





**Exhibit A**  
**SCOPE OF WORK**  
 PIR-13-009, Trevi Systems Inc.

**I. TASK AND ACRONYM/TERM LISTS**

**A. Task List**

Task #	CPR <sup>1</sup>	Task Name
1		Project Administration
2		Contract Execution
3		Design and Fabrication of a Forward Osmosis Containerized skid
4	x	Design and Fabrication of a Forward Osmosis Membrane Housing and Pre-Treatment Skid
5		Forward Osmosis and Membrane Software Development, and Long-term Field Testing of the Completed System
6		Evaluation of Project Benefits
7		Technology/Knowledge Transfer Activities/Readiness Plan

**B. Acronym/Term List**

Acronym/Term	Meaning
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CM	Contract Manufacturer
CPR	Critical Project Review
FO	Forward Osmosis
M&V	Measurement and Verification
M <sup>3</sup>	Cubic meters
MGD	Million Gallons per Day
RO	Reverse Osmosis
TAC	Technical Advisory Committee

**II. PURPOSE OF AGREEMENT, PROBLEM/SOLUTION STATEMENT, AND GOALS AND OBJECTIVES**

**A. Purpose of Agreement**

The purpose of this Agreement is to fund the design, development, and testing of a 100 cubic meter per day (100m<sup>3</sup>/day), forward osmosis (FO), large-scale pilot desalination plant. The FO process will be used to treat high salinity Reverse Osmosis (RO) brine from the project host site. The Recipient has successfully demonstrated a 1m<sup>3</sup>/day FO system for the U.S. Navy, and plans to scale up the technology for an industrial-scale demonstration at the project host site. After successful optimization of the pilot unit, a full-scale, 20 million gallon per day (MGD) plant may be constructed at the host site.

<sup>1</sup> Please see subtask 1.3 in Part III of the Scope of Work (Project Administration) for a description of Critical Project Review (CPR) Meetings.

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The FO system is a membrane process by which seawater may be desalinated and used for direct human consumption. The Recipient has developed a novel FO process that relies on a source of low-grade heat at a temperature of approximately 90 degrees Celsius to supply a large percentage of the system's energy requirements. Pilot testing of a 1m<sup>3</sup>/day FO system designed by the Recipient was performed at the U.S. Navy's Seawater Desalination Test Facility in Port Hueneme, California in February and March 2013. The purpose for this study was to demonstrate the electrical and thermal energy requirements of the Recipient's FO system based on pilot testing results, and to compare these energy requirements to those associated with conventional seawater desalination using an RO membrane process. Tests from this initial pilot testing revealed that FO has the capability to achieve an overall salt rejection of approximately 98.9 percent.

## **B. Problem/ Solution Statement**

### **Problem**

The project host site, an indirect potable re-use facility, has a need to recycle an additional 20MGD of municipal and industrial wastewater to meet the water demands of its 2.4 million customers. The host site currently discharges to the ocean approximately 25MGD of high salinity brine from an existing RO plant. None of this amount can be reclaimed and reused by its customers due to the high salinity (and therefore high energy cost) from the brine. In addition, the high fouling chemistry of the water scales the RO membranes and causes them to be less effective and efficient in purifying water, as solutes cannot pass through easily. The initial pilot testing of the FO system showed that fouling was caused by two primary factors: (1) The initial membrane used was designed for RO systems, not FO; and (2) No pH (acidity) of the FO feed stream was incorporated into the system. These issues are not expected to be problems in the future when membranes specific to FO applications are commercially available.

### **Solution**

The FO process uses waste heat as its energy source, dramatically lowering energy (electric and/or natural gas) consumption for desalination. The Recipient's system at the project host site will use waste heat, rather than natural gas or electricity, to increase the concentration of the brine stream (while producing potable water). This will reduce ocean discharge pumping costs in addition to increasing product yield. An additional benefit of FO is its much lower operating pressure on the membrane, resulting in lower rates of fouling. The pilot plant will return the product water and brine back to the sewer (after mixing and verification of water quality). Tasks will consist of: (1) designing and building a containerized, 100m<sup>3</sup>/day FO skid; (2) shipping to the site and installation; (3) calibration and pre-treatment adjustments; (4) ongoing monitoring of energy consumption, water production rate, and water quality; (5) determining fouling and maximum brine concentrations; and (6) monitoring draw solution.

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Funding of a 100m<sup>3</sup>/day pilot plant at the project host site will allow the Recipient to: (1) test the specific water chemistry and fouling properties of the host site's water on FO membranes; and (2) quantify and estimate the energy consumption, capital cost, and operating cost of a large-scale (20MGD) pilot plant. This will provide the project host site with the information needed to determine the technical and economic feasibility and operational issues associated with the FO plant.

### **C. Goals and Objectives of the Agreement**

#### **Agreement Goals**

The goals of this Agreement are to:

- Develop, install, and test a 100m<sup>3</sup>/day FO system at the project host site.
- Develop and install an FO membrane assembly that is fouling and scaling resistant, with low chemical consumption.
- Develop FO and pre-treatment skid software that will minimize energy consumption, maximize fouling resistance, and monitor produced water to ensure that potable water quality standards are maintained.
- Produce a set of operating conditions (in software) and a third party test plan that will reduce capital cost and energy consumption for the pilot plant.
- Validate the operating conditions using the test plan in an 12-month trial period in which all relevant parameters are measured, including energy consumption, chemical usage, fouling, and long term reliability.
- Develop an economic model for the host site that can accurately determine the capital, operating, energy, and maintenance costs of running a large-scale FO plant. This may be used by the host site to justify funding for a 20MGD FO facility.

The objectives of this Agreement are to:

- Measure the specific energy consumption of the FO process in therms/day and kWh/m<sup>3</sup> (and kWh/gallon) over a range of water recovery rates starting at 10% and increasing to 90%, and compare the results with existing RO technology.
- Determine the fouling performance of the FO membranes by monitoring the flux decline (as a percentage) in the membrane over a one-year period, using the software model developed and project membrane lifetime and cleaning regime to establish baseline maintenance procedures and costs (as a function of maintenance cost).
- Adjust the FO process parameters to re-optimize (iteratively) the membrane fouling parameters, chemical consumption, and energy consumption.
- Develop a plant design that may be implemented at wastewater facilities for salt remediation, and that quantifies specific energy consumption, maintenance requirements and costs, capital costs, and chemical consumption and costs.
- Validate that the resulting water quality after the FO process meets potable re-use standards determined by the project host site.

