



**Date Posted: Monday, July 8, 2019**

**REQUEST FOR PROPOSALS (RFP)**

***Evaluation of Existing Source Separated Organic Feedstock Pre-Treatment and Management Practices (RFP 5037)***

**Due Date:** Proposals must be received by 2:00 pm Mountain Time on Tuesday, September 24, 2019

**WRF Project Contact:** Stephanie Fevig, [sfevig@waterrf.org](mailto:sfevig@waterrf.org)

**Project Sponsors**

This project is *funded* by The Water Research Foundation (WRF) as part of the Foundation's Research Priority Program.

**Project Objectives**

- Conduct a global literature review and survey on feedstock pre-treatment technologies and management strategies, including the characteristics of the materials resulting from the application of various technologies with a focus on applicability and implementation in the U.S.
- Evaluate existing pre-treatment technologies and systems including throughput, costs, batch or continuous mode, O&M requirements, footprint, reliability (uptime/downtime), operability, final end product quality, etc., with a focus on municipal wastewater anaerobic digester operability and maintainability.
- Perform a review of a minimum of six wastewater facility case studies that provide a broad view of the industry and an overview of practical approaches for pre-treatment to help facilities identify appropriate pre-treatment technologies and strategies to meet their needs.
- Engage with utility subscribers through the relevant LIFT Focus Groups and other LIFT activities.

**Budget**

Proposals may request up to **\$150,000** in WRF funds for this project. WRF funds requested and total project value will be an evaluation criteria considered in the proposal selection process.

**Background and Project Rationale**

A shift towards resource recovery and renewable energy is leading water resource recovery facilities (WRRFs) to evaluate co-digestion, or in some cases dedicated digestion, with residential and commercial food waste from both pre-consumer and post-consumer waste (source separated organic) feedstocks and WRF identified this need as one of its Research Priority Areas. Source separated organic feedstock is

defined as originating from commercial generators such as restaurants (excluding grease), commercial kitchens and cafeterias, grocery stores, food distribution centers, and residential generators separated from other wastes at the source. Existing research on source separated organics co-digestion focuses on anaerobic digestion operational strategies and processes, and there is minimal information/experience on feedstock pre-treatment, characterization and management of contaminants, overall pre-treatment implementation and monitoring, and assessment of pre-treatment impacts on anaerobic digestion performance.

The overarching goal of this Research Area is to provide WRRFs with the guidance, tools, and best practices to develop and manage a source separated organics co-digestion program. The first three projects in this research program are completed or underway and include a framework of best practices for co-digestion (#4712/ENER20W17), developing a business case for food waste co-digestion (#4792/ENER19C17), and characterization and contamination of source separated organic feedstocks (WRF #4915). The purpose of this subsequent project is to review existing pre-treatment technologies and to evaluate these technologies in terms of their benefits and challenges.

Source separated organic feedstocks can be highly variable in terms of consistency and chemical/physical characteristics. For easy conveyance and feeding to a digester, the material must be conditioned or pre-treated into a homogeneous and pumpable form. Pre-treatment of feedstocks is required not only to protect the conveyance and digester equipment from harmful debris, but also to remove contaminants that could negatively impact digester operation (e.g., mixing, foaming, etc.), end products (e.g., biogas, biosolids) and return streams. WRF's project ENER8R13 conducted a survey of wastewater facilities operating high-strength waste co-digestion and found that onsite pre-treatment systems may include rock traps, magnetic separators, depackaging equipment, hammer mills, screens, grinders, macerators, degritters, hydro-pulpers, and pumping equipment. This study also determined that the general category of waste received drives the types of pretreatment required and matching the waste with the pretreatment requirements is key (WRF 2017). Although this study identified specific pre-treatment equipment in use at case study facilities, it was not specific to source separated organic feedstocks and did not go into detail regarding their pre-treatment strategies.

Managing and operating a pre-treatment system can be the most challenging aspect of running a co-digestion program and may be the key reason why most facilities shy away from accepting organic wastes. Whether a WRRF accepts raw food waste from a local hauler or a more manageable product like a slurry from a third party, it is imperative for the facility to know the benefits and challenges of pre-treating these types of feedstocks. This project aims to provide facilities with an understanding of what technologies are currently available, what they need to consider when selecting them as part of their pre-treatment program, and how to develop a pre-treatment management strategy based on lessons learned in the industry. The overall benefit of this project is to provide facilities the knowledge and confidence to develop an effective pre-treatment management strategy that supports their program goals and supports their community in beneficially reusing organic waste products.

### **Research Approach**

This project will be Phase 1 of a phased approach to review and understand the pre-treatment technologies and management strategies required for co-digestion of source separated organic feedstocks.

