



This project is being funded through the State Water Resources Control Board in California (SWB) Grant and the Advancing Potable Reuse Initiative that leverages the grant. This grant and initiative fund research to advance potable and non-potable reuse in California and across the world.

There are unique provisions associated with this funding – please review and follow the instructions in the entire RFP, particularly budget requirements (indirect costs cap) and prohibition of work in certain states. Proposals that do not follow instructions are subject to disqualification.

State Water Board (CA) and Advancing Potable Reuse Initiative Request for Qualifications (RFQ)

Evaluation of a Validation Protocol for Membrane Bioreactors Based on a Correlated Surrogate to Achieve Pathogen Credit for Potable Reuse (RFQ 4959)

Project Objectives

- Determine if a proposed correlated surrogate (“Tier 3”) validation protocol for pathogen removal from membrane bioreactors (MBRs) is feasible for potable reuse applications.
- Evaluate and adapt the proposed validation protocol for potential application in the United States.
- Develop recommendations on how to test and potentially verify the protocol.

Budget

Submissions may request WRF funds for \$25,000. WRF funds requested and total project value will be criteria considered in the selection process.

Background

A set of literature exists that has demonstrated the ability of MBR systems to provide significant virus, protozoa, and bacteria removal. A gap that exists is how some regulators are able to comfortably apply log removal value (LRV) credits for pathogens to MBR systems within potable reuse applications and the associated monitoring requirements.

For MBR systems to be more easily adopted for potable reuse applications in Australia, validation protocols were developed by the Australian Water Recycling Centre of Excellence and Australian WaterSecure Innovations as part of the WaterVal program (the relevant IP was recently assigned to Water Research Australia). The protocol describes three tiers of validation to obtain LRV credits for pathogens (viruses, *Cryptosporidium*, and *Giardia*). A brief overview of each tier is as follows:

- **Tier 1** – Adopting predefined, conservative LRVs based on the statistical analysis of historical MBR performance data and associated operating conditions.

- Tier 2 – Conducting challenge testing under the most conservative operating conditions expected for the specific system being validated to determine the minimum expected LRV, and implementing regular testing of target pathogens or surrogates.
- Tier 3 – Demonstrating the correlation between an online monitoring parameter, such as turbidity, or a set of parameters and MBR pathogen removal performance. The method is based on challenge testing the system to demonstrate the correlation between online parameter(s) and pathogen removal.

Tiers 1 and 2 of the validation protocol have been endorsed by regulators in Australia and the two validation strategies are currently being adapted for the United States through a separate Foundation project. While these two tiers provide a conservative validation method that can facilitate permitting in the short to medium term, it is preferred that validation include the continuous (direct or indirect) monitoring of treatment performance and system integrity. The proposed Tier 3 protocol provides a framework for this through correlating the value of a surrogate parameter(s) to the pathogen removal performance of the MBR.

Along with a more accurate assessment of pathogen removal, the Tier 3 validation may provide additional operational flexibility by allowing LRV credits to be demonstrated within an extended operating range and would help better define critical control limits. However, this Tier 3 validation has yet to be adopted by regulators in Australia as it is a new and experimental protocol that has not yet been fully tested at pilot or full-scale and peer-reviewed.

Project No. 4959 is part of WRF's Advancing Potable Reuse Initiative to establish potable reuse – both IPR and DPR – as a solution to the nation's water supply challenges. This initiative will sponsor research to address the regulatory, utility, and community concerns of the water industry and WRF's subscribers. This project seeks to further understand the ability of MBRs to remove pathogens from wastewater and the appropriate monitoring of the system.

Research Approach

Task 1 – Proposed Protocol Evaluation: Evaluate the proposed Tier 3 validation protocol for MBRs from WaterVal. This evaluation should include a gap analysis of the proposed protocol, strengths and limitations of the proposed protocol, plan and requirements for implementation by utilities, and potential log removal credits that may be awarded.

Task 2 – Application to the United States: Identify and discuss modifications that would need to be made to adapt the proposed WaterVal Tier 3 validation protocol in the United States. This should be based on the findings identified in Task 1 and work with any utility partners considering using MBRs in potable reuse. This task should focus on issues important to California, but can consider implications in other states including, but not limited to, Texas, Florida, Virginia, and Arizona.