### III. TASK 1 PROJECT ADMINISTRATION

#### **PRODUCTS**

##### **Subtask 1.1 Products**

The goal of this subtask is to establish the requirements for submitting project products (e.g., reports, summaries, plans, and presentation materials). Unless otherwise specified by the Commission Agreement Manager (CAM), the Recipient must deliver products as required below by the dates listed in the **Project Schedule (Part V)**. Products that require a draft version are indicated by marking “**(draft and final)**” after the product name in the “Products” section of the task/subtask. If “(draft and final)” does not appear after the product name, only a final version of the product is required. With respect to due dates within this Scope of Work, “**days**” means working days.

##### **The Recipient shall:**

###### For products that require a draft version

- Submit all draft products to the CAM for review and comment in accordance with the Project Schedule (Part V). The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.
- Submit the final product to the CAM once agreement has been reached on the draft. The CAM will provide written approval of the final product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.
- If the CAM determines that the final product does not sufficiently incorporate his/her comments, submit the revised product to the CAM within 10 days of notice by the CAM, unless the CAM specifies a longer time period.

###### For products that require a final version only

- Submit the product to the CAM for approval.
- If the CAM determines that the product requires revision, submit the revised product to the CAM within 10 days of notice by the CAM, unless the CAM specifies a longer time period.

###### For all products

- Submit all data and documents required as products in accordance with the following Instructions for Submitting Electronic Files and Developing Software:
  - **Electronic File Format**  
Submit all data and documents required as products under this Agreement in an electronic file format that is fully editable and compatible with the Energy Commission’s software and Microsoft (MS)-operating computing platforms, or with any other format approved by the CAM. Deliver an

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electronic copy of the full text of any Agreement data and documents in a format specified by the CAM, such as memory stick or CD-ROM.

The following describes the accepted formats for electronic data and documents provided to the Energy Commission as products under this Agreement, and establishes the software versions that will be required to review and approve all software products:

- Data sets will be in MS Access or MS Excel file format (version 2007 or later), or any other format approved by the CAM.
- Text documents will be in MS Word file format, version 2007 or later.
- Documents intended for public distribution will be in PDF file format. The Recipient must also provide the native Microsoft file format.
- Project management documents will be in Microsoft Project file format, version 2007 or later.
  
- **Software Application Development**  
Use the following standard Application Architecture components in compatible versions for any software application development required by this Agreement (e.g., databases, models, modeling tools), unless the CAM approves other software applications such as open source programs:
  - Microsoft ASP.NET framework (version 3.5 and up). Recommend 4.0.
  - Microsoft Internet Information Services (IIS), (version 6 and up) Recommend 7.5.
  - Visual Studio.NET (version 2008 and up). Recommend 2010.
  - C# Programming Language with Presentation (UI), Business Object and Data Layers.
  - SQL (Structured Query Language).
  - Microsoft SQL Server 2008, Stored Procedures. Recommend 2008 R2.
  - Microsoft SQL Reporting Services. Recommend 2008 R2.
  - XML (external interfaces).

*Any exceptions to the Electronic File Format requirements above must be approved in writing by the CAM. The CAM will consult with the Energy Commission's Information Technology Services Branch to determine whether the exceptions are allowable.*

## **MEETINGS**

### **Subtask 1.2 Kick-off Meeting**

The goal of this subtask is to establish the lines of communication and procedures for implementing this Agreement.

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**The Recipient shall:**

- Attend a “Kick-off” meeting with the CAM, the Commission Agreement Officer (CAO), and any other Energy Commission staff relevant to the Agreement. The Recipient will bring its Project Manager and any other individuals designated by the CAM to this meeting. The administrative and technical aspects of the Agreement will be discussed at the meeting. Prior to the meeting, the CAM will provide an agenda to all potential meeting participants. The meeting may take place in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

The administrative portion of the meeting will include discussion of the following:

- Terms and conditions of the Agreement;
- Administrative products (subtask 1.1);
- CPR meetings (subtask 1.3);
- Match fund documentation (subtask 1.7);
- Permit documentation (subtask 1.8);
- Subcontracts (subtask 1.9); and
- Any other relevant topics.

The technical portion of the meeting will include discussion of the following:

- The CAM’s expectations for accomplishing tasks described in the Scope of Work;
  - An updated Project Schedule;
  - Technical products (subtask 1.1);
  - Progress reports and invoices (subtask 1.5);
  - Final Report (subtask 1.6);
  - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
  - Any other relevant topics.
- Provide an *Updated Project Schedule, List of Match Funds, and List of Permits*, as needed to reflect any changes in the documents.

**The CAM shall:**

- Designate the date and location of the meeting.
- Send the Recipient a *Kick-off Meeting Agenda*.

**Recipient Products:**

- Updated Project Schedule *(if applicable)*
- Updated List of Match Funds *(if applicable)*
- Updated List of Permits *(if applicable)*

**CAM Product:**

- Kick-off Meeting Agenda

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**Subtask 1.3 Critical Project Review (CPR) Meetings**

The goal of this subtask is to determine if the project should continue to receive Energy Commission funding, and if so whether any modifications must be made to the tasks, products, schedule, or budget. CPR meetings provide the opportunity for frank discussions between the Energy Commission and the Recipient. As determined by the CAM, discussions may include project status, challenges, successes, advisory group findings and recommendations, final report preparation, and progress on technical transfer and production readiness activities (if applicable). Participants will include the CAM and the Recipient, and may include the CAO and any other individuals selected by the CAM to provide support to the Energy Commission.

CPR meetings generally take place at key, predetermined points in the Agreement, as determined by the CAM and as shown in the Task List on page 1 of this Exhibit. However, the CAM may schedule additional CPR meetings as necessary. The budget will be reallocated to cover the additional costs borne by the Recipient, but the overall Agreement amount will not increase. CPR meetings generally take place at the Energy Commission, but they may take place at another location, or may be conducted via electronic conferencing (e.g., WebEx) as determined by the CAM.

