STATE OF CALIFORNIA

GRANTS/CONTINGENT AWARD REQUEST

CEC-270 (Revised 02/10) CALIFORNIA ENERGY COMMISSION

To: Grants and Loans Office Date: 3/19/2012

Project Manager: Jeffrey Doll Phone Number: 916-327-1713

Office: Energy Efficiency Research Office Division: Energy Research and Development MS- 51

Project Title: Primary Effluent Filtration as an Intermediary Wastewater Treatment Step

Type of Request: *(check one)*

☒ **New Agreement:** *(include items A-F from below)* Agreement Number: PIR-11-018

Program: PIER E / Industrial/ Ag/ Water

Solicitation Name and/or Number: PON-11-501-36 (2011 Emerging Technology Demonstration Grant Program (ETDG II))

Legal Name of Recipient: Kennedy/Jenks Consultants, Inc.

Recipient's Full Mailing Address: 10850 GOLD CENTER DR STE 350

RANCHO CORDOVA, CA 95670-6178

Recipient's Project Officer: Onder Caliskaner Phone Number: (916) 858-2738

Agreement Start Date: 6/29/2012 Agreement End Date: 3/31/2015

☐ **Amendment :** *(Check all that apply)* Agreement Number:

- ☐ Term Extension – New End Date:
- ☐ Work Statement Revision *(include Item A from below)*
- ☐ Budget Revision *(include Item B from below)*
- ☐ Change of Scope *(include Items A – F as applicable from below)*
- ☐ Other:

ITEMS TO ATTACH WITH REQUEST:

A. Work Statement
B. Budget
C. Recipient Resolution, if applicable. (Resolution may be requested in Special Conditions if not currently available.)
D. Special Conditions, if applicable.
E. CEQA Compliance Form
F. Other Documents as applicable
- Copy of Score Sheets
- Copy of Pre-Award Correspondence
- Copy of All Other Relevant Documents

California Environmental Quality Act (CEQA)

☐ CEC finds, based on recipient's documentation in compliance with CEQA:

- ☐ Project exempt: NOE filed:
- ☐ Environmental Document prepared: NOD filed:
- ☐ Other:

☒ CEC has made CEQA finding described in CEC-280, attached

Funding Information:

*Source #1:	PIER-E	Amount:	$ 1,418,800.00	Statute:	10-	FY: 11-12	Budget List #: 501.027I
*Source #2:		Amount:	$	Statute:		FY:	Budget List #:
*Source #3:		Amount:	$	Statute:		FY:	Budget List #:

If federally funded, specify federal agreement number:

*** Source Examples include ERPA, PIER-E, PIER-NG, FED, GRDA, ARFVT, OTHER.**

Business Meeting Approval: *(refer to Business Meeting Schedule)*

Proposed Business Meeting Date: 5/9/2012 ☐ Consent ☒ Discussion

Business Meeting Participant: Jeffrey Doll Time Needed: 5 minutes

Agenda Notice Statement: *(state purpose in layperson terms)*

Possible approval of a ☒ Grant / ☐ Contingent Award to…

Possible approval of Agreement PIR-11-018 for a grant of $1,418,800.00 to Kennedy/Jenks Consultants, Inc. to demonstrate an intermediary treatment step to reduce energy use and increase biomethane production at wastewater treatment plants. (PIER electricity funding) Contact: Jeffrey Doll. (5 minutes)

Project Manager	Date	Office Manager	Date	Deputy Director	Date

Exhibit A
WORK STATEMENT

TASK LIST

Task #	CPR	Task Name
1		Administration
2		Measurement and Verification (M&V) Process and Demonstration Site Coordination
3		Design and Installation of the Demonstration System
4	X	Operation and Detailed Evaluation of the Demonstration System
5		Technology Transfer Activities

KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1	Dr. Onder Caliskaner. P.E. - Kennedy/Jenks Prof. George Tchobanoglous, P.E. (Consultant)		
2	Dr. Onder Caliskaner. P.E. - Kennedy/Jenks		
3	Dr. Onder Caliskaner. P.E. - Kennedy/Jenks Prof. George Tchobanoglous, P.E. (Consultant)	Westech, AAS, Schreiber, Nova	Linda County Water District, City of Roseville
4	Dr. Onder Caliskaner. P.E. - Kennedy/Jenks Prof. George Tchobanoglous, P.E. (Consultant)	Westech, AAS, Schreiber, Nova	Linda County Water District, City of Roseville
5	Dr. Onder Caliskaner. P.E. - Kennedy/Jenks Prof. George Tchobanoglous, P.E. (Consultant)	Westech, AAS, Schreiber, Nova	

GLOSSARY

Specific terms and acronyms used throughout this scope of work are defined as follows:

Term/ Acronym	Definition
BOD	Biological Oxygen Demand
CPR	Critical Project Review
Energy Commission	California Energy Commission
IWTS	Intermediary Wastewater Treatment Step
Kennedy/Jenks	Kennedy/Jenks Consultants
LCWD	Linda County Water District
M&V	Measurement and Verification
PIER	Public Interest Energy Research
RD&D	Research, Development and Demonstration

Exhibit A
WORK STATEMENT

Term/ Acronym	Definition
TSS	Total Suspended Solids
VSS	Volatile Suspended Solids
WWTP	Wastewater Treatment Plant

Problem Statement:

A. Current State of the Technology:

Primary effluent filtration as an intermediary wastewater treatment step (IWTS) has not yet been implemented at wastewater treatment plants (WWTPs), though the potential energy and capital cost savings of the technology are significant. In March 2011, Kennedy/Jenks conducted a Pilot Study at the Dry Creek WWTP in Roseville, CA (Roseville Pilot Study) for four weeks to preliminarily assess the technical feasibility of primary effluent filtration as an IWTS. Twenty-nine tests were performed using two types of filters. Recent commercialization efforts such as the Roseville Pilot Study and this demonstration agreement are in response to the market need for this emerging technology and suitability of the newer wastewater filtration technologies for primary effluent filtration. Roseville Pilot Study results have indicated the feasibility of primary effluent filtration to achieve significant energy savings at WWTPs. The demonstration project is the next step to commercialize this emerging technology to overcome the barriers discussed below.

B. Past Research Efforts:

The Roseville Pilot Study established baseline information to seek opportunities to conduct a longer-term demonstration project. The results from the Roseville Pilot Study support the need for this demonstration project prior to successful implementation of primary effluent filtration technology at WWTPs. The project team has also conducted several other short-term pilot studies for primary effluent filtration for discharge purposes. As the objectives of primary effluent filtration for discharge are quite different (e.g., reduction of Total Suspended Solids (TSS) in discharge as opposed to reduction of Biological Oxygen Demand (BOD) to reduce aeration power requirement in the secondary activated sludge treatment process), these past studies have not addressed the deficiencies for primary effluent filtration as an IWTS.

C. Barriers:

Key barriers/deficiencies for primary effluent filtration as an IWTS can be grouped as follows:

(1) Scientific and Technological: Design, operational, and maintenance criteria do not exist for full-scale installations. Longer-term operational and performance test data are required for the design and operation of full scale installations (i.e., the Roseville Pilot Study was only for one month).

(2) Market: There is no real market for this emerging technology due to lack of consumer knowledge/confidence, and industrial acceptance/approval (as a result of lack

of longer term operational and performance test data). The market support from manufacturers, engineers, academia, and utilities will help commercialize primary effluent filtration as an IWTS. There are no other known or expected barriers for this emerging technology.

Goals of the Agreement:

The goal of the project is to demonstrate that primary effluent filtration is commercially viable and advantageous as an intermediary treatment step to achieve significant energy savings at WWTPs.

Objectives of the Agreement:

The objectives of this Agreement are to:

- Determine the filter removal efficiencies (BOD, TSS, particle size, and Volatile Suspended Solids (VSS)) after the primary clarifiers;
- Determine the decrease in aeration power requirements based on observed filter removal efficiencies;
- Determine the increase in treatment efficiency resulting from primary effluent particle size modification;
- Determine the increase in sludge digestion efficiency and digester gas energy production resulting from increased VSS diverted from filter backwash reject water to the digester;
- Determine and resolve any operational and/or maintenance issues for the different filter technologies;
- Develop operational and design criteria for full-scale installations;
- Develop a process model to predict energy savings at any WWTP in California;
- Determine the energy savings and use a third-party vendor to verify the demonstration results;
- Determine capital and energy savings as a result of the increased secondary treatment capacity; and
- Implement market technology transfer activities for rapid commercialization.