Task 3 – Recommendations for Testing Protocols: Develop recommendations on how to implement a Tier 3 protocol for MBRs including operational parameters to be monitored in real time, testing methods, sampling protocols and frequency, and monitoring instrument calibration frequency and protocols. These recommendations should be balanced by a goal of implementation by utilities without undue financial and technical burden.

References and Resources

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

- WaterSecure 2017, Membrane Bioreactor, WaterVal validation protocol, Australian WaterSecure Innovations Ltd, Brisbane
(http://www.waterra.com.au/r7258/media/system/attrib/file/1709/201702_WaterVal_Validation-Protocol_Membrane-Bio-reactor.pdf)
- Branch, Amos and Le-Clech, Pierre (2015). National Validation Guidelines for Water Recycling: Membrane Bioreactors, Australian Water Recycling Centre of Excellence, Brisbane Australia
- Water Environment & Reuse Foundation Project Reuse-11-02: Equivalency of Advanced Treatment Trains for Potable Reuse
- WaterReuse Research Foundation Project WRRF-06-07: Investigation of Membrane Bioreactor Effluent Water Quality and Technology

Evaluation Criteria

Competitive candidates will have experience and qualifications in the following areas and have the option to form teams to meet the criteria described here:

1. Understanding of the problem
2. Proposed technical approach based on the Tasks outlined in this RFQ
3. Qualifications of key personnel in regard to evaluating the proposed Tier 3 validation protocol and its potential application in the United States

Submission Requirements for Statement of Qualifications

Please include the following items in your response:

1. Letter of Interest detailing how the respondent(s) meets the above criteria. This should be limited to five pages and include a budget and short budget narrative.
2. Resumes or CVs outlining the respondent's experience and experience of key team members.
3. Project cover sheet (included at the end of this document)

Budget and Funding Information

The funding available from WRF for this project is \$25,000. A maximum of 35% of the WRF funding amount can be applied to indirect costs (see funding provisions for definition). A minimum of 25 percent must be contributed by the applicant (i.e., the applicant's minimum contribution must equal one-third of WRF funds requested). 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 25 percent to the project but the maximum WRF funding available remains fixed at \$25,000. **Proposals that do not meet the minimum 25 percent of the total project value will not be accepted. See *Funding Provisions below***

Funding Provisions

The California State Water Resources Control Board (SWB) is funding all or a portion of this project through its Proposition 1 bond funds. The agreement No. D1705003 entitled "Research to Advance Potable and Non-potable Reuse in California" between SWB and WRF was fully executed on 3/30/18.

- Indirect Costs – SWB Grant Funds may not be used for any Indirect Costs (Gov. Code, § 16727.) WRF and the Advancing Potable Reuse Initiative is funding a maximum of 35% of the total budget that can be applied to indirect costs.

Definition per SWB grant: "Indirect Costs" means those costs that are incurred for a common or joint purpose benefiting more than one cost objective and are not readily assignable to the Research (i.e., costs that are not directly related to the Research). Examples of Indirect Costs include, but are not limited to: central service costs; general administration of the Recipient; non-research specific accounting and personnel services performed within the Recipient's organization; depreciation or use allowances on buildings and equipment; the costs of operating and maintaining non-research specific facilities; tuition and conference fees; generic overhead or markup; and taxes.

- Prohibition of travel or research in banned states – SWB Grant funds may not be used for any travel to or research in banned states that are identified by the Attorney General pursuant to Government Code section 11139.8, subd.(e), unless otherwise approved by the Grant Manager. The list of states identified by the Attorney General can be found here: <https://oag.ca.gov/ab1887>.
 - The Recipient shall not perform research in, travel to, or hold any meetings in states that are identified
 - The Recipient shall ensure that the SWB, the Governor of the State, or any authorized representative of the foregoing, will have safe and suitable access to the Research site at all reasonable times during Research work.
 - There cannot be any work on any level of the project in connection with the research – including in-kind contributions from researchers, universities, utilities, etc. in banned states.
- Travel – Prior Approval and Reimbursement
 - Prior Approval – Travel to be reimbursed by grant funds requires prior written authorization. Please allow at least 2 weeks' notice for WRF to gain approval from SWB.
 - Reimbursement – Reimbursement shall be at rates not to exceed those set by the California Department of Human Resources. These rates may be found at <http://www.calhr.ca.gov/employees/pages/travel-reimbursements.aspx>.