**The Recipient shall:**

- Prepare a *CPR Report* for each CPR meeting that: (1) discusses the progress of the Agreement toward achieving its goals and objectives; and (2) includes recommendations and conclusions regarding continued work on the project.
- Submit the CPR Report along with any other *Task Products* that correspond to the technical task for which the CPR meeting is required (i.e., if a CPR meeting is required for Task 2, submit the Task 2 products along with the CPR Report).
- Attend the CPR meeting.
- Present the CPR Report and any other required information at each CPR meeting.

**The CAM shall:**

- Determine the location, date, and time of each CPR meeting with the Recipient's input.
- Send the Recipient a *CPR Agenda* and a *List of Expected CPR Participants* in advance of the CPR meeting. If applicable, the agenda will include a discussion of match funding and permits.
- Conduct and make a record of each CPR meeting. Provide the Recipient with a *Schedule for Providing a Progress Determination* on continuation of the project.
- Determine whether to continue the project, and if so whether modifications are needed to the tasks, schedule, products, or budget for the remainder of the Agreement. If the CAM concludes that satisfactory progress is not being made, this conclusion will be referred to the Deputy Director of the Energy Research and Development Division.

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- Provide the Recipient with a *Progress Determination* on continuation of the project, in accordance with the schedule. The Progress Determination may include a requirement that the Recipient revise one or more products.

**Recipient Products:**

- CPR Report(s)
- Task Products (draft and/or final as specified in the task)

**CAM Products:**

- CPR Agenda
- List of Expected CPR Participants
- Schedule for Providing a Progress Determination
- Progress Determination

**Subtask 1.4 Final Meeting**

The goal of this subtask is to complete the closeout of this Agreement.

**The Recipient shall:**

- Meet with Energy Commission staff to present project findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement. This meeting will be attended by the Recipient and CAM, at a minimum. The meeting may occur in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be divided into two separate meetings at the CAM's discretion.

- The technical portion of the meeting will involve the presentation of findings, conclusions, and recommended next steps (if any) for the Agreement. The CAM will determine the appropriate meeting participants.
- The administrative portion of the meeting will involve a discussion with the CAM and the CAO of the following Agreement closeout items:
  - Disposition of any state-owned equipment.
  - Need to file a Uniform Commercial Code Financing Statement (Form UCC-1) regarding the Energy Commission's interest in patented technology.
  - The Energy Commission's request for specific "generated" data (not already provided in Agreement products).
  - Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.
  - "Surviving" Agreement provisions such as repayment provisions and confidential products.
  - Final invoicing and release of retention.

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- Prepare a *Final Meeting Agreement Summary* that documents any agreement made between the Recipient and Commission staff during the meeting.
- Prepare a *Schedule for Completing Agreement Closeout Activities*.
- Provide *All Draft and Final Written Products* on a CD-ROM or USB memory stick, organized by the tasks in the Agreement.

**Products:**

- Final Meeting Agreement Summary (*if applicable*)
- Schedule for Completing Agreement Closeout Activities
- All Draft and Final Written Products

## **REPORTS AND INVOICES**

### **Subtask 1.5 Progress Reports and Invoices**

The goals of this subtask are to: (1) periodically verify that satisfactory and continued progress is made towards achieving the research objectives of this Agreement; and (2) ensure that invoices contain all required information and are submitted in the appropriate format.

**The Recipient shall:**

- Submit a monthly *Progress Report* to the CAM. Each progress report must:
  - Summarize all Agreement activities conducted by the Recipient for the preceding month, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. See the Progress Report Format Attachment for the recommended specifications.
  - Provide a synopsis of the project progress, including accomplishments, problems, milestones, products, schedule, fiscal status, and any evidence of progress such as photographs.
- Submit a monthly or quarterly *Invoice* that follows the instructions in the terms and conditions. In addition, each invoice must document and verify:
  - Energy Commission funds received by California-based entities;
  - Energy Commission funds spent in California (*if applicable*); and
  - Match fund expenditures.

**Products:**

- Progress Reports
- Invoices

### **Subtask 1.6 Final Report**

The goal of this subtask is to prepare a comprehensive Final Report that describes the original purpose, approach, results, and conclusions of the work performed under this

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Agreement. The CAM will review and approve the Final Report, which will be due at least **two months** before the Agreement end date. When creating the Final Report Outline and the Final Report, the Recipient must use a Style Manual provided by the CAM.

### **Subtask 1.6.1 Final Report Outline**

**The Recipient shall:**

- Prepare a *Final Report Outline* in accordance with the *Style Manual* provided by the CAM.
- Submit a draft of the outline to the CAM for review and comment.
- Once agreement has been reached on the draft, submit the final outline to the CAM. The CAM will provide written approval of the final outline within 10 days of receipt.

**Recipient Products:**

- Final Report Outline (draft and final)

**CAM Product:**

- Style Manual

### **Subtask 1.6.2 Final Report**

**The Recipient shall:**

- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline and the Style Manual provided by the CAM.
- Submit a draft of the report to the CAM for review and comment. Once agreement on the draft report has been reached, the CAM will forward the electronic version for Energy Commission internal approval. Once the CAM receives approval, he/she will provide written approval to the Recipient.
- Submit one bound copy of the Final Report to the CAM.

**Products:**

- Final Report (draft and final)

## **MATCH FUNDS, PERMITS, AND SUBCONTRACTS**

### **Subtask 1.7 Match Funds**

The goal of this subtask is to ensure that the Recipient obtains any match funds planned for this Agreement and applies them to the Agreement during the Agreement term.

While the costs to obtain and document match funds are not reimbursable under this Agreement, the Recipient may spend match funds for this task. The Recipient may only

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spend match funds during the Agreement term, either concurrently or prior to the use of Energy Commission funds. Match funds must be identified in writing, and the Recipient must obtain any associated commitments before incurring any costs for which the Recipient will request reimbursement.

**The Recipient shall:**

- Prepare a *Match Funds Status Letter* that documents the match funds committed to this Agreement. If no match funds were part of the proposal that led to the Energy Commission awarding this Agreement and none have been identified at the time this Agreement starts, then state this in the letter.

If match funds were a part of the proposal that led to the Energy Commission awarding this Agreement, then provide in the letter:

- A list of the match funds that identifies:
  - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
  - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
- A copy of a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.
- At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide a *Supplemental Match Funds Notification Letter* to the CAM of receipt of additional match funds.
- Provide a *Match Funds Reduction Notification Letter* to the CAM if existing match funds are reduced during the course of the Agreement. Reduction of match funds may trigger a CPR meeting.