TASK 1 ADMINISTRATION

Task 1.1 Attend Kick-off Meeting

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

The Recipient shall:

- Attend a “Kick-Off” meeting with the California Energy Commission (Energy Commission) Project Manager, the Grants Officer, and a representative of the Accounting Office. The Recipient shall bring its

Project Manager, Agreement Administrator, Accounting Officer, and others designated by the Energy Commission Project Manager to this meeting. The administrative and technical aspects of this Agreement will be discussed at the meeting. Prior to the kick-off meeting, the Energy Commission Project Manager will provide an agenda to all potential meeting participants.

The administrative portion of the meeting shall include, but not be limited to, the following:

- Discussion of the terms and conditions of the Agreement
- Discussion of Critical Project Review (Task 1.2)
- Match fund documentation (Task 1.6)
- Permit documentation (Task 1.7)

The technical portion of the meeting shall include, but not be limited to, the following:

- The Energy Commission Project Manager's expectations for accomplishing tasks described in the Scope of Work
- An updated Schedule of Products
- Discussion of Progress Reports (Task 1.4)
- Discussion of Technical Products (Product Guidelines located in Section 5 of the Terms and Conditions)
- Discussion of the Final Report (Task 1.5)

The Energy Commission Project Manager shall:

- Designate the date and location of this meeting.

Recipient Products:

- Updated Schedule of Products (no draft)
- Updated List of Match Funds (no draft)
- Updated List of Permits (no draft)

Energy Commission Project Manager Product:

- Kick-Off Meeting Agenda (no draft)

Task 1.2 Critical Project Review (CPR) Meetings

The goal of this task is to determine if the project should continue to receive Energy Commission funding to complete this Agreement and to identify any needed modifications to the tasks, products, schedule or budget.

CPRs provide the opportunity for frank discussions between the Energy Commission and the Recipient. CPRs generally take place at key, predetermined points in the Agreement, as determined by the Energy Commission Project Manager and as shown

in the Technical Task List above. However, the Energy Commission Project Manager may schedule additional CPRs as necessary, and any additional costs will be borne by the Recipient.

Participants include the Energy Commission Project Manager and the Recipient and may include the Energy Commission Grants Officer, the Public Interest Energy Research (PIER) Program Team Lead, other Energy Commission staff and Management as well as other individuals selected by the Energy Commission Project Manager to provide support to the Energy Commission.

The Energy Commission Project Manager shall:

- Determine the location, date, and time of each CPR meeting with the Recipient. These meetings generally take place at the Energy Commission, but they may take place at another location.
- Send the Recipient the agenda and a list of expected participants in advance of each CPR. If applicable, the agenda shall include a discussion on both match funding and permits.
- Conduct and make a record of each CPR meeting. One of the outcomes of this meeting will be a schedule for providing the written determination described below.
- Determine whether to continue the project, and if continuing, whether or not modifications are needed to the tasks, schedule, products, and/or budget for the remainder of the Agreement. Modifications to the Agreement may require a formal amendment (please see the Terms and Conditions).
- Provide the Recipient with a written determination in accordance with the schedule. The written response may include a requirement for the Recipient to revise one or more product(s) that were included in the CPR.

The Recipient shall:

- Prepare a CPR Report for each CPR that discusses the progress of the Agreement toward achieving its goals and objectives. This report shall include recommendations and conclusions regarding continued work of the projects. This report shall be submitted along with any other products identified in this scope of work. The Recipient shall submit these documents to the Energy Commission Project Manager and any other designated reviewers at least 15 working days in advance of each CPR meeting.
- Present the required information at each CPR meeting and participate in a discussion about the Agreement.

Energy Commission Project Manager Products:

- Agenda and a list of expected participants (no draft)
- Schedule for written determination (no draft)

- Written determination (no draft)

Recipient Product:

- CPR Report(s) (no draft)

Task 1.3 Final Meeting

The goal of this task is to closeout this Agreement.