Reimbursement will be at the State travel and per diem amounts that are current as of the date costs are incurred by the Recipient.

- Subcontracting – The Recipient shall not contract or allow subcontracting with excluded parties. The Recipient shall not contract with any party who is debarred or suspended or otherwise excluded from or ineligible for participation in any work overseen, directed, funded, or administered by the SWB program for which this funding is authorized. For any work related to this Agreement, the Recipient shall not contract with any individual or organization on the

SWB's List of Disqualified Businesses and Persons that is identified as debarred or suspended or otherwise excluded from or ineligible for participation in any work overseen, directed, funded, or administered by the SWB program for which funding under this Agreement is authorized. The SWB's List of Disqualified Businesses and Persons is located at https://www.waterboards.ca.gov/water_issues/programs/enforcement/fwa/dbp.html.

The State Water Board grant agreement states that final deliverables are due by January 31, 2021. For WRF to comply with this requirement, all deliverables are due to WRF by October 31, 2020.

Application Procedure and Deadline

Response Due Date: Submittals must be received by **Tuesday, January 22, 2019, 2:00 PM Mountain Time**. Please include **"4959 Request for Qualifications"** in the subject line of the email.

Please send RFQ Responses to: Caroline Bruck
Email: cbruck@waterrf.org

Questions to clarify the intent of this Request for Qualifications and WRF's administrative, cost and financial requirements may be addressed to the Research Manager, Justin Mattingly, at (571) 699-0024 or by email at jmattingly@waterrf.org.

State Water Board Projects: Frequently Asked Questions

FAQs

Q: Are any indirect costs covered for these projects?

A: Yes, partially. SWB Grant Funds may not be used for any Indirect Costs – so these costs must be clearly identified so we ensure to adhere to that agreement. WRF and the Advancing Potable Reuse Initiative is funding a maximum of 35% of the WRF funding amount for indirect cost recovery.

Q: I am located in a banned state; can I participate on a research team?

A: No -- The SWB is funding this research, and the projects cannot be connected to work in banned states. This is even the case if services are donated.

Q: Can a project meeting or workshop be held in a banned state?

A: No, this is not allowed since SWB employees are not permitted to travel to banned states.

Q: I am located in a banned state; can my utility provide in kind service towards the project?

A: No, the SWB cannot be connected with research performed/data collected in banned states.

Q: Is prior approval for all travel, even for regular work at a utility, necessary? What is the process to gain approval?

A: Yes, prior approval is needed, as the SWB must ultimately provide this authorization. Please request a travel authorization form from your Research Manager. If there is frequency to your travel/site visits, you can indicate so in the form to request multiple trips. Plan to submit to your research manager quarterly to avoid last minute approval requests.

Q: I see that we must submit final report/deliverable by October 31, 2020. We expect it will be a 24-month project, so this is a tight timeline. Will there be an option for a no cost extension?

A: This deadline is based on the SWB grant agreement that requires final deliverables to be submitted by January 31, 2021 (three months is needed for the WRF publication process and project closeout). This is based on expiration of Proposition 1 bond funds. This deadline is expected to be extended by the CA Governor in July 2019, however at this time we are under contract must plan for this deadline.

State Water Board Projects: Frequently Asked Questions on Budget Development

Summary

As stated in the RFP, there is a maximum allowable by project for indirect costs. It varies from 35% - 50% by project, so please carefully note this in developing your budget.

