



PROPOSITION 1 WATER RECYCLING RESEARCH

REGENTS OF THE UNIVERSITY OF CALIFORNIA, OFFICE OF THE PRESIDENT

AND

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD



RESEARCH GRANT

NATIONAL ALLIANCE FOR WATER INNOVATION WATER RECYCLING RESEARCH

AGREEMENT NO. D2105001

AMENDMENT 1

RESEARCH FUNDING AMOUNT: ~~\$975,632~~ **\$2,500,000**

ELIGIBLE START DATE: MAY 1, 2022

RESEARCH COMPLETION DATE: ~~MARCH 31, 2024~~ **NOVEMBER 30, 2025**

FINAL REIMBURSEMENT REQUEST DATE: ~~APRIL 30, 2024~~ **DECEMBER 31, 2025**

RECORDS RETENTION END DATE: ~~MARCH 31, 2060~~ **NOVEMBER 30, 2061**

This Grant Agreement executed by the State Water Board on October 26, 2022, is hereby amended as of May 15, 2023, to increase the Research Funding Amount, revise the Research Completion Date, Final Reimbursement Request Date, Records Retention End Date, the body of the agreement, and Exhibits A and B (deletions shown as stricken and revisions bold and underlined). Except as noted herein all other terms and conditions shall remain the same.

WHEREAS,

1. The State Water Board is authorized to provide funding under this Agreement pursuant to sections 79765 et seq. of the Water Code (Prop 1).
2. The State Water Board determines eligibility for financial assistance, determines a reasonable schedule for providing financial assistance, establishes compliance with Prop 1, and establishes the terms and conditions of the funding agreement.
3. The State Water Board adopted Resolution Nos. 2018-0035 and 2019-0026, which authorize the Executive Director and their designee to award a Prop 1 grant to the Recipient to serve as match funding for the Recipient's (Energy-Water Desalination Hub) Project.
4. The State Water Board proposes to provide financial assistance for eligible costs of the Research, and the Recipient desires to participate as a recipient of financial assistance from the State Water Board, upon the terms and conditions set forth in this Agreement, all pursuant to Prop 1.
5. This grant is for the benefit of the Recipient to advance water recycling research and development, and is not for the planning or construction of a water recycling project as defined in section 79135 of the Water Code.

NOW, THEREFORE, in consideration of the premises and of the mutual representations, covenants and agreements herein set forth, the State Water Board and the Recipient, each binding itself, its successors and assigns, do mutually promise, covenant, and agree as follows:

1. DEFINITIONS

Unless otherwise specified, each capitalized term used in this Agreement has the following meaning:

"Agreement" means this research grant, including all exhibits and attachments hereto.

"Authorized Representative" means the duly appointed representative of the Recipient as set forth in the certified original of the Recipient's authorizing resolution that designates the Authorized Representative by title.

"Cover Page" means the front page of this Agreement.

"Days" means calendar days unless otherwise expressly indicated.

"Deputy Director" means the Deputy Director of the Division.

"Division" means the Division of Financial Assistance of the State Water Board or any other segment of the State Water Board authorized to administer this Agreement.

"Eligible Start Date" means the date set forth on the Cover Page of this Agreement, establishing the date on or after which reimbursable costs may be incurred and eligible for reimbursement hereunder.

"Event of Default" means the occurrence of any of the following events: (a) any representation or warranty made by the Recipient under this Agreement proves to be incorrect in any material respect, (b) the Recipient's failure to observe or perform any covenant, condition, or provision contained in Exhibit B of this Agreement, (c) the failure of the Recipient to perform any covenant or condition under this Agreement and such failure shall remain unremedied for a period of 30 days, unless expressly waived by the Division, (d) the failure of the Recipient to keep in full force and effect its legal existence and any rights, licenses, permit, or privileges to conduct its business, or the occurrence of any material restraint on Recipient's business by a government agency or by court order (e) initiations of proceedings seeking liquidation, reorganization, or other relief with respect to the Recipient or its debts, or for the appointment of a receiver, trustee, custodian or conservator with respect to the Recipient or any part of its assets, or similar event, (f) a material adverse change in the business, operations, or condition (financial or otherwise) of Recipient.

"Fiscal Year" means the period of twelve (12) months terminating on June 30 of any year.

"Final Reimbursement Request Date" means the date set forth on the Cover Page of this Agreement, after which date, no further Research Funds reimbursements or disbursements may be requested.

"Force Account" means the use of the Recipient's own employees or equipment.

"Generally Accepted Accounting Principles (GAAP)" means the uniform accounting and reporting procedures set forth in publications of the American Institute of Certified Public Accountants or its successor, or by any other generally accepted authority on such procedures, and includes, as applicable, the standards set forth by the Governmental Accounting Standards Board or its successor.

"Guidelines means the Water Recycling Funding Program Guidelines, as amended by the State Water Board on October 16, 2019.

"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-project 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-project specific facilities; tuition and conference fees; generic overhead or markup; and taxes.

"Material Event" means the failure of the Recipient to observe or perform any covenant in this Agreement, including any of the following: (a) revenue shortfalls; (b) adverse findings by the State Water Board; (c) any false warranty or representation made by the Recipient relevant to this Agreement; (d) any event set forth in this Agreement.

"Party Contact" means, for the Recipient, the Authorized Representative of the Recipient or any designee of the Authorized Representative, and, for the State Water Board, the Division staff set forth in Section 2 of this Agreement.

“Project Advisory Committee” means a group of scientists, engineers, and other relevant backgrounds selected and administered by the Water Research Foundation to provide expert scientific review of select Research components. The Project Advisory Committee reviews Research submittals and provides technical oversight and objective feedback to the Recipient.

“Project Director” means an employee of the Recipient designated by the Authorized Representative to be responsible for the overall management of the administrative and technical aspects of the executed Agreement.

“Project Manager” means the person designated by the State Water Board to manage performance of this Agreement.

“Recipient” means the Regents of the University of California, Office of the President.

“Records Retention End Date” means the last date that the Recipient is obligated to maintain records related to this Agreement and is set forth on the Cover Page of this Agreement.

“Reimbursement Period” means the period during which Research Funds may be disbursed.

“Reimbursement Request” means the Recipient’s request of Research Funds from the State Water Board as set forth in Exhibit B.

“Research” means the Research financed by this Agreement as described in Exhibit A, and in the documents incorporated by reference herein.

“Research Completion” means the Recipient’s submittal of all work set forth under Exhibit A for review by the Division and, as determined by the Division, that the Research is complete to the reasonable satisfaction of the Division. The Division may require corrective work to be performed on deliverables required to be submitted under this Agreement. Any work occurring after the Research Completion Date will not be reimbursed under this Agreement.

“Research Completion Date” means the date set forth on the Cover Page of this Agreement and is the last date on which Research Costs may be incurred under this Agreement.

“Research Costs” means the incurred costs of the Recipient which are eligible for funding under this Agreement, pursuant to applicable statutes, policy, regulations, or guidelines.

“Research Funds” means all moneys disbursed to the Recipient by the State Water Board for eligible Research Costs pursuant to this Agreement.

“Research Funding Amount” means the maximum amount payable under this Agreement, as set forth on the Cover Page.

“State” means State of California.

“State Water Board” means the California State Water Resources Control Board.

“Technical Liaison” means the State Water Board staff who will work with the Project Manager to review research submittals.

“Year” means calendar year unless otherwise expressly indicated.

2. Party Contacts

The Party Contacts during the term of this Agreement are:

State Water Board		Regents of the University of California	
Section:	Division of Financial Assistance		
Name:	Elnaz Nasaei, Project Manager	Name:	Rachel Wallace, Director, Grant Operations <u>Kathleen Erwin, Executive Director, Research Grants Program Office</u>
Address:	1001 I Street, 16 th Floor	Address:	1111 Franklin Street
City, State, Zip:	Sacramento, CA 95814	City, State, Zip:	Oakland, CA 94607
Phone:	(916) 319-9283	Phone:	(510) 987-9344 <u>(510) 987-9889</u>
Email:	Elnaz.Nasaei@waterboards.ca.gov	Email:	Rachel.Wallace@ucop.edu <u>Kathleen.Erwin@ucop.edu</u>

State Water Board	
Section:	Division of Water Quality
Name:	Cindy Figueroa, Technical Liaison
Address:	1001 I Street, 15th Floor
City, State, Zip:	Sacramento, CA 95814
Phone:	(916) 327-8675
Email:	Cindy.Figueroa@waterboards.ca.gov

The Recipient may change its Project Director upon written notice to the Project Manager, which notice shall be accompanied by authorization from the Recipient’s Authorized Representative. The State Water Board will notify the Project Director of any changes to its Party Contacts.

