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REQUEST FOR PROPOSALS (RFP)

Occurrence of Legionella spp. *in Drinking Water Distribution Systems* (RFP 5156)

Due Date: Proposals must be received by **3:00 pm Mountain Time on Thursday, February 10, 2022**. This is a fast-track RFP with modified proposal requirements outlined in the Project Duration and Proposal Preparation Instructions sections.

WRF Project Contact: Grace Jang, hjang@waterrf.org

Project Sponsors
This project is co-funded by The Water Research Foundation (WRF), the American Water Works Association (AWWA), and the Association of State Drinking Water Administrators (ASDWA) as a part of WRF's Emerging Opportunities Program.

Project Objectives
- Examine the detection and occurrence of *Legionella* spp. in drinking water distribution systems.
- Elucidate the relationship between secondary disinfectant residual and observed *Legionella* spp. occurrence in the distribution system.
- Provide practical and actionable guidance to support drinking water utilities in response to positive *Legionella* spp. samples.
- Provide meaningful input to the U.S. Environmental Protection Agency's (EPA's) revisions to the microbial/disinfection byproducts (M/DBP) rules.

Budget
Applicants may request up to $206,333 in WRF funds for this project. WRF funds requested and total project value are evaluation criteria considered in the proposal selection process.

Background and Project Rationale
In January 2017, the EPA announced that the third Six-Year Regulatory Review under the Safe Drinking Water Act identified eight National Primary Drinking Water Regulations (NPDWRs) as candidates for potential regulatory revision. Five microbial-focused NPDWRs address *Giardia lamblia*, heterotrophic bacteria, *Legionella*, *Cryptosporidium*, and viruses. The agency hosted an initial two-day virtual public meeting on October 14-15, 2020, and is currently reviewing the M/DBP rule where *Legionella* spp. control is a key area of interest.

Under the current Safe Drinking Water Act, the Maximum Contaminant Level Goal (MCLG) for *Legionella* spp. is zero, and the presence of the pathogen is regulated through a treatment technique requirement. Disinfection is usually the final stage in the water treatment process to control microbial populations by maintaining disinfectant residuals through distribution systems. While several studies have

demonstrated that disinfectants can help control *Legionella* spp., an absence of direct monitoring makes it challenging to respond to questions regarding the contribution of drinking water supplies during a premise plumbing outbreak. In addition, EPA anticipates setting minimum numeric disinfectant residual levels for community drinking water systems as part of the current rulemaking process. Commentary by EPA, state primacy agencies, the Centers for Disease Control and Prevention, and experts engaged in managing *Legionella* spp. in buildings point to the value of disinfectant residual, but there is inadequate information available to demonstrate what concentration is adequate. Therefore, it is necessary to examine *Legionella* spp. occurrence and concentrations throughout public water distribution systems and evaluate the level of secondary disinfectant residual contributing to its occurrence in the distribution systems.

This study will produce critical data to help EPA and state primacy agencies in providing regulatory guidance related to *Legionella* spp. and guide utilities and the communities they serve in developing strategies that augment their contributions to Legionnaires' disease risk reduction.

Research Approach

The main objectives of this project are to examine the occurrence of *Legionella* spp. relative to the secondary disinfectant residual levels in drinking water distribution systems and to provide meaningful input to EPA's revisions to the M/DBP rules. To achieve these objectives, the proposal must clearly detail the following:

- Robust utility participation is the key to the project. Describe how you will ensure a meaningful level of participation. Include utilities of different sizes (small, medium, and large), geographical locations, and different types of disinfectants (chlorine vs. chloramine) for this study.
- Sampling and monitoring locations in distribution systems are important. Provide a detailed sampling and monitoring plan (where and how).
- Describe the detection and confirmation methods for *Legionella* spp. Clearly describe who will conduct the sample analysis. *Note: This project is not intended to develop and optimize methodologies for testing for Legionella. The research team should provide justification to support the proposed methodologies.*
- Identify locational characteristics associated with a heightened likelihood of *Legionella* spp. occurrence.
- Define the roles and responsibilities of the research team and participating utilities.
- Provide a clear project timeline on how this project can help inform EPA and state primacy agency regulatory initiatives related to *Legionella*.
- Provide practical and actionable guidance for water utilities on how to further evaluate and respond to positive *Legionella* spp. samples.

Expected Deliverables

- A final report should be developed, defining what is known and what is unknown about the occurrence of *Legionella* spp. relative to the secondary disinfectant residual levels in distribution systems and providing a framework for how utilities can apply the findings.
- A WRF-sponsored webcast following project completion.
- Conference presentations or other appropriate outreach (e.g., peer-reviewed open access journals) should be prioritized to share interim results of interest.

Communication Plan
Please review WRF's *Project Deliverable Guidelines* for information on preparing a communication plan. The guidelines are available at https://www.waterrf.org/project-report-guidelines. Conference presentations, webcasts, peer-review publication submissions, and other forms of project information dissemination are typically encouraged.