The Recipient shall:

- Meet with Energy Commission staff to present the findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement.

  This meeting will be attended by, at a minimum, the Recipient, the Energy Commission Grants Office Officer, and the Energy Commission Project Manager. The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be two separate meetings at the discretion of the Energy Commission Project Manager.

  The technical portion of the meeting shall present an assessment of the degree to which project and task goals and objectives were achieved, findings, conclusions, recommended next steps (if any) for the Agreement, and recommendations for improvements. The Energy Commission Project Manager will determine the appropriate meeting participants.

  The administrative portion of the meeting shall be a discussion with the Energy Commission Project Manager and the Grants Officer about the following Agreement closeout items:
  - What to do with any equipment purchased with Energy Commission funds (Options)
  - Energy Commission's request for specific "generated" data (not already provided in Agreement products)
  - Need to document 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
  - Prepare a schedule for completing the closeout activities for this Agreement

Products:

- Written documentation of meeting agreements (no draft)
- Schedule for completing closeout activities (no draft)

Task 1.4 Monthly Progress Reports

The goal of this task is to periodically verify that satisfactory and continued progress is made towards achieving the research objectives of this Agreement on time and within budget.

The objectives of this task are to summarize activities performed during the reporting period, to identify activities planned for the next reporting period, to identify issues that may affect performance and expenditures, and to form the basis for determining whether invoices are consistent with work performed.

The Recipient shall:

- Prepare a Monthly Progress Report which summarizes all Agreement activities conducted by the Recipient for the reporting period, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Each progress report is due to the Energy Commission Project Manager within 10 days of the end of the reporting period. The recommended specifications for each progress report are contained in Exhibit A, Attachment A-2.

Product:

- Monthly Progress Reports (no draft)

Task 1.5 Final Report

The goal of the Final Report is to assess the project's success in achieving its goals and objectives, advancing science and technology, and providing energy-related and other benefits to California.

The objectives of the Final Report are to clearly and completely describe the project's purpose, approach, activities performed, results, and advancements in science and technology; to present a public assessment of the success of the project as measured by the degree to which goals and objectives were achieved; to make insightful observations based on results obtained; to draw conclusions; and to make recommendations for further RD&D projects and improvements to the PIER project management processes.

The Final Report shall be a public document. If the Recipient has obtained confidential status from the Energy Commission and will be preparing a confidential version of the Final Report as well, the Recipient shall perform the following activities for both the public and confidential versions of the Final Report.

The Recipient shall:

- Prepare an Outline of the Final Report.

- Prepare a Final Report following the approved outline and the latest version of the PIER Final Report guidelines published on the Energy Commission's website at ***http://www.energy.ca.gov/contracts/pier/contractors/index.html*** at the time the Recipient begins performing this task, unless otherwise instructed in writing by the Energy Commission Project Manager. Instead of the timeframe listed in the Product Guidelines located in Section 5 of the Terms and Conditions, the Energy Commission Project Manager shall provide written comments on the Draft Final Report within fifteen (15) working days of receipt. The Final Report must be completed on or before the end of the Agreement Term.
- Submit one bound copy of the Final Report with the final invoice.

Products:

- Draft Outline of the Final Report
- Final Outline of the Final Report
- Draft Final Report
- Final Report

Task 1.6 Identify and Obtain Matching Funds

The goal of this task is to ensure that the match funds planned for this Agreement are obtained for and applied to this Agreement during the term of this Agreement.

The costs to obtain and document match fund commitments are not reimbursable through this Agreement. Although the PIER budget for this task will be zero dollars, the Recipient may utilize match funds for this task. Match funds shall be spent concurrently or in advance of PIER funds for each task during the term of this Agreement. Match funds must be identified in writing and the associated commitments obtained before the Recipient can incur any costs for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a letter documenting the match funding committed to this Agreement and submit it to the Energy Commission Project Manager at least 2 working days prior to the kick-off meeting. 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 such 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 each cash match fund, its source, including a contact name, address and telephone number and the task(s) to which the match funds will be applied
    - Amount of each in-kind contribution, a description, docu-

mented market or book value, and its 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 shall identify its owner and provide a contact name, address and telephone number, and the address where the property is located

- Provide a copy of the letter of commitment from an authorized representative of each source of cash match funding or in-kind contributions that these funds or contributions have been secured.
- Discuss match funds and the implications to the Agreement if they are reduced or not obtained as committed, at the kick-off meeting. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide the appropriate information to the Energy Commission Project Manager if during the course of the Agreement additional match funds are received.
- Notify the Energy Commission Project Manager within 10 days if during the course of the Agreement existing match funds are reduced. Reduction in match funds must be approved through a formal amendment to the Agreement and may trigger an additional CPR.