3. Exhibits and Appendices Incorporated

The following exhibits and appendices to this Agreement, including any amendments and supplements hereto, are hereby incorporated herein and made a part of this Agreement:

EXHIBIT A - SCOPE OF WORK

EXHIBIT B - FUNDING TERMS

EXHIBIT C - GENERAL TERMS AND CONDITIONS

4. Representations and Commitments

The Recipient represents commits to the following as of the Eligible Start Date set forth on the Cover Page and continuing thereafter for the term of this Agreement.

- (a) General Recipient Commitments. The Recipient shall comply with all terms, provisions, conditions, and commitments of this Agreement, including all incorporated

documents, and to fulfill all assurances, declarations, representations, and commitments made by the Recipient in the application, accompanying documents, and communications filed in support of its request for financial assistance.

- (b) **Authorization and Validity.** The execution and delivery of this Agreement, including all incorporated documents, has been duly authorized by the Recipient. This Agreement constitutes a valid and binding obligation of the Recipient, enforceable in accordance with its terms, except as such enforcement may be limited by law.
- (c) **No Violations.** The execution, delivery, and performance by the Recipient of this Agreement, including all incorporated documents, do not violate any provision of any law or regulation in effect as of the date of execution of this Agreement by the Recipient, or result in any breach or default under any contract, obligation, indenture, or other instrument to which the Recipient is a party or by which the Recipient is bound as of the date of execution of this Agreement by the Recipient.
- (d) **No Litigation.** There are no pending or, to the Recipient's knowledge, threatened actions, claims, investigations, suits, or proceedings before any governmental authority, court, or administrative agency which materially affect the financial condition or operations of the Recipient.
- (e) **Solvency.** None of the transactions contemplated by this Agreement will be or have been made with an actual intent to hinder, delay, or defraud any present or future creditors of the Recipient. As of the Eligible Start Date set forth on the Cover Page of this Agreement, the Recipient is solvent and will not be rendered insolvent by the transactions contemplated by this Agreement. The Recipient is able to pay its debts as they become due.
- (f) **Legal Status and Eligibility.** The Recipient is duly organized and existing and in good standing under the laws of the State of California, and will remain so during the term of this Agreement. To the extent legally permitted under the California Constitution, the Recipient shall at all times maintain its current legal existence and preserve and keep in full force and effect its legal rights and authority. The Recipient independently represents its eligibility and covenants to maintain its eligibility for funding under this Agreement through Research Completion.
- (g) **Good Standing.** The Recipient is currently in compliance with the terms and conditions set forth in Exhibit C, including any state requirements set forth therein. Within the preceding ten years, the Recipient has not failed to demonstrate compliance with previous state audit disallowances, as it pertains to grants administered through the Recipient's Office of the President.
- (h) **Insurance.** The Recipient maintains sufficient insurance coverage considering the scope of this Agreement, including, for example, but not necessarily limited to, General Liability, Automobile Liability, Worker's Compensation and Employer's Liability, and Professional Liability insurance.
- (i) The Recipient is in compliance with all State Water Board funding agreements to which it is a party.

5. Research Completion

The Recipient shall expeditiously proceed with and complete the work under this Agreement.

6. Notice

- (a) The Recipient shall notify the Division within ten (10) working days of the occurrence of any of the following:
 - (1) Bankruptcy, insolvency, receivership or similar event of the Recipient;
 - (2) Actions taken pursuant to state law in anticipation of filing for bankruptcy;
 - (3) Material Events; or
 - (4) Any litigation pending or threatened against the Recipient regarding its continued existence, consideration of dissolution, or disincorporation.
- (b) The Recipient shall notify the Division promptly of the following:
 - (1) Any proposed change in the scope of the Research. Under no circumstances may the Recipient make changes to the scope of the Research without receiving prior review and approval by the Division. Changes to the scope will require an amendment to this Agreement;
 - (2) Cessation of all major work on the Research where such cessation of work is expected to or does extend for a period of thirty (30) days or more;
 - (3) Any circumstance, combination of circumstances, or condition, which is expected to or does delay Research Completion;
 - (4) Any Research demonstration activities such that the State Water Board staff may observe and document such activities;
 - (5) Any public or media event publicizing the accomplishments and/or results of this Agreement and provide the opportunity for attendance and participation by state representatives with at least ten (10) working days' notice to the Division; or
 - (6) Research Completion.

7. Signature

This Agreement, and any amendments hereto, may be executed and delivered in any number of counterparts, each of which when delivered shall be deemed to be an original, but such counterparts shall together constitute one document. The parties may sign this Agreement, and any amendments hereto, either by an electronic signature using a method approved by the State Water Board or by a physical, handwritten signature. The parties mutually agree that an electronic signature using a method approved by the State Water Board is the same as a physical, handwritten signature for the purposes of validity, enforceability, and admissibility.

IN WITNESS WHEREOF, this Agreement **Amendment** has been executed by the parties hereto.

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, OFFICE OF THE PRESIDENT:

STATE WATER RESOURCES CONTROL BOARD:

By: *Melissa Waver*
Melissa Waver (May 25, 2023 17:56 PDT)

By: *J. Karkoski*

Name: Melissa Waver
Title: Contract and Grant Operations Officer

Name: Joe Karkoski
Title: Deputy Director
Division of Financial Assistance

Date: May 25, 2023

Date: May 30, 2023

EXHIBIT A – SCOPE OF WORK

A-1. Completion Date

The Research Completion Date is established as the date set forth on the Cover Page of this Agreement. Work occurring after the Research Completion Date, including corrective actions, is not eligible for reimbursement with Research Funds.

A-2. Purpose

This grant is for the benefit of the Recipient. This grant is for the National Alliance for Water Innovation (NAWI) which has an existing contract with the United States Department of Energy (U.S. DOE) to act as its Energy-Water Desalination Hub and is for the purpose of conducting research to lower the cost and energy of desalination for reuse applications. Research focuses on improving efficiency by identifying new processes to reduce energy use, improve brine management, increase the longevity of system components, or develop methodologies to optimize operational efficiency.

The Regents of the University of California, Office of the President (UCOP) is the Recipient for the funds and will act as NAWI's contracting authority. Specifically, the Research Grants Program Office (RGPO) within UCOP, working directly with NAWI, will manage the agreement for NAWI.

A-3. Research-Specific Scope of Work

The Recipient agrees to do the following:

1. Research Administration

- 1.1 Provide all technical and administrative services needed for Research Completion; monitor, supervise, and review all work performed; and coordinate budgeting and scheduling to ensure the Research is completed within budget, on schedule, and in accordance with approved procedures, applicable laws, and regulations.
- 1.2 Notify the Project Manager at least fifteen (15) working days in advance of upcoming meetings, workshops, webinars, and trainings.
- 1.3 Conduct Research status review meetings as requested by the Project Manager.
- 1.4 Submit a summary of total Research Costs to the Project Manager.
- 1.5 Conduct meetings related to the Research in such a way to ensure that such meetings are not held in states that are identified by the Attorney General pursuant to Government Code section 11139.8, subd.(e). The list of states identified by the Attorney General can be found here: <https://oag.ca.gov/ab1887> (or other web address in effect at the time). No work or travel outside the State of California is permitted in connection with the Research unless the Division provides prior written authorization. Failure to comply with this restriction may result in termination of this Agreement, pursuant to Exhibit C.

2. Research Implementation

2.1 Electrochemical Advanced Oxidation (Component 1, NAWI Task 6.12)

Component Overview: The research will create an electrochemical treatment module for oxidizing organic contaminants under conditions encountered in distributed water treatment systems. The module will employ a carbon-based gas-diffusion cathode to reduce O_2 to hydrogen peroxide (H_2O_2) (hereafter, carbon cathode). Next, a mesh stainless steel cathode will reduce H_2O_2 to hydroxyl radical (HO^\bullet) (hereafter, steel cathode). To complete the cell and lower the solution pH, residual contaminants will be oxidized on a 3D boron-doped reduced graphene oxide anode (hereafter, anode) upstream of the two cathodes. The three electrodes will be combined in series to create a flow-through modular treatment system prototype. NAWI funding will be used for the initial research on the different components of the modular treatment system, after which State Water Board funds will be used to support the development and testing of an integrated treatment module.