**Products:**

- Match Funds Status Letter
- Supplemental Match Funds Notification Letter *(if applicable)*
- Match Funds Reduction Notification Letter *(if applicable)*

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**Subtask 1.8 Permits**

The goal of this subtask is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track. Permit costs and the expenses associated with obtaining permits are reimbursable under this Agreement. Permits must be identified and obtained before the Recipient may incur any costs related to the use of the permit(s) for which the Recipient will request reimbursement.

**The Recipient shall:**

- Prepare a *Permit Status Letter* that documents the permits required to conduct this Agreement. If no permits are required at the start of this Agreement, then state this in the letter. If permits will be required during the course of the Agreement, provide in the letter:
  - A list of the permits that identifies: (1) the type of permit; and (2) the name, address, and telephone number of the permitting jurisdictions or lead agencies.
  - The schedule the Recipient will follow in applying for and obtaining the permits.

The list of permits and the schedule for obtaining them will be discussed at the Kick-off meeting (subtask 1.2), and a timetable for submitting the updated list, schedule, and copies of the permits will be developed. The impact on the project if the permits are not obtained in a timely fashion or are denied will also be discussed. If applicable, permits will be included as a line item in progress reports and will be a topic at CPR meetings.

- If during the course of the Agreement additional permits become necessary, then provide the CAM with an *Updated List of Permits* (including the appropriate information on each permit) and an *Updated Schedule for Acquiring Permits*.
- Send the CAM a *Copy of Each Approved Permit*.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CAM within 5 days. Either of these events may trigger a CPR meeting.

**Products:**

- Permit Status Letter
- Updated List of Permits (*if applicable*)
- Updated Schedule for Acquiring Permits (*if applicable*)
- Copy of each Approved Permit (*if applicable*)

**Subtask 1.9 Subcontracts**

The goals of this subtask are to: (1) procure subcontracts required to carry out the tasks under this Agreement; and (2) ensure that the subcontracts are consistent with the terms and conditions of this Agreement.

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**The Recipient shall:**

- Manage and coordinate subcontractor activities in accordance with the requirements of this Agreement.
- Incorporate this Agreement by reference into each subcontract.
- Include any required Energy Commission flow-down provisions in each subcontract, in addition to a statement that the terms of this Agreement will prevail if they conflict with the subcontract terms.
- If required by the CAM, submit a draft of each *Subcontract* required to conduct the work under this Agreement.
- Submit a final copy of the executed subcontract.
- Notify and receive written approval from the CAM prior to adding any new subcontractors (see the discussion of subcontractor additions in the terms and conditions).

**Products:**

- Subcontracts (*draft if required by the CAM*)

**TECHNICAL ADVISORY COMMITTEE**

**Subtask 1.10 Technical Advisory Committee (TAC)**

The goal of this subtask is to create an advisory committee for this Agreement. The TAC should be composed of diverse professionals. The composition will vary depending on interest, availability, and need. TAC members will serve at the CAM's discretion. The purpose of the TAC is to:

- Provide guidance in research direction. The guidance may include research scope and methodologies, timing, and coordination with other research. The guidance may be based on:
  - Technical area expertise;
  - Knowledge of market applications; or
  - Linkages between the agreement work and other past, present, or future research (both public and private sectors) that TAC members are aware of in a particular area.
- Review products and provide recommendations for needed product adjustments, refinements, or enhancements.
- Evaluate the tangible benefits of project research to the state of California, and provide recommendations as needed to enhance the benefits.
- Provide recommendations regarding information dissemination, market pathways, or commercialization strategies relevant to the research products.

The TAC may be composed of qualified professionals spanning the following types of disciplines:

- Researchers knowledgeable about the project subject matter;

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- Members of trades that will apply the results of the project (e.g., designers, engineers, architects, contractors, and trade representatives);
- Public interest market transformation implementers;
- Product developers relevant to the project;
- U.S. Department of Energy research managers, or experts from other federal or state agencies relevant to the project;
- Public interest environmental groups;
- Utility representatives;
- Air district staff; and
- Members of relevant technical society committees.

**The Recipient shall:**

- Prepare a *List of Potential TAC Members* that includes the names, companies, physical and electronic addresses, and phone numbers of potential members. The list will be discussed at the Kick-off meeting, and a schedule for recruiting members and holding the first TAC meeting will be developed.
- Recruit TAC members. Ensure that each individual understands member obligations and the TAC meeting schedule developed in subtask 1.11.
- Prepare a *List of TAC Members* once all TAC members have committed to serving on the TAC.
- Submit *Documentation of TAC Member Commitment* (such as Letters of Acceptance) from each TAC member.

**Products:**

- List of Potential TAC Members
- List of TAC Members
- Documentation of TAC Member Commitment

**Subtask 1.11 TAC Meetings**

The goal of this subtask is for the TAC to provide strategic guidance for the project by participating in regular meetings, which may be held via teleconference.

**The Recipient shall:**

- Discuss the TAC meeting schedule with the CAM at the Kick-off meeting. Determine the number and location of meetings (in-person and via teleconference) in consultation with the CAM.
- Prepare a *TAC Meeting Schedule* that will be presented to the TAC members during recruiting. Revise the schedule after the first TAC meeting to incorporate meeting comments.
- Prepare a *TAC Meeting Agenda* and *TAC Meeting Back-up Materials* for each TAC meeting.
- Organize and lead TAC meetings in accordance with the TAC Meeting Schedule. Changes to the schedule must be pre-approved in writing by the CAM.

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- Prepare *TAC Meeting Summaries* that include any recommended resolutions of major TAC issues.

**Products:**

- TAC Meeting Schedule (draft and final)
- TAC Meeting Agendas (draft and final)
- TAC Meeting Back-up Materials
- TAC Meeting Summaries

**TECHNICAL TASKS**

**Task 2 Contract Execution**

The goals of this task are to: (1) confirm the availability of the project demonstration site and a measurement and verification (M&V) contractor; and (2) execute any agreements necessary to secure the demonstration site and M&V contractor.

