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REQUEST FOR PROPOSALS (RFP)

Geochemical Considerations for Managed Aquifer Recharge (MAR) Implementation in Potable Reuse (RFP 5051)

Due Date: Proposals must be received by 2:00 pm Mountain Time on Tuesday, November 5, 2019
WRF Project Contact: Harry Zhang, PhD, PE, hzhang@waterrf.org

Project Sponsors

This project is co-funded by The Water Research Foundation (WRF), the California State Water Resources Control Board (SWB), and contributors to the *Advancing Potable Reuse Initiative* as part of the SWB Grant D1705003.

Project Objectives

- Estimate the influence of geochemical conditions on the fate of regulated and unregulated contaminants during MAR.
- Identify advanced water treatment (AWT) effluent water quality parameters of interest (e.g., ORP, TDS, pH, and alkalinity) for aquifer compatibility, including the impact of disinfection on geochemistry.
- Develop direction for stabilizing AWT effluent to mitigate mobilization of aquifer geochemistry (e.g., arsenic, chromium) prior to recharge.
- Provide guidance to utilities considering MAR that includes potential application point impacts (e.g., shallow vs. deep well), water quality compatibility considerations, and monitoring techniques for risk mitigation.

Budget

Applicants may request up to \$112,000 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

Managed Aquifer Recharge (MAR) is the intentional recharge of water into a subsurface aquifer for future recovery or other environmental benefits. MAR effort may include treating wastewater effluent to National and State water quality standards using AWT techniques for recharge of aquifer systems. MAR is an indirect potable reuse (IPR) strategy that has the potential to reduce saltwater intrusion, counteract land subsidence, replenish diminishing groundwater supplies, improve groundwater quality (depending on current water quality), and reduce nutrient discharges. MAR can assist utilities with long-term water supply planning and could play an important role in future California reuse goals.

While there have been several studies to characterize the impacts of potable water on aquifer storage and recovery (ASR) systems, few evaluations have focused on injection of AWT effluent. A systematic approach for evaluating water quality and site-specific subsurface geochemical conditions to understand the long-term impact to groundwater quality is lacking. This study will build upon the findings of WRF Project Reuse-16-01, *Evaluating Post Treatment Challenges for Potable Reuse Applications*.

This study will provide guidance for utilities and municipalities who are considering MAR and examining if they can implement MAR in its preliminary stages. For example, how to evaluate aquifer compatibility and the unique aspects of potable reuse relating to MAR. Furthermore, this study develops guidance for optimizing AWT effluent to mitigate mobilization of existing subsurface contaminants prior to recharge. Case studies synthesized through this effort could provide useful information (including justification) for past precedents and lessons learned by other utilities and municipalities for implementing MAR that accounts for specific local subsurface conditions.

Research Approach

- Provide a literature review that includes analysis of drinking water and recycled water ASR geochemical evaluations, range of AWT effluent water quality conditions, important geochemical water quality monitoring parameters, and other factors that characterize the materials in the aquifer itself.
- Provide a review of current potable reuse MAR case studies that describes geochemical compatibility approaches across geographic regions.
- Propose water quality conditioning options to stabilize AWT effluent with aquifer geochemistry (e.g., chemical addition, quenching agents). This effort would focus on (but is not limited to) preventing the leaching of existing contaminants within an aquifer such as radionuclides and metals (e.g., arsenic, chromium).
- Develop a decision support framework for a MAR geochemical assessment to guide project planning and implementation.
- Identify research needs and areas of remaining uncertainty. Within the budget of this project and/or with in-kind contributions, address experimentally or through modeling or other investigative approaches, those research needs that are critical to the success of MAR implementation in potable reuse.
- Discuss the research findings with Project Advisory Committee (PAC) and participating utilities through a web-based workshop/webcast. The research team will prepare the workshop agenda, facilitate the workshop discussion, and prepare a synthesis document containing a summary of the workshop and discussion outcomes including future research needs.
- Conduct a webcast (hosted by WRF and collaborating organization) on the overall findings of this project for broader community outreach.

Expected Deliverables

- A stand-alone summary report from the literature review (e.g., a comprehensive list of annotated bibliographies), including all supporting documents obtained from that effort (e.g., copy of peer-reviewed articles and technical reports).
- Workshop agenda, supporting materials, and synthesis document for a web-based workshop.
- Annotated outline of draft report with sufficient technical details for MAR Geochemical Assessment.
- An interactive draft report on MAR Geochemical Assessment that includes:
 - A decision support framework for a MAR geochemical assessment to guide project planning and implementation.

- The use of effective visual tools and user-friendly graphics for MAR implementation.
- Detailed technical appendices on case studies.
- A summary of identified research needs that are critical to the success of MAR implementation in potable reuse.
- Final Report on MAR Geochemical Assessment after addressing review comments.
- Outreach materials such as webcast, abstracts/presentations at national conferences (without support from project funding), and one peer-reviewed journal article.

Communications Plan

Please review WRF's *Project Deliverable Guidelines* for information on preparing a communications 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

The anticipated period of performance for this project is 18 to 24 months from the contract start date. See SWB deadline information below.

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.

The Water Research Foundation (WRF) (2016). *Project Reuse-16-01 Evaluating Post Treatment Challenges for Potable Reuse Applications*.