Objective: Develop and evaluate a prototype of an integrated electrochemical advanced oxidative treatment process that could operate entirely on electricity and be applied to small-scale distributed water treatment. (NAWI Activity 6.12.5: Integration of electrodes into a treatment module)

- 2.1.1 Evaluate the results from the individual performance assessments of the carbon cathode, steel cathode, and anode to determine the optimal range of system conditions, including relative electrode areas, applied current densities, and flow rates. Identify targets for electrode material costs, energy consumption, and component lifetime, as well as metal leaching and byproduct formation. Develop a summary of performance criteria needed to justify further development of the electrodes and unit processes. Submit the summary to the Technical Liaison for review and the Project Manager for approval.
- 2.1.2 Design and construct a prototype electrochemical treatment module for oxidizing organic contaminants capable of operating over the range of conditions expected in small-scale distributed water treatment systems. Use synthetic groundwater and surface water amended with representative trace organic contaminants to conduct experiments on the prototype to evaluate scaling and fouling behavior and assess potential mitigation strategies (e.g., polarity reversal, weak acid washing).
 - 2.1.2.1 Develop a method to optimize operation of the anode to complete the circuit without diminution in performance. Develop a protocol for anode synthesis and a summary of results on anode performance in synthetic waters. Submit the protocol and summary to the Technical Liaison for review and the Project Manager for approval.
 - 2.1.2.2 Develop a method to optimize operation of carbon cathode to meet performance objectives at varying current and charge densities in synthetic water matrices. Summarize data on carbon cathode performance during long-term operation in representative synthetic

waters. Submit the summary to the Technical Liaison for review and the Project Manager for approval.

2.1.2.3 Identify optimal conditions (e.g., pH and potential) and determine metal leaching for H₂O₂ activation. Summarize data on H₂O₂ activation, HO[•] yields, and metal leaching tendency. Submit the summary to the Technical Liaison for review and the Project Manager for approval.

2.1.2.4 Demonstrate the ability of the anode to operate without the creation of levels of byproducts that pose human health risks. Conduct an analysis of synthetic waters to evaluate the formation of byproducts and oxidation of organic contaminants. Submit the results to the Technical Liaison for review and the Project Manager for approval.

2.1.3 Define a pH control strategy for the prototype of the integrated electrochemical system that does not lead to fouling or decreased system performance. Provide summary data on pH at each treatment stage for the different water types. Submit the summary to the Technical Liaison for review and the Project Manager for approval.

2.1.4 Identify the optimal configurations for the prototype of the integrated electrochemical system. Submit the data to the Technical Liaison for review and the Project Manager for approval.

2.1.5 Complete an analysis of energy consumption and initial cost of the integrated electrochemical system. Summarize the energy use and expected cost of prototype construction and operation under conditions encountered in representative synthetic waters. Submit the summary and expected cost to the Technical Liaison for review and the Project Manager for approval.

2.1.6 Reports

2.1.6.1 Develop a draft report summarizing the work completed in Items 2.1.1 through 2.1.5 and submit to the Technical Liaison and Project Manager for comment.

2.1.6.2 Develop a final report incorporating any comments received in Item 2.1.6.1 and submit to the Technical Liaison for review and the Project Manager for approval.

2.2 Process Twins for Decision-Support and Dynamic Energy/Cost Prediction in Water Reuse Processes (Component 2, NAWI Task 5.09)

Component Overview: This research seeks to lay a foundation for the application of advanced data analytics to water reuse process optimization by developing tools and methods to overcome challenges such as data sparsity, sensor issues, and transferability challenges, combining the development of a descriptive dynamic process and energy model with the predictions from a digital and physical twin couple used to emulate out-of-normal conditions in the plant for decision support. State Water Board funding will be used for the development of the physical small-scale unit process twin (hereafter, physical twin). NAWI

funding will be used for data collection from participating utilities, development of a computer-based hybrid machine-learning/mechanistic model (hereafter, digital twin), operation of the physical twin, and development of a model to integrate process performance and optimization with energy and cost factors.

Objective: Build small-scale water reuse treatment units (physical twin) with functionality analogous to that of full-scale water reuse installations, monitor process data trends over time in the case of anomalous operations, and track the decline in measurement performance of probes due to aging and fouling. (NAWI Activity 5.9.2. Development of Physical Twin)

2.2.1 Design of physical twin: Collaborate with fabricator to develop a design of physical twin and document all technical details. Include the design of the physical twin layout, physical and technical specifications for all hardware including filtration components (MF or UF, RO, and UV/AOP), comparison of physical twin units with pilots available at partnering utilities including documentation of components used in those systems, and translation of design drafts to fabrication-ready designs. Transmit fabrication-ready designs to the fabricator. Submit the design, specifications, comparison, and fabrication-ready designs to the Technical Liaison for review and the Project Manager for approval.

2.2.2 Fabrication of physical twin: Construct the physical twin in collaboration with an external partner. Document the physical twin units and develop the energy and initial cost analysis of the integrated system, and submit documentation and analysis to the Technical Liaison for review and the Project Manager for approval.

2.2.3 Reports

2.2.3.1 Develop a draft report summarizing the work completed in Items 2.2.1 and 2.2.2. and submit to the Technical Liaison and Project Manager for comment.

2.2.3.2 Develop a final report incorporating any comments received in Item 2.2.3.1 and submit to the Technical Liaison for review and the Project Manager for approval.

2.3 Application of Next-Generation Desalination to Agricultural Drainage (Component 3, NAWI Task 3.08)

Component Overview: This research addresses the potential for next-generation desalination technologies (e.g., technologies that enable zero-liquid discharge, nutrient recycling, selective contaminant removal and enhanced water recovery) to be applied in California's San Joaquin Valley. NAWI funding will be used to 1) analyze irrigation drainage water management strategies, including policy measures and application of available and emerging desalination technologies, 2) develop a dynamic economic regional framework to assess the costs of various approaches and project the likelihood of adoption of desalination systems for reuse of irrigation drainage water, and 3) conduct a stakeholder workshop to identify opportunities and barriers for application of desalination to irrigation drainage water.

State Water Board funding will be used to conduct interviews with key stakeholders and to evaluate performance enhancements and policy strategies needed for desalination and advanced water treatment technologies to achieve pipe parity (i.e., become cost-competitive with conventional water sources) and adoption in the San Joaquin Valley and other important agricultural regions of the United States.

Objective: Engage stakeholders through interviews to understand barriers and incentives for using desalination to manage irrigation drainage water while simultaneously expanding access to safe drinking water for rural residents affected by agricultural groundwater pollution and water scarcity. Develop research and policy recommendations for stakeholders to advance research efforts and facilitate adoption of desalination to increase water reuse and manage contaminants for agricultural water users and communities that are directly affected by agricultural activities. (NAWI Activity 3.8.4: Evaluate adoption challenges for application of next-generation desalination technologies for managing salts in irrigation drainage water)

2.3.1 Conduct interviews with key stakeholders & experts to investigate the institutional and policy arrangements that support adoption of next-generation desalination technologies, as well as impacts of key areas of uncertainty. Submit list of completed stakeholder interviews and dates to the Technical Liaison for review and the Project Manager for approval.

2.3.2 Reports

2.3.2.1 Develop a draft report summarizing the work completed in Item 2.3.1. Evaluate considerations not quantitatively captured by the economic model, including long-term sustainability, exposure of rural communities to contaminated drinking water, and other distributional effects of salt-management alternatives. Identify and compile key findings of NAWI-funded and State Water Board-funded research components, recommendations for future research, and the potential for application of agricultural desalination in other key regions of the United States. Submit the draft report to the Technical Liaison and Project Manager for comment.

2.3.2.2 Develop a final report incorporating any comments received in Item 2.3.2.1 and submit to the Technical Liaison for review and the Project Manager for approval.

2.4 Hybrid Electrochemical-Ion Exchange Process for Selective Phosphate Recovery as Struvite (Component 4, NAWI Task 6.19)

Component Overview: The research will develop and evaluate an electrochemistry and ion exchange (EC-IX) process to remove and recover phosphate (P) from wastewater. The Research Funds will be used to 1) test individual unit processes for selective P adsorption, regeneration, and precipitation and identify operational barriers; 2) develop, model, test, and optimize a modular EC-IX reactor for P recovery that incorporates the individual unit processes (adsorption, regeneration, precipitation) into a single module; and 3) perform cost and environmental impact

assessments to compare EC-IX to conventional P removal processes and optimize the EC-IX module to minimize costs and environmental impacts.

