



## **EREF Awards Two Grants for Solid Waste Research**

**Raleigh, NC (October 29, 2020)** – The Board of Directors of the Environmental Research & Education Foundation (EREF) are pleased to announce the award of 2 new research grants.

The following projects have been funded in 2020:

### **Non-Recyclable Plastics to Pavements**

**Investigator:** University of Illinois Urbana-Champaign

**Award Amount:** \$161,075

This research seeks to create high-value and high-volume products from plastic waste for bitumen (asphalt binder) replacement in pavements. The bitumen replacement market is a potential repurposing for large quantities of waste plastics. It addresses an urgent economic and environmental need for plastic recycling as well as the transportation industry. With 4-5% replacement of bitumen, this market has the potential to consume 1 million tons of waste plastics out of the 26 million tons that go to landfills in the US. Also, the study goal is aligned with the global emphasis on enhancing transportation infrastructure sustainability. Moreover, asphalt pavements are 100% recyclable; therefore, plastic waste will remain in a recycling circular loop. Plastic waste that would typically be landfilled will be formulated for incorporation in bitumen that meets performance specifications for durability. Through manipulation of the chemical and molecular composition of waste plastics, current challenges, including sorting and processing of different plastics, storage instability and compatibility between bitumen and various plastics will be addressed.

The objectives of this study are as follows:

1. Develop compatibility and blending methodology of various plastic waste plastic for bitumen modification.
2. Investigate the suitability of plastic types and mixed plastics for modifying bitumen.
3. Determine the storage stability of plastic waste modified bitumen.
4. Perform chemical and rheological characterization of plastic-modified bitumen.
5. Quantify environmental benefits using life cycle assessment (LCA) for plastic-modified bitumen.

### **Techno-Economic Evaluation of Supercritical Water Oxidation for Landfill Leachate and Condensate Management**

**Investigator:** Duke University

**Award Amount:** \$152,000

Landfill leachate and condensate management can be a major cost of operating a landfill and they are an important contingent liability. For example, per- and polyfluoroalkyl substances (PFAS) are now found in many landfills and cause great concerns to owners and operators. Supercritical water oxidation (SCWO) is a game-changing treatment technology that could provide superior treatment with better economics. Deshusses' lab is leading the U.S. in SCWO technology research.

The objectives of this project are to demonstrate the technical and economic feasibility of using SCWO at landfills by:

1. Demonstrating treatment of representative landfill leachates, condensates and concentrated liquids, such as leachate reverse osmosis (RO) concentrate, in our pilot 1 ton/day SCWO system with specific focus on PFAS and emerging contaminants.
2. Conducting a detailed economic analysis of using SCWO at landfills at a larger scale. This will include an early assessment of scale and SCWO system throughout. If this assessment indicates that concentration of leachates and condensates (e.g., using reverse osmosis) followed by SCWO is the preferred route for treatment, the project will focus on treatment of concentrated liquids such as RO leachate concentrates.

3. Exploring treatment synergies (e.g., hazardous wastes, PFAS contaminated sludge, selected organic wastes) that may be co-treated with leachate/condensate or RO concentrates and that may affect the economic outcome.

**Pre-proposals are required prior to submitting a full proposal.** EREF invites investigators to submit pre-proposals pertaining to the topics outlined on the “How to Apply for a Grant” page on EREF’s website. **The next pre-proposal deadline is December 1, 2020.** For more information regarding EREF’s Research Grants Program, please visit [erefdn.org](http://erefdn.org) or e-mail [proposals@erefdn.org](mailto:proposals@erefdn.org).

*EREF is a 501(c)3 class charity that funds and directs scientific research and educational initiatives for waste management practices to benefit industry participants and the communities they serve. For more complete information on EREF funded research, its scholarship program and how to donate to this great cause, visit [erefdn.org](http://erefdn.org).*

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