**Subtask 2.1 Execute a Contract with the Selected Demonstration Site**

**The Recipient shall:**

- Reach agreement with the manager(s) of the selected demonstration site regarding the project timeline, space reserved for the project, equipment installation, permit and insurance requirements, indemnity, and the Recipient's use of any support staff
- If the selected demonstration site becomes unavailable during the project term, work with the CAM to select a new site suitable for the project
- Execute a *Contract with the Demonstration Site* that secures the site and formalizes the agreed-upon timeline, space reserved for the project, equipment installation, permit and insurance requirements, indemnity, and the Recipient's use of any support staff

**Products:**

- Contract with the Demonstration Site

**Subtask 2.2 Execute a Contract with the Selected M&V Contractor**

**The Recipient shall:** Confirm the selected M&V contractor's ability to provide required hardware, software, and staff to conduct the required measurements during the project term

- Confirm that the selected M&V contractor will follow utility M&V protocols, and will prepare a detailed analytical report that verifies energy consumption and engineering calculations for energy and cost savings
- Work with the CAM to select a new M&V contractor if the selected M&V contractor becomes unavailable during the project term

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- Execute a *Contract with the M&V Contractor* that secures the contractor's services during the project term and confirms that the contractor will follow M&V protocol and prepare the detailed analytical report
- Confirm that the selected M&V contractor will follow utility M&V protocols, and will prepare a detailed analytical report that verifies energy consumption and engineering calculations for energy and cost savings
- Work with the CAM to select a new M&V contractor if the selected M&V contractor becomes unavailable during the project term
- Execute a *Contract with the M&V Contractor* that secures the contractor's services during the project term and confirms that the contractor will follow M&V protocol and prepare the detailed analytical report

Confirm the selected M&V contractor's ability to provide required hardware, software, and staff to conduct the required measurements during the project term

- Confirm that the selected M&V contractor will follow utility M&V protocols, and will prepare a detailed analytical report that verifies energy consumption and engineering calculations for energy and cost savings
- Work with the CAM to select a new M&V contractor if the selected M&V contractor becomes unavailable during the project term
- Execute a *Contract with the M&V Contractor* that secures the contractor's services during the project term and confirms that the contractor will follow M&V protocol and prepare the detailed analytical report

Confirm the selected M&V contractor's ability to provide required hardware, software, and staff to conduct the required measurements during the project term

- Confirm that the selected M&V contractor will follow utility M&V protocols, and will prepare a detailed analytical report that verifies energy consumption and engineering calculations for energy and cost savings
- Work with the CAM to select a new M&V contractor if the selected M&V contractor becomes unavailable during the project term
- Execute a *Contract with the M&V Contractor* that secures the contractor's services during the project term and confirms that the contractor will follow M&V protocol and prepare the detailed analytical report

**Products:**

- Contract with the M&V Contractor

**TASK 3 Design and Fabrication of a Forward Osmosis (FO) Containerized Skid**

The goal of this task is to design the chemical (draw solution), mechanical, and electrical elements of a large-scale pilot 100m<sup>3</sup>/day forward osmosis thermal skid, including skid assembly in a container for shipment to the project host site.

**Subtask 3.1 Requirements Definition**

**Exhibit A**  
**SCOPE OF WORK**  
PIR-13-009, Trevi Systems Inc.

The goal of this subtask is to define FO system requirements, regulatory assessments, and costs.

**The Recipient shall:**

- Define system requirements for the project host site, including specification of the waste heat source, temperature, and connection at the test site
- Conduct initial regulatory assessments
- Conduct a preliminary cost analysis, including an investigation and modeling of the costs to the project host site for electric, natural gas, or solar options
- Prepare an *FO System Requirements Report* that includes the following:
  - Defined FO system requirements for the project host site, including waste heat source, temperature, and connection at the test site
  - Results of initial regulatory assessments
  - Preliminary cost analysis, including an investigation and modeling of the costs to the project host site for electric, natural gas, or solar options results

**Products:**

- FO System Requirements Report

**Subtask 3.2 Design Specifications for 100m<sup>3</sup>/day FO System**

The goal of this subtask is to develop specific FO system design parameters, including definition of the chemical draw solution, thermal heat sources, flow diagram, controls, software, and mechanical specifications.

**The Recipient shall:**

- Define the draw solution and quantity to be used for the system, and determine draw solution procurement steps
- Determine source of the process heat to be used by the system
- Develop process flow diagrams, a piping and instrumentation diagram, and a unit operation data sheet publication
- Develop all required mechanical specifications (e.g., heat exchanger and coalescer) for the FO system
- Develop all electrical and controls specifications for the FO system
- Develop a complete FO system software specification (e.g., startup procedure, control loops, and steady state and alarm conditions)
- Prepare an *FO System Design Specification Report* that includes the following:
  - Draw solution, quantity to be used, and procurement sources and steps
  - Detailed listing of sources of process heat
  - Copies of the process flow diagrams, piping and instrumentation diagram, and unit operation data sheet publication
  - Unit operation data sheet
  - Mechanical specifications
  - Electrical and controls specifications

**Exhibit A**  
**SCOPE OF WORK**  
PIR-13-009, Trevi Systems Inc.

- FO software specification (including system software specification)

**Product:**

- FO System Design Specification Report

**Subtask 3.3 100m<sup>3</sup>/day FO System Design**

The goal of this subtask is to define specific system design elements for the FO system.

**The Recipient shall:**

- Define system startup, operation monitoring, and control procedures
- Define a nanofilter design
- Select appropriate pumps
- Design and select heat exchangers
- Design a heater system
- Design and properly size a coalescer system
- Design a surge tank
- Design system controls
- Design system instrumentation
- Design system integration methods/procedures
- Design the system layout and structure of the container
- Develop a System Maintenance and Cleaning Plan
- Ensure that the system design meets regulatory requirements
- Develop a design for system safety
- Conduct a preliminary design review
- Develop a schematic and construction drawing package
- Review the detailed design
- Finalize the design, drawings, and software of the FO system
- Generate a bill of materials
- Conduct a detailed design gate review
- Define and provide justification for the approved vendor list/component selection
- Update capital and operation/maintenance cost analysis for the FO system
- Develop a Validation/Monitoring and Verification Plan
- Develop operating instructions and maintenance procedures
- Prepare an *FO System Design Report* that includes but is not be limited to a detailed discussion of all items listed above

**Products:**

- FO System Design Report

**Subtask 3.4 Host site FO System Procurement & Manufacturing**

The goal of this subtask is to identify Contract Manufacturers (CMs), determine costs, create models (capital cost of full-scale system), and develop a plan to build an FO system at the project host site.