Objective: Develop and optimize the EC-IX process for P recovery from wastewater and evaluate its potential to deliver a more resilient, low-chemical input, flexible-scale process that would lower the cost and energy of P recovery for wastewater treatment and reuse applications. (NAWI Activity 6.19: Hybrid electrochemical-ion electron exchange for selective phosphate recovery as struvite)

2.4.1 Test selective P adsorption, regeneration, and precipitation as individual unit processes. Characterize and optimize selective phosphorus adsorption, regeneration, and recovery using experiments with P solutions, synthetic wastewaters, and real wastewater. Perform chemical imaging and micro-x-ray absorption spectroscopy to elucidate chemical kinetics and mass transport. Validate performance of each unit process. Submit a summary of the performance validation results to the Technical Liaison for review and the Project Manager for approval.

2.4.2 Design and construct a bench-scale EC-IX reactor combining the individual unit processes tested in Item 2.4.1.

2.4.2.1 Characterize and validate system operation through laboratory investigations using synthetic and real wastewaters, varying operating conditions to inform optimal parameters and determine system stability during multi-cycle operation. Monitor the migration and fate of desorbed organic compounds to characterize operational challenges that must be mitigated for long-term operation and provide data input for the Techno-Economic Analysis and Life Cycle Assessment. Submit a summary of EC-IX reactor system validation and optimization to the Technical Liaison for review and the Project Manager for approval.

2.4.2.2 Develop a combined process model for the entire EC-IX process that approximates adsorption, regeneration, and precipitation performance within ten percent (10%) error. Submit a summary of EC-IX reactor system process model to the Technical Liaison for review and the Project Manager for approval.

2.4.3 Conduct Techno-Economic Analysis and Life Cycle Assessment and evaluate the impact of scale on results. For the Techno-Economic Analysis, adapt the process model from Item 2.4.2.2 to estimate the cost and energy use of EC-IX as a function of feed water quality and operating parameters. For the Life Cycle Assessment, compare EC-IX chemical and energy consumption to chemical regeneration and existing struvite recovery using bench-scale operation data. Submit results and summary to the Technical Liaison for review and the Project Manager for approval.

2.4.4 Reports

2.4.4.1 Develop a draft report summarizing the work completed in Items 2.4.1 through 2.4.3 and submit to Project Manager and Technical Liaison for comment.

2.4.4.2 Develop a final report incorporating any comments received in Item 2.4.4.1 and submit to the Project Manager for review and Technical Liaison for approval.

A-4. Disclosure

The Recipient shall include the following disclosure statement in any document, written report, or brochure prepared in whole or in part pursuant to this Agreement:

“Funding has been provided in full or in part through an agreement with the State Water Resources Control Board using funds from Proposition 1. The contents of this document do not necessarily reflect the views and policies of the foregoing, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.”

A-5. Reporting

- (a) **Progress Reports.** The Recipient shall submit quarterly progress reports, using a format provided by the Project Manager, within forty-five (45) days following the end of the calendar quarter (March, June, September, and December) to the Project Manager and Technical Liaison. Progress reports shall provide a brief description of activities that have occurred, milestones achieved, monitoring results (if applicable), and any problems encountered in the performance of the work under this Agreement during the applicable reporting period. Reporting shall be required even if no grant-related activities occurred during the reporting period. The Recipient shall document all activities and expenditures in progress reports, including work performed by contractors.
- (b) **As Needed Information or Reports.** The Recipient agrees to provide expeditiously, during the term of this Agreement, such reports, data, and information as may be reasonably required by the Division including, but not limited to, material necessary or appropriate for evaluation of the funding program or to fulfill any reporting requirements of the state or federal government.
- (c) **Annual Progress Summaries.** The Recipient shall prepare and submit an Annual Progress Summary, using a format provided by the Project Manager, annually by November 15 that covers the time period from October 1 of the previous year through September 30 of the current year to the Technical Liaison and Project Manager. The summary must be no more than five (5) pages and shall include pictures as appropriate. The summary shall include, at a minimum, the following:
 - (1) A summary of the Research objective, the scope of the Research, and a description of the approach used to achieve the Research objective.

- (2) A summary of the progress made to date, significant milestones achieved, and the current schedule of completing the Research.

A-6. Research Schedule

Failure to provide items by the due dates indicated in the Research Schedule below may constitute a material violation of this Agreement. However, the dates in the “Estimated Due Date” column of this Research Schedule may be adjusted as necessary during the Reimbursement Period with Project Manager approval. All work or submittals must be achieved with relevant submittals approved by the Division prior to the Research Completion Date, and the final Reimbursement Request submitted prior to the Final Reimbursement Request Date set forth on the Cover Page of this Agreement.

ITEM	DESCRIPTION OF SUBMITTAL	CRITICAL DUE DATE	ESTIMATED DUE DATE
EXHIBIT A-3 – RESEARCH-SPECIFIC SCOPE OF WORK			
1.	Research Administration		
1.2	Notification of upcoming meetings, workshops, webinars, and trainings		At Least 15 Working Days Prior to Event
1.4	Summary of Research Costs		December 2023
2.	Research Implementation		
2.1	Electrochemical Advanced Oxidation (Component 1)		
2.1.1	Summary of performance criteria needed to justify further development of electrodes and unit processes		November 2022 <u>Completed</u>
2.1.2.1	Protocol for anode synthesis and summary of results on anode performance in synthetic waters		July 2023 <u>December 2023</u>
2.1.2.2	Summary of data on carbon cathode performance during long-term operating in representative synthetic waters		July 2023 <u>December 2023</u>
2.1.2.3	Summary of data on H ₂ O ₂ activation, HO [•] yields, and metal leaching tendency		July 2023 <u>Completed</u>
2.1.2.4	Results of analysis of synthetic waters to evaluate byproduct formation and organic contaminant oxidation		July 2023
2.1.3	Summary data on pH at various treatment stages for different water types provided		July 2023 <u>December 2023</u>

ITEM	DESCRIPTION OF SUBMITTAL	CRITICAL DUE DATE	ESTIMATED DUE DATE
2.1.4	Data on contaminant removal under different configurations and operating conditions		September 2023 <u>January 2024</u>
2.1.5	Summary of energy use and expected cost of prototype construction and operation under conditions encountered in representative synthetic waters		December 2023 <u>April 2024</u>
2.1.6.1	Draft Report, Component 1	January 31, 2024 <u>July 31, 2024</u>	
2.1.6.2	Final Report, Component 1	February 29, 2024 <u>August 31, 2024</u>	
2.2	Process Twins for Decision-Support and Dynamic Energy/Cost Prediction in Water Reuse Processes (Component 2)		
2.2.1	Physical twin unit design, specifications, comparison, and fabrication-ready design		January 2023 <u>June 2023</u>
2.2.2	Documentation of the physical twin units and energy and initial cost analysis		December 2023 <u>September 2024</u>
2.2.3.1	Draft Report, Component 2	January 31, 2024 <u>January 31, 2025</u>	
2.2.3.2	Final Report, Component 2	February 29, 2024 <u>February 28, 2025</u>	
2.3	Application of Next-Generation Desalination to Agricultural Drainage (Component 3)		
2.3.1	List of completed stakeholder interviews and dates		August 2023 <u>July 2024</u>
2.3.2.1	Draft Report, Component 3	January 31, 2024 <u>January 31, 2025</u>	
2.3.3.2	Final Report, Component 3	February 29, 2024 <u>February 28, 2025</u>	
<u>2.4</u>	<u>Hybrid Electrochemical-Ion Exchange Process for Selective Phosphate Recovery as Struvite (Component 4)</u>		
<u>2.4.1</u>	<u>Summary of performance validation results</u>		<u>March 2024</u>
<u>2.4.2.1</u>	<u>Summary of EC-IX reactor system validation and optimization</u>		<u>February 2025</u>
<u>2.4.2.2</u>	<u>Summary of EC-IX reactor system process model</u>		<u>February 2025</u>

ITEM	DESCRIPTION OF SUBMITTAL	CRITICAL DUE DATE	ESTIMATED DUE DATE
<u>2.4.3</u>	<u>Results and Summary of Techno-Economic Analysis and Life Cycle Assessment</u>		<u>May 2025</u>
<u>2.4.4.1</u>	<u>Draft Report, Component 4</u>		<u>July 2025</u>
<u>2.4.4.2</u>	<u>Final Report, Component 4</u>	<u>September 30, 2025</u>	
EXHIBIT A-5 – REPORTS			
(a)	Progress Reports	Quarterly	
(b)	As Needed Reports		As Needed
(c)	Annual Progress Summary	Annually by November 15	
EXHIBIT B – FUNDING TERMS			
B-7(b)(5)	Reimbursement Requests	Quarterly	
B-7(b)(9)	Final Reimbursement Request	April 30, 2024 <u>December 31, 2025</u>	

EXHIBIT B – FUNDING TERMS

B-1. Research Funding

Subject to the terms of this Agreement, the State Water Board agrees to provide Research Funds not to exceed the amount of the Research Funding Amount set forth on the Cover Page of this Agreement.