Project Duration
Development of project deliverables early in the second quarter of 2024 is essential to ensure the opportunity for the water community to inform and communicate with EPA regarding M/DBP rule revisions. *The research team should keep in mind the schedules of EPA's potential M/DBP rule revisions.*

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

- Project 4983: Evaluating *Legionella* Detection Rates and Occurrence by Distribution System Characteristics in a Community Water System: https://www.waterrf.org/research/projects/evaluating-legionella-detection-rates-and-occurrence-distribution-system
- Project 4911: Sampling and Monitoring Strategies for Opportunistic Pathogens in Drinking Water Distribution Systems: https://www.waterrf.org/research/projects/sampling-and-monitoring-strategies-opportunistic-pathogens-drinking-water
- Project 4721: Detecting and Differentiating Opportunistic Premise Plumbing Pathogens to Determine Efficacy of Control and Treatment Technologies: https://www.waterrf.org/research/projects/detecting-and-differentiating-opportunistic-premise-plumbing-pathogens-determine
- Project 4664: Customer Messaging on Opportunistic Pathogens in Plumbing Systems: https://www.waterrf.org/research/projects/customer-messaging-opportunistic-pathogens-plumbing-systems
- Project 4092: Free-Living Protozoa and Opportunistic Pathogens in Distributed Water: https://www.waterrf.org/research/projects/free-living-protozoa-and-opportunistic-pathogens-distributed-water
- LeChevallier, M.W., 2019a. Monitoring distribution systems for *Legionella pneumophila* using Legiolert. AWWA Water Sci. 1, e1122: https://awwa.onlinelibrary.wiley.com/doi/full/10.1002/aws2.1122
- LeChevallier, M.W., 2019b. Occurrence of culturable *Legionella pneumophila* in drinking water distribution systems. AWWA Water Sci. 1, e1139: https://awwa.onlinelibrary.wiley.com/doi/full/10.1002/aws2.1139
- LeChevallier, M.W. 2021. Guidance on Developing a *Legionella pneumophila* Monitoring Program for Utility Distribution Systems. Health Education and Public Health. 4(1): 369 - doi:10.31488 /HEPH.158. https://healtheducationandpublichealth.com/guidance-on-developin-20a-legionella-pneumophila
- Omoregie E. 2019. *Legionella* Monitoring in NYC's Distribution System. National Environmental Monitoring Conference: https://nemc.us/docs/2019/presentations/pdf/Thursday-Government%20Public%20Health%20and%20Private%20Environmental%20Laboratory%20Partnerships-24.6-Omoregie.pdf

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 https://www.waterrf.org/policies. 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.

Proposal Preparation Instructions
This Emerging Opportunities Program RFP has unique proposal requirements. Please follow the submission instructions below. Proposals not adhering to the restrictions below will not be accepted.

The entire proposal, ***excluding*** the proposal cover worksheet, resumes, budget form, budget narrative, co-funding support form (when applicable), schedule, and references, should **not exceed ten pages in length**. Proposals must include the following components to be submitted in 1 PDF file:

- **Proposal Cover Worksheet:** https://www.waterrf.org/sites/default/files/file/2021-07/Proposal_Cover_Worksheet.pdf
- **Background and Statement of Need:** Provide a brief summary of the current state of knowledge for the issue that the proposed research will help address, and the drivers for the proposed research.
- **Objectives:** The proposed research objectives should be clearly identified in one or two sentences.
- **Technical Approach**: Describe how the proposed research will be conducted, and the tasks necessary to accomplish the objectives.
- **Benefit to WRF Subscribers:** Identify the practical benefits of the proposed research to water utilities and the water community.
- **Research Team and Other Participants:** Identify the key members of the research team and provide brief statements of their qualifications to conduct the proposed research. Identify any other organizations that have committed to collaborate on the proposed research. Curriculum vitae or resumes for research team members are required.
- **Budget:** A detailed budget is required. Identify the amount of WRF funds requested and any other cost-share, in-kind, or cash support for the proposed research. *Instructions for Budget Preparation* are available at https://www.waterrf.org/sites/default/files/file/2019-09/InstructionsforBudgetPreparation.pdf. The following items need to be included with the budget:
  - Proposal Budget Form: https://www.waterrf.org/sites/default/files/file/2021-07/15_BudgetForm.xlsx.
  - Budget Narrative (see *Instructions for Budget Preparation*)
  - Emerging Opportunities Co-funding Support Form (when applicable): Each co-funding organization providing cash to the project payable directly to WRF must complete a separate Emerging Opportunities Co-funding Support Form and include it with the proposal package. The form is available at https://www.waterrf.org/sites/default/files/file/2021-07/RPP_Co-Funding_Support_Form.pdf.
- **Schedule:** A detailed schedule is required.

- **References** (optional): detailed citations are not required in the proposal, but may be provided at the discretion of the researcher.

Proposals that include the production of web- or software-based tools, such as websites, Excel spreadsheets, Access databases, etc., must follow the criteria outlined for web tools presented in the Web Tool Criteria and Feasibility Study for The Water Research Foundation Project Deliverables at https://www.waterrf.org/sites/default/files/file/2021-07/WebToolCriteria.pdf.

Proposal Evaluation Criteria
The following criteria will be 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 Review and Funding Decision
WRF may fund one proposal through this solicitation or may choose to fund none of the proposals received, at its sole discretion.

WRF will form a Project Advisory Committee (PAC) composed of volunteer professionals with expertise in the research subject area to oversee the project(s) funded through this solicitation. Proposals will be reviewed by WRF staff and the PAC against established evaluation criteria. WRF may request additional information from the researcher based on this review. Proposals are treated confidentially and will not be shared outside of WRF.

The proposal review and selection process, from initial submittal through final decision, generally will not exceed 4 weeks.

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 https://www.waterrf.org/policies.

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 (1 PDF file), and they must be fully submitted before 3:00 pm Mountain Time on Thursday, February 10, 2022.

The online proposal system allows submission of your documents until the date and time stated in this RFP. Submit your proposal at https://forms.waterrf.org/220036267284857.

Please ensure you upload the required documents before the deadline. **Proposals submitted after the deadline will not be accepted**.

Questions to clarify the intent of this RFP and WRF's administrative, cost, and financial requirements may be addressed to the WRF project contact, Grace Jang, PhD, at (303) 347-6112 or hjang@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**.**

Utility and Organization Participants

The following utilities have indicated an 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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