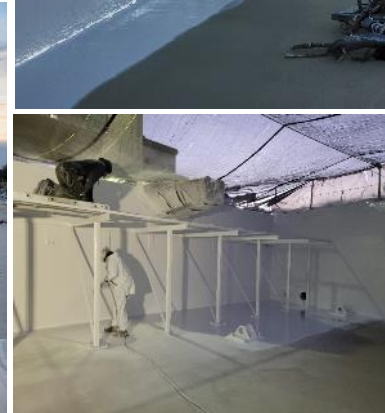
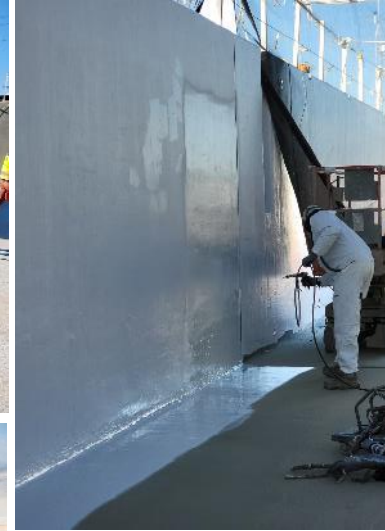
# Tank Refurbishment – Structural Steel Repairs

- Three steel bridges removed and sand-blasted to bare metal
  - Tons of rusted steel were removed and compromised steel exposed
- Significant repairs to restore and improve integrity



# Tank Refurbishment – Tank Painting

- Priming and painting was performed in all weather conditions, including winter temperatures
  - Low-temperature coatings were specific, i.e., 35°F
- Painted areas were protected from the sun (canopy) and cold (heating blankets)
- Wall grid markings and meter references were added





# New Equipment

- Laboratory
  - Light scattering detectors, UV/Vis spectrometer, variable temperature viscometer, oil in water and water in oil analyses
  - Others to come include a variety of fluorescence sensors and a new silhouette camera
- Facility
  - Telehandler
  - Tricycles (2)
  - Crew-cab truck – for site-related support



# Post Tank Refurbishment – The First Full-Scale On-Water Test

- First major on-tank test was with a NOFI Current Buster 4 in June 2022
- Used the full capability of the wave tank



OHMSETT FACILITY  
NWIS LARLE WATERFRONT  
ROUTE 36, BUILDING B-26  
LEONARD, NJ 07737  
PH 732-866-2183

ABOUT US OIL SPILL RESEARCH & TESTING RENEWABLE ENERGY TESTING TRAINING TESTING & TRAINING SCHEDULE VIDEOS PUBLICATIONS FOR STUDENTS

### Testing and Training Schedule

Home > Testing and Training Schedule

SEE A DATE YOU WOULD LIKE TO RESERVE? CALL US AT 732-866-7285

2021 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec 2023

June 2022

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
29(28)	May 30	31	1 Jun	2	3	4
			BS&H Project 1127: Advancing Skimmer Test Method Working Group			
5(4)	6	7	8	9	10	11
			NOFI Current Buster 4			

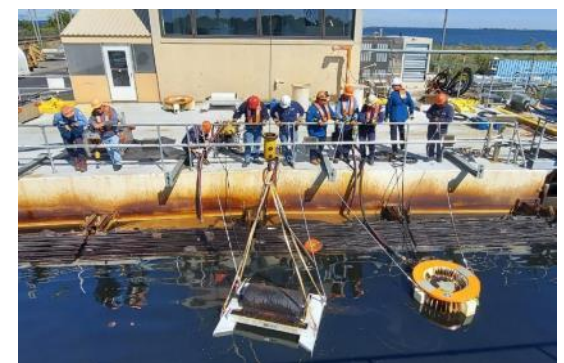
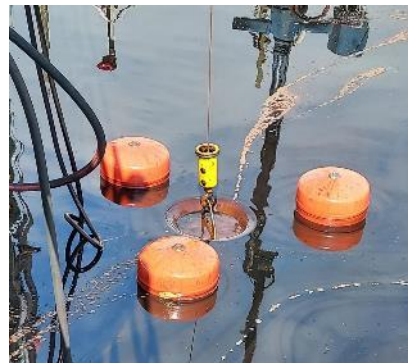
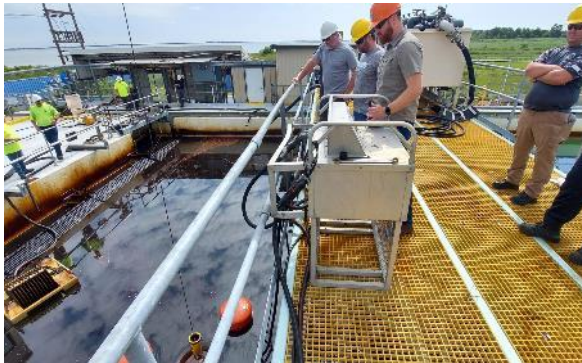


<https://www.youtube.com/watch?v=lecPsOwmqV8>



# Post Tank Refurbishment – Training

- US Coast Guard
  - Two, five-day Oil Spill Response Training sessions
  - Texas A&M National Oil Spill Control School
    - Three-day spill response course with off-site SCAT session
- Clean Harbors Cooperative/Phillips 66
  - Two-day training with Bayway (NJ) refinery staff