B-2. Funding Dates

- (a) The Eligible Start Date is set forth on the Cover Page of this Agreement. Otherwise eligible costs incurred prior to this date will not be reimbursed.
- (b) The Final Reimbursement Request Date is set forth on the Cover Page of this Agreement. ~~The Deputy Director of the Division may extend this date for good cause.~~ Extensions will require an amendment to this Agreement. All Reimbursement Requests must be submitted to the Division such that they are received prior to this date. Late Reimbursement Requests will not be honored, and remaining amounts will be deobligated.

B-3. Funding Conditions and Exclusions

The State Water Board’s reimbursement of funds hereunder is contingent on the Recipient’s compliance with the terms and conditions of this Agreement.

Research Funds may not be used for any Indirect Costs. Any Reimbursement Request submitted including Indirect Costs will cause that Reimbursement Request, in its entirety, to be disputed and will not be paid until the dispute is resolved. This prohibition applies to the Recipient and any subcontract or sub-agreement for work on the Research that will be reimbursed with Research Funds pursuant to this Agreement. (Gov. Code, § 16727.)

B-4. Budget Summary

Budget costs are contained in the Summary Research Cost Table below:

LINE ITEM	RESEARCH FUNDS	TOTAL RESEARCH COST
Direct Project Administration	\$100,000	\$100,000
Planning/Design/Engineering/Environmental	\$468,194	\$468,194
	\$919,157	\$919,157
Construction/Implementation	\$405,438	\$405,438
	\$620,188	\$620,188
Equipment	\$0	\$0
	\$858,655	\$858,655
Monitoring/Performance	\$2,000	\$2,000
Education/Outreach	\$0	\$0
TOTAL	\$975,632	\$975,632
	\$2,500,000	\$2,500,000

B-5. Budget Flexibility

- (a) Subject to the prior review and approval of the Project Manager, adjustments between existing line items may be used to defray allowable direct costs up to fifteen percent (15%) of the total amount, including any amendment(s) thereto. Line item adjustments in excess of fifteen percent (15%) require an Agreement amendment. If the detailed budget includes an amount for the Recipient's personnel costs, that amount is based on the time worked (i.e. hours), classifications, and rates submitted by the Recipient in its application. Any changes to the time worked, classifications, and rates must be approved, in advance and in writing, by the Project Manager. Time worked calculations will be based on hours worked unless a different time-based calculation methodology is agreed to in writing by the Recipient and the Division prior to execution of this Agreement.
- (b) The Recipient may submit a request for an adjustment in writing to the Project Manager. Such adjustment may not increase or decrease the total Research Funding Amount. The Recipient shall submit a copy of the original Agreement budget reflecting the requested changes and shall note proposed changes by striking out the original amount(s) followed with proposed change(s) in bold and underlined. Budget adjustments deleting a budget line item or adding a new budget line item shall require a formal amendment. The Division may also propose budget adjustments.
- (c) The sum of adjusted line items shall not exceed the total budget amount.

B-6. Amounts Payable by the Recipient

The Recipient agrees to pay any and all costs connected with the Research performed by the Recipient, including, without limitation, any and all Research Costs that are not attributable to Research performed by subrecipient(s) under this Agreement. The Recipient must include the following language in any agreement with subrecipient(s) pursuant to this Agreement: "If the Research Funds are not sufficient to pay the Research Costs in full, the [subrecipient] shall nonetheless complete the Research and pay that portion of the Research Costs in excess of available Research Funds, and shall not be entitled to any reimbursement therefor from [Recipient] or the State Water Board."

B-7. Reimbursement of Research Funds; Availability of Research Funds

- (a) The State Water Board's obligation to disburse Research Funds is contingent upon the availability of sufficient funds to permit the reimbursements provided for herein. If sufficient funds are not available for any reason including, but not limited to, failure of the State government to appropriate funds necessary for reimbursement of Research Funds, the State Water Board shall not be obligated to make any reimbursements to the Recipient under this Agreement. This provision shall be construed as a condition precedent to the obligation of the State Water Board to make any reimbursements under this Agreement. Nothing in this Agreement shall be construed to provide the Recipient with a right of priority for reimbursement over any other recipient. If any reimbursements due the Recipient under this Agreement are deferred because sufficient funds are

unavailable, it is the intention of the State Water Board that such reimbursement will be made to the Recipient when sufficient funds do become available, but this intention is not binding. If this Agreement's funding for any fiscal year expires due to reversion or is reduced, substantially delayed, or deleted by the Budget Act, by Executive Order, or by order or action of the Department of Finance, the State Water Board has the option to either cancel this Agreement with no liability accruing to the State, or offer an amendment to the Recipient to reflect the reduced amount.

- (b) Except as may be otherwise provided in this Agreement, reimbursement of Research Funds will be made as follows:
- (1) Upon execution and delivery of this Agreement, the Recipient may submit a Reimbursement Request for eligible Research Costs to the State Water Board using the reimbursement request forms provided by the Project Manager.
 - (2) Reimbursement Requests shall contain the following information:
 - a. The date of the request;
 - b. The time period covered by the request, i.e., the term "from" and "to";
 - c. The total amount requested;
 - d. Original signature and date (in ink) or electronic signature, consistent with the State Water Board's approved procedures, of the Recipient's Project Director or their designee; and
 - e. The Final Reimbursement Request shall be clearly marked "FINAL REIMBURSEMENT REQUEST" and shall be submitted NO LATER THAN the Final Reimbursement Request Date.
 - (3) The Recipient may sign Reimbursement Requests either by an electronic signature consistent with the State Water Board's approved procedures or by a physical, handwritten signature. The parties mutually agree that an electronic signature consistent with the State Water Board's approved procedures is the same as a physical, handwritten signature for the purposes of validity, enforceability, and admissibility.
 - (4) Reimbursement Requests must be itemized based on the line items specified in the budget in this Exhibit. Reimbursement Requests must be signed by the Project Director or their designee and must be addressed to the Project Manager as set forth in the Party Contacts section of this Agreement. Reimbursement Requests submitted in any other format than the one provided by the State Water Board will cause a Reimbursement Request to be disputed. In the event of such a dispute, the Project Manager will notify the Recipient. Payment will not be made until the dispute is resolved and a corrected Reimbursement Request is submitted. The Project Manager has the responsibility for approving

Reimbursement Requests. Reimbursement Requests must be complete and signed by the Recipient's Project Director or their designee. Research Costs incurred prior to the Eligible Start Date of this Agreement will not be reimbursed.

- (5) Research Funds must be requested quarterly via Reimbursement Request for eligible costs incurred during the reporting period of the corresponding Progress Report, describing the activities and expenditures for which the reimbursement is being requested. Each Reimbursement Request must be accompanied by a Progress Report. Failure to provide timely Reimbursement Requests may result in such requests not being honored.
- (6) The Recipient agrees that it will not submit any Reimbursement Requests that include any Research Costs until such costs have been incurred and are currently due and payable by the Recipient; although, the actual payment of such costs by the Recipient is not required as a condition of the Reimbursement Request. Supporting documentation (e.g., receipts) must be submitted with each Reimbursement Request. The amount requested for administration costs must include a calculation formula (i.e., hours or days worked times the hourly or daily rate = total amount claimed). Reimbursement of Research Funds will be made only after receipt of a complete, adequately supported, properly documented and accurately addressed Reimbursement Request.
- (7) The Recipient will not seek reimbursement of any Research Costs that have been reimbursed from other funding sources.
- (8) The Recipient shall use Research Funds within thirty (30) days of receipt to reimburse contractors, vendors, and other Research Costs. Any interest earned on Research Funds shall be reported to the State Water Board and will either be required to be returned to the State Water Board or deducted from future reimbursements. In the event that the Recipient fails to disburse Research Funds to contractors or vendors within thirty (30) days from receipt of the Research Funds, the Recipient shall immediately return such Research Funds to the State Water Board. Interest shall accrue on such Research Funds from the date of reimbursement through the date of mailing of Research Funds to the State Water Board. If the Recipient held such Research Funds in interest-bearing accounts, any interest earned on the Research Funds shall also be due to the State Water Board.
- (9) The Recipient shall submit its final Reimbursement Request no later than the Final Reimbursement Request Date specified herein. If the Recipient fails to do so, then the undisbursed balance of this Agreement may be deobligated.
- (10) The Recipient agrees that it will not request a reimbursement unless that cost is allowable, reasonable, and allocable.