1. Literature Review and Survey of Existing Technologies and Management Strategies

- Pre-treated feedstocks include materials treatment taking place both onsite and offsite of a WRRF or a combination. Separate research is currently being conducted on feedstock characterization under WRF #4915. The focus of this project will be to document characteristics and digester impacts of the materials produced from pre-treatment processes. The research team is strongly encouraged to review the WRF #4915 literature review and survey to build upon that work and not duplicate effort.
  - Global review with consideration of applicability at U.S. wastewater facilities.
  - Gap analysis of existing references including industry publications (WERF, WEF, WRF, etc.) and noted references.
2. Evaluation of Existing Technologies and Management Strategies
- Evaluation should include the following criteria, at a minimum:
    - Number and location of installations.
    - Onsite, offsite, or combination of pre-treatment processes. Identify hauling distance or radius of haulers.
    - Equipment throughput.
    - Equipment and estimated O&M costs.
    - Batch or continuous operation.
    - O&M requirements.
    - Durability/robustness.
    - Applicable final end product quality/standards.
    - Equipment footprint.
    - Training/staff educational requirements.
    - Operability including uptime/downtime.
    - Maintainability.
    - Cost-benefit.
    - Connection(s) for odor control management systems.
  - This evaluation will only look at equipment or pre-treatment systems that process the feedstock. Storage, receiving area ancillary equipment, etc., will not be part of this review.
  - Operator equipment reviews, where available. Questions may include: What works? What's tricky? What do they hate that needs a better solution or research? What would they do differently? These reviews will be a requirement for the WWRFs selected for the case studies task.
  - This task includes development of logic diagram or decision tree as a deliverable.
3. Case Studies with wastewater industry focus (minimum of 6)
- Facilities would be identified from the results of the previous tasks for further examination. Project Advisory Committee (PAC) will review and approve the short list of facilities provided by researchers prior to proceeding with the case studies (this should be included as a milestone in the project schedule).
  - Include a spectrum of facilities with an array of pre-treatment technologies and systems that range from:
    - Accepting only offsite pre-treated slurries to receiving and pre-treating raw feedstocks onsite.
    - Having an established, long-running food waste co-digestion program to a new program that is less than 2-years old.
    - Small to mid-size to large facilities.
    - Accepting source separated organics to only the organic fraction of municipal solid waste.

- International studies will need to include information on how the system may be different compared to U.S. municipal infrastructure designs and detail what would need to be done to apply similar technologies or strategies in the U.S.
- Conduct a more in-depth interview building on Item 2 with a summary of highlights. This task includes development of an interview template as a deliverable.
- Provide list of requirements/standards that facilities use to evaluate and accept feedstocks.

### **Expected Deliverables**

All items listed below are required to be reviewed and approved by the PAC before preceding to the next tasks. A scheduled call with the PAC will also be required for each major task.

- Survey/interview template(s)
- Logic diagram/decision tree
- Literature review and survey
- WRF and LIFT presentations
- Report including case studies but research team may propose alternative communication pieces for consideration.

### **Communications Plan**

Please review WRF's *Project Deliverable Guidelines* for information on preparing a communications plan. The guidelines are available at <http://www.waterrf.org/funding/Pages/proposal-guidelines.aspx>. Conference presentations, webcasts, peer review publication submissions, and other forms of project information dissemination are typically encouraged.

### **Project Duration**

The anticipated period of performance for this project is **12-18 months** from contract start date.

### **References and Resources**

The following list includes examples of research reports, tools, and other resources that may be helpful to proposers. It is not intended to be comprehensive, nor a required list for consideration.

Avfall Sverige, 2014. "New pre-treatment technology for increased concentration of nutrients in the digestate"; Nya förbehandlingstekniker för ökad concentration av växtnäring i biogödsel; Rapport B2014:02.

WRF, 2017. WRF Project ENER8R13. Lessons Learned: Developing Solutions for Operational Side Effects Associated with Co-Digestion of High Strength Organic Wastes.

WRF, 2018. WRF Project ENER20W17/4973. Advancing Anaerobic Digestion of Wastewater Solids and Food Waste for Energy and Resource Recovery: Science and Solutions – A Framework for the Practice of Co-Digestion

*WRF projects that are referenced, but are currently not published can be requested from the Research Manager if a draft is available.*

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### **Proposal Evaluation Criteria**

The following criteria are used to evaluate proposals:

- Understanding the Problem and Responsiveness to RFP (maximum 20 points)
- Technical and Scientific Merit (maximum 30 points)
- Qualifications, Capabilities, and Management (maximum 20 points)
- Communication Plan, Deliverables, and Applicability (maximum 15 points)
- Budget and Schedule (maximum 15 points)

### **Proposal Preparation Instructions**

Proposals submitted in response to this RFP must be prepared in accordance with the WRF document *Guidelines for Research Priority Program Proposals*. The current version of these guidelines is available at <http://www.waterrf.org/funding/Pages/proposal-guidelines.aspx>, along with *Instructions for Budget Preparation*. The guidelines contain instructions for the technical aspects, financial statements, indirect costs, and administrative requirements that the applicant must follow when preparing a proposal.