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 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. Additionally, there are unique requirements for this SWB funded project, as detailed below.

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. However, for this specific project, because a portion of the funding is from California, there are territory

limitations that can be reviewed at <https://oag.ca.gov/ab1887> that prohibit individuals and/or organizations from certain states from participating in this project. **See funding provisions below.**

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>.

For this specific project, however, indirect costs are limited to and may not exceed \$28,948.67, as no funding from the State of California can be used for indirect costs by any recipient (prime or sub) at any contracting level.

Budget and Funding Information

The maximum funding available from WRF for this project is \$112,000. 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 \$112,000. **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.

Funding Provisions

The SWB is funding approximately 75% of this project through their 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 March 30, 2018.

- Indirect Costs – SWB grant funds may not be used for any Indirect Costs (Gov. Code, § 16727), however WRF will cover **up to approximately 25%** of the project budget (not including in-kind) for indirect costs. Still, we must see the indirect cost breakout to substantiate to the State of CA that their funds are not used for indirect costs of any recipient on the team (whether prime or sub). ***See FAQs below for further requirements on providing budgets and indirect costs.***

Definition per the 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.

- Travel – Prohibition, Prior Approval, Reimbursement
 - Prohibition – 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.
 - Prior Approval – Travel to be reimbursed by grant funds requires prior written authorization. Please allow at least two (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.
- Deadline – The current SWB 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. The appropriations end date for Grant funds has been extended to June 30, 2024, however a formal modification to the agreement will require several months to execute. Please consider these timing challenges in the proposal – while the project duration should be honored in the fulfilling the scope, a premature end date may be needed until the extension modification is granted.

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, November 5, 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, Harry Zhang at (571) 384-2098 or h Zhang@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 upon your settings, you may need to click refresh on your browser to load the latest file.)**

N/A

FAQs on SWB Funded Projects

Q: Are any indirect costs covered for these projects?

A: Yes, but only up to approximately 25% of the budget (not including in-kind contribution from the applicant). This includes the prime recipient, as well as subcontractors and consultants. The State of CA does not cover any indirect costs – those are funded by WRF and need to be clearly budgeted and submitted with the required supporting indirect cost documentation as per the *Guidelines for the Research Priority Program Proposals*, Section 17. Please see the Indirect Costs column in the table below for the exact values of allowed indirect costs for each project:

Project #	Research Title	Total Costs	Direct Costs	Indirect Costs
5047	Guidelines for the Demonstration of Pathogen Log Removal Credits in Wastewater Treatment	\$80,000.00	\$59,322.38	\$20,677.62
5048	Integrating Real-Time Collection System Monitoring Approaches into Enhanced Source Control Programs for Potable Reuse	\$200,000.00	\$148,305.94	\$51,694.06
5049	Public Health Benefits and Challenges for Blending of Advanced Treated Water with Raw Water Upstream of a Surface Water Treatment Plant in DPR	\$100,000.00	\$74,152.97	\$25,847.03
5050	Applicability of the UV/Chlorine AOP: Assessment of Applicability, Operational issues, and Potential By-Products	\$150,000.00	\$111,229.45	\$38,770.55
5051	Geochemical Considerations for Managed Aquifer Recharge (MAR) Implementation in Potable Reuse	\$112,000.00	\$83,051.33	\$28,948.67
5052	Standardizing Methods with QA/QC Standards for Investigating the Occurrence and Removal of ARB/ARGs in Wastewater and Advanced Treated Water	\$200,000.00	\$148,305.94	\$51,694.06

Q: Is there a special budget form for the SWB projects? How do I show required indirect costs?

A: No, there is not a special budget form for the SWB projects. However, under this RFP all of the proposer’s (prime’s) participants (subcontractors [subs], consultants, and contractors) must each complete the standard WRF [Budget Form](#), and all subs, consultant, and contractor Budget Forms need to be submitted to the proposer to be included along with the proposer’s online submission to WRF.

Indirect costs (base, rate and resulting expense) are shown on each entity’s (proposer and all participants) individual Budget Form (above).

Additionally, each entity must provide indirect cost rate documentation in accordance with Section 17 of the *Guidelines for Research Priority Program Proposals*. As with the Budget Form, each entity must submit their indirect cost rate documentation to their proposer to be included in the online submission to WRF.

If any entity cannot provide the required indirect cost rate documentation (as described in Section 17), then the proposer must count that entity's entire budget towards the indirect cost recovery cap. WRF is able to separately budget for the payment of indirect costs that are equal to or less than the amount/percentage of the total WRF budget for the cap as indicated in this RFP. **Proposals that do not meet this requirement in accordance with the indirect cost rate cap will not be accepted.**

Finally, if for genuine and necessary protection of confidential business information, subs are restricted from submitting their indirect cost rate documentation (see Section 17 of the *Guidelines*) through their proposer, they may send that one document only (NOT the Budget Form, which has to be submitted only to the proposing entity, and NOT financial statements (Balance Sheet and Income Statement) or any other forms in the proposal (none of which are required by WRF from any of the proposer's subs) to Steve Sidars at ssidars@waterrf.org.

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

A: No, due to the SWB funding of this research, projects cannot in any way be connected to work in banned states (team members or participating agencies from banned states are not permitted). 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 services 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 these requests to your Research Manager quarterly to avoid last-minute requests for approval.