- (11) Notwithstanding any other provision of this Agreement, no reimbursement shall be required at any time or in any manner that is in violation of or in conflict with federal or state laws, policies, or regulations.
- (12) The Recipient agrees that it shall not be entitled to interest earned on undisbursed Research Funds.
- (13) No work or travel outside the State of California is permitted under this Agreement unless the Division provides prior written authorization. No work or travel outside the United States of America is authorized. If Recipient, or any subrecipient, fail to comply with this restriction, the Division may disallow any costs incurred related to such travel. Any reimbursement for necessary travel and per diem shall be at rates not to exceed those set by the California Department of Human Resources at <http://www.calhr.ca.gov/employees/Pages/travel-reimbursements.aspx>. as of the date costs are incurred by the Recipient.
- (14) At the Division's request, the Recipient must include any other documents or requests required or allowed under this Agreement.

B-8. Withholding of Reimbursements and Material Violations

- (a) Notwithstanding any other provision of this Agreement, the Recipient agrees that the State Water Board may retain an amount equal to ten percent (10%) of the Research Funds until Research Completion. Any retained amounts due to the Recipient will be promptly disbursed to the Recipient, without interest, upon Research Completion.
- (b) The State Water Board may withhold all or any portion of the funds provided for by this Agreement in the event that:
 - (1) The Recipient has materially violated, or threatens to materially violate, any term, provision, condition, or commitment of this Agreement; or
 - (2) The Recipient fails to maintain reasonable progress toward Research Completion.

B-9. Remaining Balance

In the event the Recipient does not request all of the Research Funds encumbered under this Agreement, any remaining Research Funds revert to the State.

B-10. Fraud and Misuse of Public Funds

All Reimbursement Requests submitted shall be accurate and signed under penalty of perjury. Any and all costs submitted pursuant to this Agreement shall only be for the tasks set forth herein. The Recipient shall not submit any Reimbursement Request containing costs that are ineligible or have been reimbursed from other funding sources unless required and specifically noted as such. Any eligible costs for which the Recipient is seeking reimbursement shall not be

reimbursed from any other source. Double or multiple billing for time, services, or any other eligible cost is illegal and constitutes fraud. Any suspected occurrences of fraud, forgery, embezzlement, theft, or any other misuse of public funds may result in suspension of reimbursements of Research Funds and/or termination of this Agreement requiring the repayment of all funds disbursed hereunder. Additionally, the Deputy Director of the Division may request an audit and refer the matter to the Attorney General's Office or the appropriate district attorney's office for criminal prosecution or the imposition of civil liability. (Civ. Code, §§ 1572-1573; Pen. Code, §§ 470, 489-490.)

EXHIBIT C – GENERAL TERMS AND CONDITIONS

C-1. Access and Public Records

The Recipient shall ensure that the State Water Board, the Governor of the State, the State Auditor, or any authorized representative of the foregoing, will have safe and suitable access to the Research site at all reasonable times during Research work. The Recipient acknowledges that the Research records and locations are public records, except as provided under State law, including, but not limited to, all of the submissions accompanying the application, all of the documents incorporated by Exhibit A, and all reports, Reimbursement Requests, and supporting documentation submitted hereunder.

C-2. Amendment

No amendment or variation of the terms of this Agreement shall be valid unless made in writing, signed by the parties, and approved as required. No oral understanding or agreement not incorporated in this Agreement is binding on any of the parties.

C-3. Assignability

This Agreement is not assignable by the Recipient, either in whole or in part, without the consent of the State Water Board in the form of a formal written amendment to this Agreement.

C-4. Audits and Accounting Standards

- (a) The Division may call for an audit of financial information relative to the Research if the Division determines that an audit is desirable to assure program integrity or if an audit becomes necessary because of state or federal requirements. If an audit is called for, the audit shall be performed by a Certified Public Accountant independent of the Recipient and at the cost of the Recipient. The audit shall be in the form required by the Division.
- (b) Audit disallowances will be returned to the State Water Board. Failure to comply with audit disallowance provisions may disqualify the Recipient from participating in State Water Board funding programs.
- (c) The Recipient shall maintain accounts in accordance with GAAP as issued by the Governmental Accounting Standards Board or its successor. The Recipient agrees that, at a minimum, its fiscal control and accounting procedures will be sufficient to permit preparation of reports for the tracking of Research Funds to a level of expenditure adequate to establish that such funds have not been used in violation of state law or the terms of this Agreement.

C-5. Claims

Any claim of the Recipient is limited to the rights, remedies, and claims procedures provided to the Recipient under this Agreement.

C-6. Competitive Bidding

The Recipient shall adhere to any applicable state law or local ordinance for competitive bidding and applicable labor laws. The Recipient shall not award a construction contract until a summary of bids and identification of the selected lowest responsible bidder is submitted to and approved in writing by the Division. The Recipient must provide a full explanation if the Recipient is proposing to award a construction contract to anyone other than the lowest responsible bidder.

C-7. Compliance with Law

The Recipient shall, at all times, comply with and require its contractors and subcontractors to comply with all applicable federal and state laws, rules, guidelines, regulations, and requirements.

C-8. Conflict of Interest

The Recipient certifies that all owners, officers, directors, agents, representatives, and employees in its Research Grants Program Office are in compliance with applicable state and federal conflict of interest laws.

C-9. Damages for Breach Affecting Tax-Exempt Status

In the event that any breach of any of the provisions of this Agreement by the Recipient shall result in the loss of tax-exempt status for any bonds of the State or any subdivision or agency thereof, including bonds issued on behalf of the State Water Board, or if such breach shall result in an obligation on the part of the State or any subdivision or agency thereof to reimburse the federal government by reason of any arbitrage profits, the Recipient shall immediately reimburse the State or any subdivision or agency thereof in an amount equal to any damages paid by or loss incurred by the State or any subdivision or agency thereof due to such breach. In the event that any breach of any of the provisions of this Agreement by the Recipient shall result in the failure of Research Funds to be used pursuant to the provisions of this Agreement, the Recipient shall immediately reimburse the State or any subdivision or agency thereof in an amount equal to any damages paid by or loss incurred by the State or any subdivision or agency thereof due to such breach.

C-10. Disputes

- (a) The Recipient may appeal a staff decision within thirty (30) days to the Deputy Director of the Division or designee, for a final Division decision. The Recipient may appeal a final Division decision to the State Water Board within thirty (30) days. The Office of the Chief Counsel of the State Water Board will prepare a summary of the dispute and make recommendations relative to its final resolution, which will be provided to the State Water Board's Executive Director and each State Water Board Member. Upon the motion of any State Water Board Member, the State Water Board will review and resolve the dispute in the manner determined by the State Water Board. Should the State Water Board determine not to review the final Division decision, this decision will represent a final agency action on the dispute.

- (b) This clause does not preclude consideration of legal questions, provided that nothing herein shall be construed to make final the decision of the State Water Board, or any official or representative thereof, on any question of law.
- (c) The Recipient shall continue with the responsibilities under this Agreement during any dispute.
- (d) This section relating to disputes does not establish an exclusive procedure for resolving claims within the meaning of Government Code sections 930 and 930.4.

C-11. [Reserved]

C-12. Governing Law

This Agreement is governed by and shall be interpreted in accordance with the laws of the State of California.

C-13. Income Restrictions

The Recipient agrees that any refunds, rebates, credits, or other amounts (including any interest thereon) accruing to or received by the Recipient under this Agreement shall be paid by the Recipient to the State Water Board, to the extent that they are properly allocable to costs for which the Recipient has been reimbursed by the State Water Board under this Agreement.

C-14. Indemnification and State Reviews

The parties agree that review or approval of Research plans and specifications by the State Water Board is for administrative purposes only, including conformity with application and eligibility criteria, and expressly not for the purposes of design defect review or construction feasibility, and does not relieve the Recipient of its responsibility to properly plan, design, construct, operate, and maintain the Research.