**Exhibit A**  
**SCOPE OF WORK**  
PIR-13-009, Trevi Systems Inc.

**The Recipient shall:**

- Identify prospective CMs
- Develop and obtain a CM quote package
- Obtain CM Quotes and make a selection
- Develop a capital expenditure scaling model
- Develop a Manufacturing Build Plan & Schedule
- Prepare a *System Procurement and Manufacturing Report* that includes all of the information identified above, including:
  - Prospective CMs
  - Copies of CM quotes, selection process, and winning bid
  - Copy of capital expenditure scaling model and results of applications
  - Discussion of the Manufacturing Build Plan and Schedule

**Products:**

- System Procurement and Manufacturing Report

**Subtask 3.5 Purchase Long Lead Time Items**

The goal of this subtask is to purchase components for construction of a 100m<sup>3</sup>/day FO system at the project host site.

**The Recipient shall:**

- Identify and purchase FO system components (hardware and software) that require long lead time for delivery. At a minimum, the following items will be designed and/or specified for purchase in accordance with the Manufacturing Build Plan and Schedule created in Subtask 3.4:
  - Pumps
  - Heat Exchangers
  - Draw Solution for 100m<sup>3</sup>/day FO System
  - IR Sensors
  - Containers
  - Heater
  - Coalescer
- Include a purchase schedule and updates on delivery status in monthly progress reports

**Products:**

- Purchase schedule and updates on delivery status (to be included in monthly progress reports)

**Subtask 3.6 Purchase Remaining FO System Items**

The goal of this subtask is to purchase remaining items for construction of the 100m<sup>3</sup>/day FO system.

**Exhibit A**  
**SCOPE OF WORK**  
PIR-13-009, Trevi Systems Inc.

**The Recipient shall:**

- Purchase nanofilters, controls equipment, and plumbing piping and fittings
- Purchase custom components and supply them to the CM
- Include a purchase schedule and updates on delivery status in monthly progress reports.

**Product:**

- Purchase schedule and updates on delivery status (to be included in monthly progress reports).

**Subtask 3.7 Build and Qualify FO System**

The goal of this subtask is to build and test the FO system at the CM's facility prior to deployment at the project host site.

**The Recipient shall:**

- Build/assemble the FO system at the CM's facility
- Identify functional and safety/regulatory tests to be performed on the FO system
- Conduct an initial functional test of the FO system at the CM's facility
- Conduct safety/regulatory testing of the FO System
- Finalize regulatory submissions
- Prepare an *Initial Assembly and Testing Report* that includes but is not be limited to a detailed discussion of the items listed above, including:
  - Documented proof of the initial assembly of the FO system
  - Description of the functional and safety/regulatory tests to be performed on the FO system
  - Results of functional and safety/regulatory tests and identification of outstanding issues
  - Copies of regulatory submissions

**Product:**

- Initial Assembly and Testing Report

**Subtask 3.8 Deployment of FO System at the Project Host site**

The goal of this subtask is to successfully deploy the 100m<sup>3</sup>/day FO system at the project host site.

**The Recipient shall:**

- Obtain any remaining permits
- Work with the project host site staff and M&V contractor to prepare the site for system installation
- Determine water intake and outflow requirements
- Prepare a *Site Preparation Report* that includes the following:
  - Status of permits and copies of all approved permits
  - Certification that the host site has prepared for the FO system installation

**Exhibit A**  
**SCOPE OF WORK**  
PIR-13-009, Trevi Systems Inc.

- Determination of water intake and outflows
- Transport and deploy the 100m<sup>3</sup>/day FO containerized skid system to the project site, including taking all steps to package, insure, ship, unload, inspect, and store all parts of the 100m<sup>3</sup>/day FO skid system.
- Perform any necessary site-specific preparation work for deployment
- Fully Install the 100m<sup>3</sup>/day FO system at the project host site
- Conduct system startup and shakedown testing to commission the FO System for operation
- Develop and write an *FO System Operations Manual* for training of project host site employees that includes the following:
  - All materials to train host site employees for optimized operation
  - Scheduled maintenance
  - List of FO System components, including part numbers
  - Final copy of the “as built” FO System Design specification
- Conduct training sessions for host site staff on FO system use
- Obtain an *FO System Acceptance Letter* from the host site that confirms that a fully assembled, installed, and operational FO skid was delivered to the host site and that the system meets the site’s requirements.

**Product:**

- Site Preparation Report
- FO System Operations Manual
- FO System Acceptance Letter

**Subtask 3.9 Water/Effluent Quality and Initial FO System Performance**

The goals of this subtask are to determine water regulatory and brine disposal requirements, conduct initial testing of the FO system, and measure system performance.

**The Recipient shall:**

- Determine local water quality requirements regarding reuse of water resulting from the FO process
- Identify federal, state, and local regulations regarding brine discharge
- Perform initial testing, operation, and monitoring of the FO system
- Work with the project M&V contractor to prepare an *Initial Operations and Monitoring Report* that includes but is not limited to the following:
  - Water quality requirements
  - federal, state, and local regulations
  - Brine disposal requirements
  - Discussion of initial system operations
  - Discussion of initial monitoring results

**Product:**

- Initial Operations and Monitoring Report

**Exhibit A**  
**SCOPE OF WORK**  
PIR-13-009, Trevi Systems Inc.

**Task 4. Design and Fabrication of a Forward Osmosis Membrane Housing and Pre-Treatment Skid**

**Subtask 4.1 Host Site Membrane System**

The goals of this subtask are to determine FO membrane requirements, select a membrane manufacturer, and manufacture the membrane for the 100m<sup>3</sup>/day FO system.

**The Recipient shall:**

- Determine performance requirements for the FO membrane
- Select a membrane manufacturer and determine the manufacturing process
- Manufacture hollow fiber membranes for the FO system
- Develop an acceptance testing methodology to ensure that manufactured membranes meet FO system performance requirements
- Conduct acceptance testing of the hollow fiber membranes to be used in the FO system
- Prepare a *Membrane Status Report* that includes but is not limited to the following:
  - Discussion of FO membrane performance requirements
  - Identification of the membrane manufacturer and the membrane manufacturing process for hollow fiber membranes
  - Discussion of the acceptance testing methodology to ensure that membranes meet FO system performance requirements
  - Results of acceptance testing of the hollow fiber membranes
  - Discussion of barriers and solutions

**Product:**

- Membrane Status Report

**Subtask 4.2 Package Membranes**

The goal of this subtask is final design of the membrane housing and assembly of the membrane and pre-treatment skid.

