



REQUEST FOR PROPOSALS (RFP)

Comprehensive Corrosion Control Strategies for Various Water Infrastructure Materials (5293)

Date Posted

Friday, September 20, 2024

Due Date

Proposals must be received by 3:00 pm Mountain Time on Thursday, November 21, 2024

WRF Project Contact

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Project Sponsors

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

Project Objectives

- Develop guidance for corrosion control strategies for various materials commonly found in water distribution systems (mains and service lines) and premise plumbing systems, including non-lead materials.
- Evaluate and compare different corrosion control processes, highlighting their advantages and disadvantages towards the variety of materials found in distribution and plumbing systems.
- Explore the feasibility of reducing, eliminating, or replacing orthophosphate-based corrosion control treatments in post lead service line (LSL) scenarios, assess subsequent impacts on remaining lead-containing and non-lead materials, and evaluate alternatives to orthophosphate for reducing lead and copper in drinking water.

Budget

Applicants may request up to \$350,000 in WRF funds for this project.

Background and Project Rationale

Water distribution mains, service lines, and premise plumbing systems are made of different materials, such as copper, galvanized steel, steel, cement-lined ductile iron, cast iron, plastic, lead, and brass. Each material possesses its own characteristics and requires specific strategies to prevent corrosion. However, current corrosion control requirements mainly focus on reducing lead corrosion, as outlined in the Lead and Copper Rule Revisions (LCRR) and the proposed Lead and Copper Rule Improvements (LCRI). This approach can be problematic for

water systems, whether they have many lead pipes or only a few. For those with few lead pipes, the current corrosion control regulatory framework may not be optimal for materials other than lead. For those with lead pipes, orthophosphate is often used to prevent corrosion.

As utilities work to remove LSLs, questions arise: Can we reduce or stop using phosphate-based treatments after LSLs are removed? How can water systems stop using corrosion control treatment (CCT) for lead once all LSLs are removed? This highlights the need for a more comprehensive approach to corrosion control that considers all materials in water infrastructure—from distribution mains to customer taps—to ensure safe and reliable drinking water delivery. This project will provide utilities with valuable insights to help them make informed decisions regarding corrosion control strategies.

Research Approach

We encourage proposers to bring creativity and originality to their proposals. Proposers should outline their research methods and demonstrate how they will achieve the objectives outlined above. The proposal must include the following tasks in the research approach with a detailed description of the research methodologies and a clear plan for addressing each task.

- Conduct a comprehensive review of existing literature and industry standards to identify corrosion control strategies tailored to specific materials commonly found in water distribution mains, service lines, and premise plumbing systems.
- Assess the effectiveness of various corrosion control treatments through literature review, surveys, and/or case studies from utilities that have implemented different corrosion control strategies and examine their impacts on different infrastructure materials. Highlight challenges and unintended consequences that may have been observed, if any.
- Investigate the feasibility of reducing or eliminating orthophosphate-based corrosion control treatments in post-LSL scenarios through experience from water systems.
- Explore alternatives to orthophosphate for reducing lead and copper in drinking water. These alternatives could be used instead of orthophosphate or during the transition away from orthophosphate in a post-LSL scenario. Also, consider addressing various challenges (e.g., small systems, disadvantaged communities that may lack the means to implement orthophosphate, systems with multiple water sources where corrosion control cannot be applied at each entry point) associated with orthophosphate use.
- Develop a guidance document outlining best practices for corrosion control for the most common materials found in distribution and plumbing systems.

Expected Deliverables

- A final report summarizing the findings of the comparative analysis of different corrosion control processes, the feasibility of reducing or eliminating orthophosphate-based corrosion control treatments in post-LSL scenarios, and the assessment of the effectiveness of various CCTs (must use WRF's [Research Report Template](#))
- Webinars to share project outcomes with water utility professionals and stakeholders on corrosion control strategies and best practices

- A decision support system or tool that utilities can use to select and implement the most appropriate corrosion control strategy based on their specific circumstances and goals. This tool could incorporate various factors, including material types, water chemistry, regulatory requirements, and cost considerations
- If technology deliverables (e.g., webtool) will be produced, they must follow the [Technology Deliverables Guidance](#).

Communication Plan

Please review WRF's [Project Deliverable Guidelines](#) for information on preparing a communication plan. Conference presentations, webcasts, peer-reviewed publication submissions, and other forms of project information dissemination are typically encouraged.

Project Duration

The anticipated period of performance for this project is 36 months from the 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 is it a required list for consideration. A copy of the WRF report(s) will be provided upon request.

- Arnold, R. B., R. Nigro, B. Sidhu, B. Rosenfeldt, D. Giammar, G. Gagnon, and B. Trueman. In-progress. *Using Phosphate-Based Corrosion Inhibitors and Sequestrants to Meet Multiple Water Treatment Objectives*. [Project 5119](#). Denver, CO: The Water Research Foundation.
- Brown, R., and D. Cornwell. In-progress. *Guidance for Complying with the Lead and Copper Rule Revisions for Water Systems with No- to Low Prevalence of Lead Service Lines (LSL, LSLs)*. [Project 5223](#). Denver, CO: The Water Research Foundation.
- Cantor, A. F. 2017. Optimization of Phosphorus-Based Corrosion Control Chemicals Using a Comprehensive Perspective of Water Quality. [Project 4586](#). Denver, CO: Water Research Foundation.
- Duranceau, S. J., D. Townley, and G. E. C. Bell. 2004. *Optimizing Corrosion Control in Water Distribution Systems*. [Project 2648](#). Denver, CO: AWWA Research Foundation; American Water Works Association.
- Jarvis, P., K. Quy, J. Macadam, M. Edwards, and M. Smith. 2018. *Intake of lead (Pb) from tap water of homes with leaded and low lead plumbing systems*. *Science of the Total Environment*, 644: 1346–1356.
- McTigue, N. E., D. A. Cornwell, and R. Slabaugh. 2022. *When and How to Evaluate Corrosion Control Treatment When Conditions Change*. [Project 5032](#). Denver, CO: The Water Research Foundation.
- United States Environmental Protection Agency (USEPA). 2016. *Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems*. USEPA, Office of Water. <https://www.epa.gov/sites/default/files/2016-03/documents/occtmarch2016.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 15 points)
- Communication Plan, Deliverables, and Applicability (maximum 20 points)
- Budget and Schedule (maximum 15 points)

PROPOSAL PREPARATION INSTRUCTIONS

Proposals submitted in response to this RFP must be prepared in accordance with WRF's [Guidelines for Research Priority Program Proposals](#) and [Instructions for Budget Preparation](#). These guidelines contain instructions for the technical aspects, financial statements, indirect costs, and administrative requirements that the applicant must follow when preparing a proposal.

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 [Technology Deliverables Guidance](#).

Eligibility to Submit Proposals

Proposals will be accepted from both U.S.-based and non-U.S.-based 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. 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](#).

Budget and Funding Information

The maximum funding available from WRF for this project is \$350,000. The applicant must contribute additional resources equivalent to at least 33% 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% to the project, but the maximum WRF funding

available remains fixed at \$350,000. Proposals that do not meet the minimum 33% of the project award will not be accepted. Consult the [Instructions for Budget Preparation](#) 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.

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 3:00 pm Mountain Time on Thursday, November 21, 2024.

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. Submit your proposal at <https://forms.waterrf.org/cbruck/rfp-5293>.

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 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 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 on your settings, you may need to click refresh on your browser to load the latest file.)**

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