To the extent permitted by law, the Recipient agrees to indemnify, defend, and hold harmless the State Water Board, and any trustee, and their officers, employees, and agents, if any (collectively, "Indemnified Persons"), against any loss or liability arising out of any claim or action brought against any Indemnified Persons from and against any and all losses, claims, damages, liabilities, or expenses, of every conceivable kind, character, and nature whatsoever arising out of, or resulting from, but only in proportion and to the extent such losses, claims, damages, liabilities, or expenses resulted from the Recipient's actions, (1) the Recipient's performance of the Research or the conditions, use, possession, conduct, or management of, work done in or about, or the planning, design, acquisition, installation, or construction, of the Recipient's performance of Research or any part thereof; (2) the Recipient's carrying out of any of the transactions contemplated by this Agreement or any related document; (3) any violation by the Recipient of any applicable law, rule or regulation, any environmental law (including, without limitation, the Federal Comprehensive Environmental Response, Compensation and Liability Act, the Resource Conservation and Recovery Act, the California Hazardous Substance Account Act, the Federal Water Pollution Control Act, the Clean Air Act, the Toxic Substances Control Act, the Occupational Safety and Health Act, the Safe Drinking Water Act, the California

Hazardous Waste Control Law, and California Water Code Section 13304, and any successors to said laws), rule or regulation or the release of any toxic substance on or near the Research; or (4) any untrue statement or alleged untrue statement of any material fact or omission or alleged omission to state a material fact necessary to make the statements required to be stated therein, in light of the circumstances under which they were made, not misleading with respect to any information provided by the Recipient for use in any disclosure document utilized in connection with any of the transactions contemplated by this Agreement. The Recipient shall also provide for the defense and indemnification of the Indemnified Parties in any contractual provision extending indemnity to the Recipient in any contract let for the performance of any work under this Agreement, and shall cause the Indemnified Parties to be included within the scope of any provision for the indemnification and defense of the Recipient in any contract or subcontract. To the fullest extent permitted by law, but only in proportion and to the extent such losses, claims, damages, liabilities, or expenses resulted from Recipient's actions, the Recipient agrees to pay and discharge any judgment or award entered or made against Indemnified Persons with respect to any such claim or action, and any settlement, compromise or other voluntary resolution. The provisions of this section shall survive the term of this Agreement and the discharge of the Recipient's obligation hereunder.

If the Recipient provides funds to any subawardee or assists or enters into an agreement with a subaward recipient to accomplish any of the work of this Agreement, the Recipient shall first enter into a written agreement with each subawardee by which the subawardee agrees to indemnify and hold harmless the Indemnified Persons from any and all liabilities, losses, claims, demands, damages, or costs, including without limitation litigation costs and attorney's fees, resulting from or arising out of the subawardee's performance under its agreement with the Recipient, but only in proportion to and to the extent such liability, loss, expense, attorneys' fees, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of the subawardees their respective officers, agents or employees. The foregoing does not limit any breach of contract action that the State Water Board may have against the Recipient.

C-15. Independent Actor

The Recipient, and its agents and employees, if any, in the performance of this Agreement, shall act in an independent capacity and not as officers, employees, or agents of the State Water Board.

C-16. Insurance

The Recipient shall maintain any insurance necessary to protect against losses that might disrupt or delay the Research or otherwise cause a material violation of this Agreement.

C-17. Integration

This Agreement is the complete and final Agreement between the parties.

C-18. Non-Discrimination Clause

- (a) During the performance of this Agreement, the Recipient and its contractors and subcontractors shall not unlawfully discriminate, harass, or allow harassment

against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, sexual orientation, physical disability (including HIV and AIDS), mental disability, medical condition (cancer), age (over 40), marital status, denial of family care leave, or genetic information, gender, gender identity, gender expression, or military and veteran status.

- (b) The Recipient, its contractors, and subcontractors shall ensure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment.
- (c) The Recipient, its contractors, and subcontractors shall comply with the provisions of the Fair Employment and Housing Act and the applicable regulations promulgated thereunder. (Gov. Code, §12990, subds. (a)-(f) et seq.; Cal. Code Regs., tit. 2, § 7285 et seq.) Such regulations are incorporated into this Agreement by reference and made a part hereof as if set forth in full.
- (d) The Recipient, its contractors, and subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.
- (e) The Recipient shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under this Agreement.

C-19. No Obligation of the State

Any obligation of the State Water Board herein contained shall not be an obligation, debt, or liability of the State and any such obligation shall be payable solely out of the monies encumbered pursuant to this Agreement.

C-20. No Third Party Rights

The parties to this Agreement do not create rights in, or grant remedies to, any third party as a beneficiary of this Agreement, or of any duty, covenant, obligation, or undertaking established herein.

C-21. Other Assistance

If funding for Research Costs is made available to the Recipient from sources other than this Agreement, the Recipient shall notify the Division. The Recipient may retain such funding up to an amount which equals the Recipient's local share of Research Costs. To the extent allowed by requirements of other funding sources, excess funding shall be remitted to the State Water Board.

C-22. Permits, Subcontracting, and Remedies

The Recipient shall comply in all material respects with all applicable federal, state and local laws, rules and regulations. The Recipient shall procure all permits, licenses and other authorizations necessary to accomplish the Recipient's work contemplated under this Agreement. The Recipient shall ensure that its subrecipient(s) procure all permits, licenses and

other authorizations necessary to accomplish the work contemplated in any agreement with the subrecipient(s). The Recipient shall pay all charges and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work. Signed copies of any such permits or licenses shall be submitted to the Division upon the Division's request.

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 State Water Board 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 State Water Board'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 State Water Board program for which funding under this Agreement is authorized. The State Water Board's List of Disqualified Businesses and Persons is located at

http://www.waterboards.ca.gov/water_issues/programs/enforcement/fwa/dbp.shtml

C-23. Prevailing Wages

If applicable, the Recipient agrees to be bound by all applicable provisions of State Labor Code regarding prevailing wages. If applicable, the Recipient must monitor all agreements subject to reimbursement from this Agreement to ensure that the prevailing wage provisions of the State Labor Code are being met. Division of Industrial Relations (DIR) requirements may be found at: <http://www.dir.ca.gov/lcp.asp>. For more information, please refer to DIR's Public Works Manual at: <http://www.dir.ca.gov/dlse/PWManualCombined.pdf>.

C-24. Professionals

The Recipient agrees that only professionals with valid licenses in the State of California will be used to perform services under this Agreement where such services are called for. All technical reports required pursuant to this Agreement that involve planning, investigation, evaluation, design, or other work requiring interpretation and proper application of engineering, architecture, or geologic sciences shall be prepared by or under the direction of persons registered to practice in California. All technical reports must contain the statement of the qualifications of the responsible registered professional(s). Technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

C-25. Public Funding

This Research is publicly funded. Any service provider or contractor with which the Recipient contracts must not have any role or relationship with the Recipient, that, in effect, substantially limits the Recipient's ability to exercise its rights, including cancellation rights, under the contract, based on all the facts and circumstances.

C-26. Recipient's Responsibility for Work

The Recipient shall be responsible for all work and for persons or entities engaged in work performed pursuant to this Agreement including, but not limited to, contractors, subcontractors,

suppliers, and providers of services. The Recipient shall be responsible for responding to any and all disputes arising out of its contracts for work on the Research. The State Water Board will not mediate disputes between the Recipient and any other entity concerning responsibility for performance of work.

C-27. Records

- (a) Without limitation of the requirement to maintain Research accounts in accordance with GAAP, the Recipient shall:
- (1) Establish an official file for the Research which adequately documents all significant actions relative to the Research;
 - (2) Establish separate accounts which will adequately and accurately depict all amounts received and expended on the Research, including all assistance funds received under this Agreement;
 - (3) Establish separate accounts which will adequately depict all income received which is attributable to the Research, specifically including any income attributable to assistance funds disbursed under this Agreement;
 - (4) Establish an accounting system which will accurately depict final total costs of the Research, including both direct and indirect costs;
 - (5) Establish such accounts and maintain such records as may be necessary for the State to fulfill federal reporting requirements, including any and all reporting requirements under federal tax statutes or regulations; and
 - (6) If Force Account is used by the Recipient for any phase of the Research, other than for planning, design, and construction engineering and administration provided for by allowance, accounts will be established which reasonably document all employee time worked charged to the Research and the associated tasks performed by each employee. Indirect Costs are not eligible for funding.
- (b) The Recipient shall maintain separate books, records and other material relative to the Research. The Recipient shall also retain such books, records, and other material for itself and for each contractor or subcontractor who performed or performs work on this Research for a minimum of thirty-six (36) years after Research Completion. The Recipient shall require that such books, records, and other material are subject at all reasonable times (at a minimum during normal business hours) to inspection, copying, and audit by the State Water Board, the Department of Finance, the Bureau of State Audits, the California State Auditor, the California State Controller, or any authorized representatives of the aforementioned. The Recipient shall allow and shall require its contractors to allow interviews during normal business hours of any employees who might reasonably have information related to such records. The Recipient agrees to include a similar duty regarding audit, interviews, and records retention in any

contract or subcontract related to the performance of this Agreement. The provisions of this section shall survive the term of this Agreement.

C-28. Related Litigation

Under no circumstances may the Recipient use Research Funds from any reimbursement under this Agreement to pay costs associated with any litigation the Recipient pursues against the State Water Board or any Regional Water Quality Control Board.