**The Recipient shall:**

- Design and construct tubular packaging
- Manufacture membrane cassette packaging
- Develop a vibration mechanism design and attachment
- Develop a seeding mechanism design and installation
- Design and fabricate an integrated housing assembly
- Determine the pre-treatment chemical composition selection
- Develop a membrane/pre-treatment skid design
- Develop a CM Quote Package
- Obtain CM quotes and select a CM

**Exhibit A**  
**SCOPE OF WORK**  
PIR-13-009, Trevi Systems Inc.

- Develop a manufacturing build plan and schedule
- Develop a capital expenditure scaling model
- Assemble and test a membrane/pre-treatment skid
- Ship the packaged membrane housing and pre-treatment skid to the project host site, and install the skid at the site
- Perform startup activities at the host site
- Prepare a *Membrane Housing and Pre-Treatment System Operations Manual* that contains training materials for host site employees on how to operate and maintain the system
- Run, monitor, test, optimize process of membrane in FO system
- Prepare a *Membrane Housing and Pre-Treatment System Report* that includes but is not limited to a discussion of the following:
  - Tubular packaging design and construction
  - Membrane cassette packaging manufacturing
  - Vibration mechanism design and attachment development
  - Seeding mechanism design and installation
  - Integrated housing assembly (for membrane) design and fabrication
  - Pre-treatment chemical composition selection
  - Membrane/pre-treatment skid design development
  - Cost quotes determined from the CM, including a building plan
  - Capital expenditure scaling model development
  - Membrane/pre-treatment skid assembly and testing at the CM site
  - Membrane/pre-treatment skid shipment to the project host site
  - Membrane/pre-treatment skid installation at the project host site
  - Membrane/pre-treatment skid startup, monitoring, testing, and optimization of the membrane in FO system at the host site
  - Training of the project host site employees (all training materials in an appendix)
- Submit a *System Acceptance Letter* from the project host site that confirms that the fully assembled, installed, and operational FO system with membrane and pre-treatment skids was delivered to the host site, that the system is operational, and that it meets agreed upon expectations and/or requirements (100m<sup>3</sup>/day capacity).
- Participate in a Critical Project Review, per subtask 1.3

**Product:**

- Membrane Housing and Pre-Treatment System Operations Manual
- Membrane Housing and Pre-Treatment System Report
- System Acceptance Letter

**TASK 5 Forward Osmosis and Membrane Software Development, and Long-Term Field Testing of the Completed System**

**Exhibit A**  
**SCOPE OF WORK**  
PIR-13-009, Trevi Systems Inc.

**Subtask 5.1 Controls Software to Adjust Amplitude and Frequency of Membrane Vibration**

The goals of this subtask are to develop system software to minimize energy consumption by the FO skid, and to develop membrane software to maximize the fouling resistance of the FO membrane and pre-treatment.

**The Recipient shall:**

- Develop *Software for the Tube Design*
- Develop *Software for the Membrane Cassette Design* that minimizes fouling of the FO membrane
- Prepare a *Software Test Plan* for evaluating software that discusses the ability of the developed software programs to design FO systems that minimize energy consumption and FO membranes that are fouling resistant
- Complete a *Mid-Term Benefits Questionnaire*

**Products:**

- Software for the Tube Design
- Software for the Membrane Cassette Design
- Software Test Plan
- Mid-Term Benefits Questionnaire

**Subtask 5.2 Run Various System Conditions and Set Points**

The goal of this subtask is to determine initial system operations and parameters.

**The Recipient shall:**

- Determine frequency set points, amplitude set points, chemical dosing methods and levels, and seeding methods and levels
- Prepare a *System Conditions and Set Points Report* that includes but is not limited to a discussion of the frequency set points, amplitude set points, chemical dosing methods and levels, and seeding methods and levels.

**Products:**

- System Conditions and Set Points Report

**Subtask 5.3 Long-Term Field Testing and Reporting of Results**

The goal of this subtask is to work with the project M&V contractor to conduct long-term monitoring and evaluation of the system at the project host site. Activities include the collection, analysis, and interpretation of data with select parameter variations (e.g., set points and operating methods) on scaling performance, membrane performance, water production rate, water quality, overall system energy use, waste-heat recovery, energy savings, chemical use, and other key metrics as identified by the host site (and other project partners).

**Exhibit A**  
**SCOPE OF WORK**  
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**The Recipient shall:**

- Use software (from subtask 5.1) to monitor brine composition, permeate quality, and membrane flux
- Work with the M&V contractor to conduct an initial energy, performance, and economic analysis from at least four months of collected data
- Prepare an *Initial M&V Report* from software results and the M&V contractor's assessment of system performance (e.g., energy and chemical use, water production and quality, and reliability)
- Make necessary adjustments and refinements to permeate yield (%), chemical addition quantity (gallons), and energy consumption (electricity and natural gas use) of the FO and membrane skid
- Observe and document the long-term (at least 12 months or other duration with CAM approval) reliability of selected software operating conditions
  - Adjust recovery rate and monitor fouling frequency
  - Adjust frequency of backflush and switching of membranes
  - Adjust operating temperature based on incoming salinity
  - Control heat exchangers for waste heat recovery
  - Regulate system operating pressure for maximum recovery
  - Recycle rates of the draw solution
- Work with the project M&V contractor to:
  - Prepare a *Field Test Report* that delineates the approach used to achieve project goals
  - Prepare a Capital Expenditure, Operating Expenditure, and Operations and Maintenance Report for the project host site that includes the cost to the ratepayer base for increasing brine recovery, the cost of doing so from 10% to 90% recovery, and the ability to meet all discharge permit conditions.
  - Write a *Final M&V Report* that uses at least 12 months of collected data or other durations, with CAM approval

**Product:**

- Initial M&V Report
- Field Test Report
- Final M&V Report

**TASK 6 Evaluation of Project Benefits**

The goal of this task is to report the benefits resulting from this project.