# Other Recent Tests

1. Scaled Boom Study
2. Emulsion Study
3. Skimmer Vessel
4. Oil Thickness Measurement
5. ISB Prototype





# Dispersant Testing / Demonstration

One of the few places in the world where oil spill dispersants may be applied to crude oil for:

- Demonstration purposes, i.e., the visible difference between dispersed and undispersed surface slicks
- Testing of oil dispersibility
  - Dispersant effectiveness
  - Ability of instruments to characterize resulting oil droplets, e.g., fluorescence and droplet size distributions
- Evaluation of new delivery methods
  - subsurface application of dispersants to flowing oil



# Dispersant Testing /Baffled Flask

In-house capability to measure dispersant effectiveness:

- Access to dispersants and the requisite test equipment, able to perform what is now a standard test

ASTM F3251-21 ①

## Standard Test Method for Laboratory Oil Spill Dispersant Effectiveness Using the Baffled Flask

### Significance and Use

5.1 A standard test is necessary to establish a baseline performance parameter so that dispersants can be compared, a given dispersant can be compared for effectiveness on different oils, and at different oil weathering stages, and batches of dispersant or oils can be checked for effectiveness changes with time or other factors. This test method provides a second test at higher mixing energy in addition to the Swirling Flask (Test Method F2059).

5.2 Dispersant effectiveness varies with oil type, sea energy, oil conditions, salinity, and many other factors. Test results from this test method form a baseline at high mixing energy, but are not to be taken as the absolute measure of performance at sea. Actual field effectiveness could be more or less than this value.

5.3 Many dispersant tests have been developed around the world. This test has been developed in recent years and provides higher mixing energies compared to other laboratory scale tests.

➤ [Mar Pollut Bull. 2018 Apr;129\(2\):609-614. doi: 10.1016/j.marpolbul.2017.10.038. Epub 2017 Nov 6.](#)

## Qualification of oil-spill treatment products – Adopting the Baffled Flask Test for testing of dispersant efficacy in the UK

Roxana Sührling<sup>1</sup>, Andy Smith<sup>2</sup>, Heather Emerson<sup>2</sup>, Denise Doran<sup>2</sup>, Phil Mellor<sup>2</sup>, Mark F Kirby<sup>2</sup>, Bernard Christie<sup>3</sup>

Affiliations + expand

PMID: 29102073 DOI: [10.1016/j.marpolbul.2017.10.038](#)

### Abstract

The UK Marine Management Organisation (MMO) tasked the Centre for Environment, Fisheries & Aquaculture Science (Cefas) with reviewing the current UK dispersant efficacy testing procedures. The aim was to identify possibilities to increase standardisation, improve health and safety performance and explore harmonisation possibilities with international dispersant efficacy testing procedures. The US EPA 'Baffled Flask Test' (BFT) was adopted, implemented and validated as a new standard method in the UK. The outputs from this study suggest that dispersant efficacy results from the adopted BFT test and the currently used protocol are in a similar range and results presented by the US EPA. As a result, the transition to the adopted BFT test will require minimal changes in the assessment of the results or reporting and increase harmonisation between tests used in the UK and North America.

July 1, 2004 – January 31, 2006

Final Report

LABORATORY TESTING TO DETERMINE DISPERSION PREDICTABILITY  
OF THE BAFFLED FLASK TEST (BFT) AND SWIRLING FLASK TEST (SFT)

Submitted to:

US Department of the Interior

Submitted by:

George A. Sorial, Task Order Leader

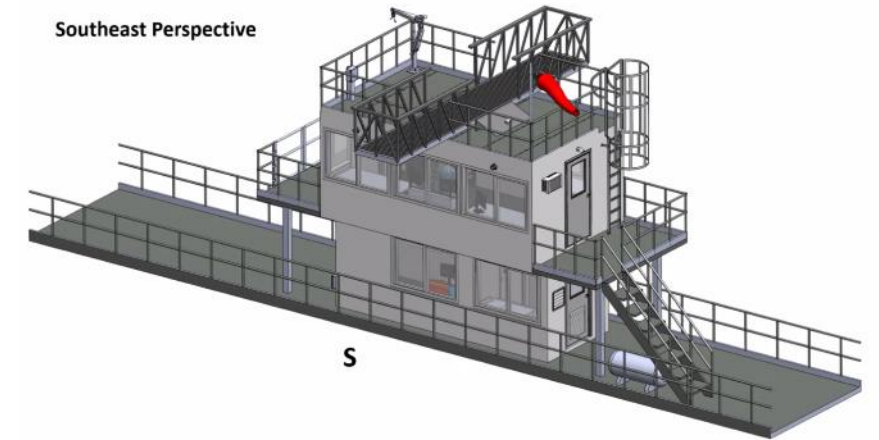
Department of Civil and Environmental Engineering  
University of Cincinnati  
Cincinnati, OH 45221-0071





# Potential Ohmsett Facility Enhancements

- Enhancements include:
  - Main Bridge Control Room with greater functionality and space for staff and clients
  - Small Scale Wave / Flume Tank (ca 25k gallons) - could provide significant capability enhancement to the facility, e.g., fresh water, non-Cl, flexibility and ease of use
  - Enhanced Beach design with improved wave dampening
- Goal is to define workable and cost-effective solutions that provide significant value consistent with a long-term vision of technical excellence



Can build upon the recently refurbished, solid bridge structure

# Thank You.



[tcoolbaugh@ara.com](mailto:tcoolbaugh@ara.com)

732-866-7285

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