C-29. Reports

The Recipient shall provide expeditiously, during the term of this Agreement, any reports, data, and information reasonably required by the Division including, but not limited to, material necessary or appropriate for evaluation of the funding program or to fulfill any reporting requirements of the state or federal government.

C-30. Rights in Data

The Recipient agrees that, to the extent legally able, all data, plans, drawings, specifications, reports, computer programs, operating manuals, notes, and other written or graphic work required to be delivered to the Division under this Agreement are subject to the rights of the State as set forth in this section. The State shall have the right to reproduce, publish, and use all such work, or any part thereof, in any manner and for any purposes whatsoever and to authorize others to do so. If any such work is copyrightable, the Recipient may copyright the same, except that, as to any work which is copyrighted by the Recipient, the State reserves a royalty-free, nonexclusive, and irrevocable license to reproduce, publish, and use such work, or any part thereof, and to authorize others to do so, and to receive electronic copies from the Recipient upon request.

The Recipient shall comply with the California Taxpayer Access to Publicly Funded Research Act (Gov. Code section 13989 et seq). As a condition of receiving disbursements under this Agreement, the Recipient shall (1) ensure that any publishing or copyright agreement concerning peer-reviewed manuscripts comply with Government Code section 13989.6; and (2) report to the State Water Board on the final disposition of a peer-reviewed manuscript including, but not limited to, if it was published, when it was published, where it was published, and, when the 12-month time period expires pursuant to subdivision (b) of Government Code section 13989.6 expires, where the peer-reviewed manuscript will be available for open access.

C-31. State Cross-Cutters

The Recipient represents that, as applicable, it complies and covenants to maintain compliance with the following for the term of the Agreement:

- (a) The California Environmental Quality Act (CEQA), as set forth in Public Resources Code 21000 et seq. and in the CEQA Guidelines at Title 14, Division 6, Chapter 3, section 15000 et seq.
- (b) Water Conservation requirements, including regulations in Division 3 of Title 23 of the California Code of Regulations.

- (c) Monthly Water Diversion Reporting requirements, including requirements set forth in Water Code section 5103.
- (d) Public Works Contractor Registration with Department of Industrial Relations requirements, including requirements set forth in sections 1725.5 and 1771.1 of the Labor Code.
- (e) Volumetric Pricing & Water Meters requirements, including the requirements of Water Code sections 526 and 527.
- (f) Urban Water Management Plan requirements, including the Urban Water Management Planning Act (Water Code, § 10610 et seq.).
- (g) Urban Water Demand Management requirements, including the requirements of Water Code section 10608.56.
- (h) Delta Plan Consistency Findings requirements, including the requirements of Water Code section 85225 and California Code of Regulations, Title 23, section 5002.
- (i) Agricultural Water Management Plan Consistency requirements, including the requirements of Water Code section 10852.
- (j) Charter City Project Labor Requirements, including the requirements of Labor Code section 1782 and Public Contract Code section 2503.
- (k) The Recipient agrees that it will, at all times, comply with and require its contractors and subcontractors to comply with directives or orders issued pursuant to Division 7 of the Water Code.

C-32. State Water Board Action; Costs and Attorney Fees

Any remedy provided in this Agreement is in addition to and not in derogation of any other legal or equitable remedy available to the State Water Board as a result of breach of this Agreement by the Recipient, whether such breach occurs before or after completion of the Research, and exercise of any remedy provided by this Agreement by the State Water Board shall not preclude the State Water Board from pursuing any legal remedy or right which would otherwise be available. In the event of litigation between the parties hereto arising from this Agreement, it is agreed that each party shall bear its own costs and attorney fees.

C-33. Termination

This Agreement may be terminated by written notice at any time at the option of the State Water Board, upon an Event of Default or upon violation by the Recipient of any material provision of this Agreement after such violation has been called to the attention of the Recipient and after failure of the Recipient to bring itself into compliance with the provisions of this Agreement within a reasonable time as established by the Division.

C-34. Timeliness

Time is of the essence in this Agreement.

C-35. Unenforceable Provision

In the event that any provision of this Agreement is unenforceable or held to be unenforceable, then the parties agree that all other provisions of this Agreement have force and effect and shall not be affected thereby.

C-36. Venue

Any action arising out of this Agreement shall be filed and maintained in the Superior Court in and for the County of Sacramento, California.

C-37. Waiver and Rights of the State Water Board

Any waiver of rights by the State Water Board with respect to a default or other matter arising under this Agreement at any time shall not be considered a waiver of rights with respect to any other default or matter. Any rights and remedies of the State Water Board provided for in this Agreement are in addition to any other rights and remedies provided by law.

C-38. Web Content Accessibility

Upon request, the Recipient shall ensure that any data, plans, drawings, specifications, reports, computer programs, operating manuals, notes, and other written or graphic work submitted to the State Water Board required as a deliverable under this Agreement or uploaded directly to any State internet website or database in the performance of this Agreement comply with the accessible content requirements set forth in Government Code sections 7405 and 11135; section 508 of the federal Rehabilitation Act (29 USC 794d) and the regulations promulgated thereunder (36 CFR part 1194); and the most current Web Content Accessibility Guidelines published by the Web Accessibility Initiative of the World Wide Web Consortium at a minimum Level AA success criteria.

If the Recipient provides any electronic or information technology, or related services, under this Agreement, the Recipient must respond to and resolve any complaint brought to the attention of the Recipient regarding the accessibility of its products or services.

C-39. Drug-Free Workplace Certification

The Recipient certifies that it will provide a drug-free workplace in compliance with the Drug-Free Workplace Act (Gov. Code. §§ 8350-8357). The Recipient shall publish a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited in the Recipient's workplace and specifying the actions to be taken against employees for violations of the prohibition. The Recipient shall establish a drug-free awareness program to inform employees about the dangers of drug abuse in the workplace, the Recipient's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation and employee assistance programs, and penalties that may be imposed upon employees for drug abuse violations. The Recipient shall provide that every

employee who works on the Research receives a copy of the Recipient's drug-free workplace policy statement and agrees to abide by the terms of the statement as a condition of employment on the Research.

C-40. Executive Order N-6-22 — Russian Sanctions

On March 4, 2022, Governor Gavin Newsom issued Executive Order N-6-22 (the EO) regarding Economic Sanctions against Russia and Russian entities and individuals. "Economic Sanctions" refers to sanctions imposed by the U.S. government in response to Russia's actions in Ukraine, as well as any sanctions imposed under state law. The EO directs state agencies to terminate contracts with, and to refrain from entering any new contracts with, individuals or entities that are determined to be a target of Economic Sanctions. Accordingly, should the State Water Board determine Recipient is a target of Economic Sanctions or is conducting prohibited transactions with sanctioned individuals or entities, that shall be grounds for termination of this Agreement. The State Water Board shall provide Recipient advance written notice of such termination, allowing Recipient at least 30 calendar days to provide a written response. Termination shall be at the sole discretion of the State Water Board.

The Recipient represents that the Recipient is not a target of economic sanctions imposed in response to Russia's actions in Ukraine imposed by the United States government or the State of California. The Recipient is required to comply with the economic sanctions imposed in response to Russia's actions in Ukraine, including with respect to, but not limited to, the federal executive orders identified in California Executive Order N-6-22, located at <https://www.gov.ca.gov/wp-content/uploads/2022/03/3.4.22-Russia-Ukraine-Executive-Order.pdf> and the sanctions identified on the United States Department of the Treasury website (<https://home.treasury.gov/policy-issues/financial-sanctions/sanctions-programs-and-country-information/ukraine-russia-related-sanctions>). The Recipient is required to comply with all applicable reporting requirements regarding compliance with the economic sanctions, including, but not limited to, those reporting requirements set forth in California Executive Order N-6-22 for all Recipients with one or more agreements with the State of California with an aggregated value of Five Million Dollars (\$5,000,000) or more. Notwithstanding any other provision in this Agreement, failure to comply with the economic sanctions and all applicable reporting requirements may result in termination of this Agreement.

For Recipients with an aggregated agreement value of Five Million Dollars (\$5,000,000) or more with the State of California, reporting requirements include, but are not limited to, information related to steps taken in response to Russia's actions in Ukraine, including but not limited to:

- (a) Desisting from making any new investments or engaging in financial transactions with Russian institutions or companies that are headquartered or have their principal place of business in Russia;
- (b) Not transferring technology to Russia or companies that are headquartered or have their principal place of business in Russia; and
- (c) Direct support to the government and people of Ukraine.