**The Recipient shall:**

- Complete three Project Benefits Questionnaires that correspond to three main intervals in the Agreement: (1) *Kick-off Meeting Benefits Questionnaire*; (2) *Mid-term Benefits Questionnaire*; and (3) *Final Meeting Benefits Questionnaire*.
- Provide all key assumptions used to estimate projected benefits, including targeted market sector (e.g., population and geographic location), projected

**Exhibit A**  
**SCOPE OF WORK**  
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market penetration, baseline and projected energy use and cost, operating conditions, and emission reduction calculations. Examples of information that may be requested in the questionnaires include:

- For Product Development Projects and Project Demonstrations:
  - Published documents, including date, title, and periodical name.
  - Estimated or actual energy and cost savings, and estimated statewide energy savings once market potential has been realized. Identify all assumptions used in the estimates.
  - Greenhouse gas and criteria emissions reductions.
  - Other non-energy benefits such as reliability, public safety, lower operational cost, environmental improvement, indoor environmental quality, and societal benefits.
  - Data on potential job creation, market potential, economic development, and increased state revenue as a result of the project.
  - A discussion of research product downloads from websites, and publications in technical journals.
  - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
  - Additional Information for Product Development Projects:
    - Outcome of product development efforts, such copyrights and license agreements.
    - Units sold or projected to be sold in California and outside of California.
    - Total annual sales or projected annual sales (in dollars) of products developed under the Agreement.
    - Investment dollars/follow-on private funding as a result of Energy Commission funding.
    - Patent numbers and applications, along with dates and brief descriptions.
  - Additional Information for Product Demonstrations:
    - Outcome of demonstrations and status of technology.
    - Number of similar installations.
    - Jobs created/retained as a result of the Agreement.
- For Information/Tools and Other Research Studies:
  - Outcome of research.
  - Published documents, including date, title, and periodical name.
  - A discussion of policy development. State if the research has been cited in government policy publications or technical journals, or has been used to inform regulatory bodies.
  - The number of website downloads.

**Exhibit A**  
**SCOPE OF WORK**  
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- An estimate of how the information and research have affected energy use and cost, or have resulted in other non-energy benefits.
- An estimate of energy and non-energy benefits.
- Data on potential job creation, market potential, economic development, and increased state revenue as a result of research.
- A discussion of research product downloads from websites, and publications in technical journals.
- A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
- Respond to CAM questions regarding responses to the questionnaires.

*The Energy Commission may send the Recipient similar questionnaires after the Agreement term ends. Responses to these questionnaires will be voluntary.*

**Products:**

- Kick-off Meeting Benefits Questionnaire
- Final Meeting Benefits Questionnaire

**TASK 7 Technology/Knowledge Transfer Activities/Readiness Plan**

**Subtask 7.1 Technology Transfer Plan**

The goal of this task is to develop a plan to make the knowledge gained, experimental results, and lessons learned available to the public and key decision makers.

**The Recipient shall:**

- Prepare an *Initial Fact Sheet* at start of the project that describes the project research. Use the format provided by the CAM.
- Prepare a *Final Project Fact Sheet* at the project's conclusion that discusses research results. Use the format provided by the CAM.
- Prepare a *Technology/Knowledge Transfer Plan* that includes:
  - An explanation of how the knowledge gained from the project will be made available to the public, including the targeted market sector and potential outreach to end users, utilities, regulatory agencies, and others.
  - A description of the intended use(s) for and users of the project results.
  - Published documents, including date, title, and periodical name.
  - Copies of documents, fact sheets, journal articles, press releases, and other documents prepared for public dissemination. These documents must include the Legal Notice required in the terms and conditions. Indicate where and when the documents were disseminated.
  - A discussion of policy development. State if research has been or will be cited in government policy publications, or used to inform regulatory bodies.
  - The number of website downloads or public requests for research results.

**Exhibit A**  
**SCOPE OF WORK**  
PIR-13-009, Trevi Systems Inc.

- Additional areas as determined by the CAM.
- Conduct technology transfer activities in accordance with the Technology/Knowledge Transfer Plan. These activities will be reported in the Progress Reports.
- Prepare a *Technology/Knowledge Transfer Report* on technology transfer activities conducted during the project.

**Products:**

- Initial Fact Sheet (draft and final)
- Final Project Fact Sheet (draft and final)
- Technology/Knowledge Transfer Plan (draft and final)
- Technology/Knowledge Transfer Report (draft and final)

**Subtask 7.2 Production Readiness Plan**

The goal of this task is to determine the steps that will lead to the manufacturing of technologies developed in this project or to the commercialization of the project's results.

**The Recipient shall:**

- Prepare a *Production Readiness Plan*. The degree of detail in the plan should be proportional to the complexity of producing or commercializing the proposed product, and to its state of development. As appropriate, the plan will discuss the following:
  - Critical production processes, equipment, facilities, personnel resources, and support systems needed to produce a commercially viable product.
  - Internal manufacturing facilities, supplier technologies, capacity constraints imposed by the design under consideration, design-critical elements, and the use of hazardous or non-recyclable materials. The product manufacturing effort may include "proof of production processes."
  - The estimated cost of production.
  - The expected investment threshold needed to launch the commercial product.
  - An implementation plan to ramp up to full production.
  - The outcome of product development efforts, such as copyrights and license agreements.
  - Patent numbers and applications, along with dates and brief descriptions.
  - Other areas as determined by the CAM.

**Products:**

- Production Readiness Plan (draft and final)

**IV. PROJECT SCHEDULE**

Please see the attached Excel spreadsheet.

**RESOLUTION NO:**

**STATE OF CALIFORNIA**

**STATE ENERGY RESOURCES  
CONSERVATION AND DEVELOPMENT COMMISSION**

RESOLUTION - RE: TREVI SYSTEMS, INC.

**RESOLVED**, that the State Energy Resources Conservation and Development Commission (Energy Commission) adopts the staff CEQA findings contained in the CEC-270 Grant Request Form; and

**RESOLVED**, that the Energy Commission approves Agreement PIR-13-009 with **Trevi Systems, Inc.** for \$1,700,000, to demonstrate the effectiveness of a waste heat-driven Forward Osmosis (FO) filtration system.

**FURTHER BE IT RESOLVED**, that the Executive Director or his/her designee shall execute the same on behalf of the Energy Commission.

**CERTIFICATION**

The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the California Energy Commission held on June 18, 2014.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

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Harriet Kallemeyn,  
Secretariat