| Project # | SWB Phase 2: FY18 and beyond | Budget | Research Manager | Indirect Cost Cap | RFP Release/Deadline |
|-----------|---|-----------|------------------|-------------------|----------------------|
| 4953 | Blending Strategies with Alternative Supplies | \$400,000 | Stephanie F | \$200,000 | Oct 30 / Dec 19 |
| 4954 | High Frequency Performance Data for DPR | \$400,000 | Grace | \$200,000 | Oct 30 / Dec 19 |
| 4955 | Indicator Viruses for Advanced Treatment | \$300,000 | Grace | \$125,000 | Oct 30 / Dec 19 |
| 4957 | Pathogen Reduction through Aquifer Recharge | \$100,000 | Stefani M | \$35,000 | Dec 11 / Jan 22 |
| 4958 | Protocols for Log Removal Credits for NF and RO | \$350,000 | Justin | \$122,500 | Oct 30 / Dec 12 |
| 4959 | Tier 3 Validation for Membrane Bioreactors | \$25,000 | Justin | \$8,750 | Dec 11 / Jan 22 |
| 4960 | Industrial Contaminants Review | \$200,000 | Ashwin | \$70,000 | Oct 30 / Dec 12 |
| 4961 | NGS and Metagenomics Research | \$300,000 | Stefani M | \$105,000 | Oct 30 / Dec 19 |
| 4962 | Wastewater Feasibility Study | \$105,000 | Stephanie F | \$36,750 | Dec 11 / Jan 22 |
| 4963 | Developing a New Foundational Understanding of SAR | \$200,000 | Kristan | \$70,000 | Oct 30 / Dec 12 |
| 4964 | Assessing the State of Knowledge and Impacts of Recycled Water Irrigation on Agricultural Crops | \$120,000 | Kristan | \$42,000 | Dec 11 / Jan 22 |

In order to comply with State Water Board grant terms, each proposer **and its subrecipients and subcontractors** must complete a WRF Proposal Budget Form and provide its own indirect cost rate documentation.

State Water Board Projects: Frequently Asked Questions on Budget Development

FAQs

Q: Is the indirect cost cap (as indicated above/in RFP) applicable to each participating party (prime + subs must adhere to, for example, 35% max), or is it collectively for the total budget (e.g. some can come in over/under as long as it's equal or less than 35% of total WRF budget)?

A: The latter is correct – as long as the indirect costs are equal to or less than the amount/percentage indicated in the RFP of the total WRF budget (see RFP or above chart for actual amount of cap).

Q: What if we bring cash support to the project?

A: You can bring cash to the project, however even with this added amount, the Indirect costs must be equal to or less than the % of the WRF budget indicated in the RFP (see above chart for cap). Please indicate this amount in the 'Cost Share' column of the budget spreadsheet. It can be collected and tracked by the prime recipient.

Q: What level of detail does WRF require for subrecipients? Is TOTAL BUDGET = Total eligible costs (direct, etc.) + Indirect costs sufficient?

A: No, due to the requirements of the SWB grant, we request that even sub-recipients complete the WRF budget form and provide indirect cost documentation in accordance with Section 17 of the Guidelines for Focus Area Program Proposals. This way we can ensure indirect costs are clearly delineated.

Q: Our annual FAR audited rate provides a single number that combines indirect costs + fringe benefits. Can our accounting staff use the audited schedule to break out the fringe and indirect rates?

A: Yes, please provide the fringe and indirect rates in a letter (signed by your CFO or Accounting Manager) to WRF accompanying the budget and the indirect cost documentation in accordance with Section 17 of the Guidelines. Fringe can be covered by grant funds. Indirect costs must not exceed the number indicated in the RFP/above.

Q: Can we include a fee?

A: Yes, you may, place in tab "I. Fee"

Program Proposal Cover Worksheet

Project Title: _____

Organization: *(Legal name as it should appear in the contract)*

Principal Investigator: _____

Organization: _____

Address: _____

Phone: _____ E-mail: _____

Personnel:

Principal Investigator: _____

Organization: _____

Address: _____

Phone: _____ E-mail: _____

Anticipated Co-Principal Investigator: _____

Organization: _____

Address: _____

Phone: _____ E-mail: _____

Anticipated other personnel: _____

Organization: _____

Address: _____

Phone: _____ E-mail: _____

Authorized Representative: *Original Awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: _____

Title: _____

Organization: _____

Address: _____

Phone: _____ E-mail: _____

Accounting Contact: *Individual authorized to accept payments.*

Name: _____

Title: _____

Organization: _____

Address: _____

Phone: _____ E-mail: _____

All Other Anticipated Participating Organizations (not listed above):

| Organization | City/State/Country |
|--------------|--------------------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Project Period: _____

Foundation Funds Requested: \$ _____

Anticipated In-Kind or other Contributions: \$ _____

TOTAL PROJECT BUDGET: \$ _____ (Total of Foundation Funds
and In-kind)