### **Eligibility to Submit Proposals**

Proposals will be accepted from domestic or international entities, including educational institutions, research organizations, governmental agencies, and consultants or other for-profit entities.

WRF's Board of Directors has established a Timeliness Policy that addresses researcher adherence to the project schedule. The policy can be reviewed at <http://www.waterrf.org/funding/Pages/policies.aspx>. Researchers who are late on any ongoing WRF-sponsored studies without approved no-cost extensions are not eligible to be named participants in any proposals. Direct any questions about eligibility to the WRF project contact listed at the top of this RFP.

### **Administrative, Cost, and Audit Standards**

WRF's research program standards for administrative, cost, and audit compliance are based upon, and comply with, Office of Management and Budget (OMB) Uniform Grants Guidance (UGG), 2 CFR Part 200 Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, and 48 CFR 31.2 Contracts with Commercial Organizations. These standards are referenced in WRF's *Guidelines for Research Priority Program Proposals*, and include specific guidelines outlining the requirements for indirect cost negotiation agreements, financial statements, and the Statement of Direct Labor, Fringe Benefits, and General Overhead. Inclusion of indirect costs must be substantiated by a negotiated agreement or appropriate Statement of Direct Labor, Fringe Benefits, and General Overhead. Well in advance of preparing the proposal, your research and financial staff should review the detailed instructions included in WRF's *Guidelines for Research Priority Program Proposals* and consult the *Instructions for Budget Preparation*, both available at <http://www.waterrf.org/funding/Pages/proposal-guidelines.aspx>.

### **Budget and Funding Information**

The maximum funding available from WRF for this project is **\$150,000**. The applicant must contribute additional resources equivalent to at least 33 percent of the project award. For example, if an applicant requests \$100,000 from WRF, an additional \$33,000 or more must be contributed by the applicant. Acceptable forms of applicant contribution include cost-share, applicant in-kind, or third-party in-kind that comply with 2 CFR Part 200.306 cost sharing or matching. The applicant may elect to contribute more than 33 percent to the project, but the maximum WRF funding available remains fixed at \$150,000. **Proposals that do not meet the minimum 33 percent of the project award will not be**

**accepted.** Consult the *Instructions for Budget Preparation* available at <http://www.waterrf.org/funding/Pages/proposal-guidelines.aspx> for more information and definitions of terms.

### **Period of Performance**

It is WRF's policy to negotiate a reasonable schedule for each research project. Once this schedule is established, WRF and its sub-recipients have a contractual obligation to adhere to the agreed-upon schedule. Under WRF's No-Cost Extension Policy, a project schedule cannot be extended more than nine months beyond the original contracted schedule, regardless of the number of extensions granted. The policy can be reviewed at <http://www.waterrf.org/funding/Pages/policies.aspx>.

### **Utility and Organization Participation**

WRF encourages participation from water utilities and other organizations in WRF research. Participation can occur in a variety of ways, including direct participation, in-kind contributions, or in-kind services. To facilitate their participation, WRF has provided contact information, on the last page of this RFP, of utilities and other organizations that have indicated an interest in this research. Proposers are responsible for negotiating utility and organization participation in their particular proposals. The listed utilities and organizations are under no obligation to participate, and the proposer is not obligated to include them in their particular proposal.

### **Application Procedure and Deadline**

**Proposals are accepted exclusively online in PDF format, and they must be fully submitted before 2:00 pm Mountain Time on Tuesday, September 24, 2019.** All proposal documents must be compiled into two (2) PDF files consisting of your technical review documents and your financial review documents. All forms and components of the proposal are available in the *Proposal Component Packet* zip file on the proposal website at <https://proposals.waterrf.org/Pages/RFPs.aspx>. An FAQ and a tutorial are also available. A login is required to access the proposal website and download the packet. Proposers are encouraged to create logins and verify the validity and compatibility of the system well in advance in order to avoid last-minute errors or delays.

The online proposal system allows submission of your documents until the date and time stated in this RFP. To avoid the risk of the system closing before you press the submit button, do not wait until the last minute to complete your submission.

Questions to clarify the intent of this RFP and WRF's administrative, cost, and financial requirements may be addressed to the WRF project contact, Stephanie Fevig at (303) 347-6103 or [sfevig@waterrf.org](mailto:sfevig@waterrf.org). Questions related to proposal submittal through the online system may be addressed to Caroline Bruck at (303) 347-6118 or [cbruck@waterrf.org](mailto:cbruck@waterrf.org).

## 5037 Utility and Organization Participants

The following utilities have indicated interest in possible participation in this research. This information is updated within 24 business hours after a utility or an interested organization submits a volunteer form, and this RFP will be re-posted with the new information. **(Depending upon your settings, you may need to click refresh on your browser to load the latest file.)**

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