Products:

- A letter regarding match funds or stating that no match funds are provided (no draft)
- Copy(ies) of each match fund commitment letter(s) (if applicable) (no draft)
- Letter(s) for new match funds (if applicable) (no draft)
- Letter that match funds were reduced (if applicable) (no draft)

Task 1.7 Identify and Obtain Required Permits

The goal of this task 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 not reimbursable under this Agreement. Although the PIER budget for this task will be zero dollars, the Recipient shall budget match funds for any expected expenditures associated with obtaining permits. Permits must be identified in writing and obtained before the Recipient can make any expenditures for which a permit is required.

Exhibit A
WORK STATEMENT

The Recipient shall:

- Prepare a letter documenting the permits required to conduct this Agreement and submit it to the Energy Commission Project Manager at least 2 working days prior to the kick-off meeting. If there are no permits required at the start of this Agreement, then state such in the letter. If it is known at the beginning of the Agreement that permits will be required during the course of the Agreement, provide in the letter:
  - A list of the permits that identifies the:
    - Type of permit
    - Name, address and telephone number of the permitting jurisdictions or lead agencies
- The schedule the Recipient will follow in applying for and obtaining these permits.
- Discuss the list of permits and the schedule for obtaining them at the kick-off meeting and develop a timetable for submitting the updated list, schedule and the copies of the permits. The implications to the Agreement 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 the Progress Reports and will be a topic at CPR meetings.
- If during the course of the Agreement additional permits become necessary, provide the appropriate information on each permit and an updated schedule to the Energy Commission Project Manager.
- As permits are obtained, send a copy of each approved permit to the Energy Commission Project Manager.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the Energy Commission Project Manager within 10 days. Either of these events may trigger an additional CPR.

Products:

- Letter documenting the permits or stating that no permits are required (no draft)
- A copy of each approved permit (if applicable) (no draft)
- Updated list of permits as they change during the term of the Agreement (if applicable) (no draft)
- Updated schedule for acquiring permits as changes occur during the term of the Agreement (if applicable) (no draft)

Exhibit A
WORK STATEMENT

TECHNICAL TASKS

TASK 2 MEASUREMENT AND VERIFICATION (M&V) PROCESS AND DEMONSTRATION SITE COORDINATION

Task 2.1 Confirm the Demonstration Site

The goal of this task is to confirm the demonstration site for the project.

The Recipient shall:

- Verify that the Linda County Water District (LCWD) WWTP can still host the project as the demonstration site, or obtain a new demonstration site (after notifying and obtaining the approval of the Commission Project Manager).
- Provide a Demonstration Site Confirmation Letter to the Commission Project Manager from the selected demonstration site.

Products:

- Demonstration Site Confirmation Letter

Task 2.2 Confirm the Measurement and Verification Contractor

The Recipient has identified a third party measurement and verification (M&V) contractor for the project. The goal of this task is to confirm the availability of M&V contractor for the project.

The Recipient shall:

- Confirm the M&V contractor, or obtain a new contractor (after notifying and obtaining the approval of the Commission Project Manager).
- Execute a contract with the M&V contractor.
- Provide a M&V Contractor Confirmation Letter to the Commission Project Manager confirming third party M&V contractor.

Products:

- M&V Contractor Confirmation Letter

Task 2.3 Coordinate Demonstration Activities with the Demonstration Site

The goal of this task is for the Recipient to coordinate demonstration activities with the LCWD throughout the project.

Exhibit A
WORK STATEMENT

The Recipient shall:

- Conduct monthly meetings with the LCWD General Manager and Board to discuss operational and maintenance procedures and to provide a status update that will include performance results
- Prepare a Quarterly Summary of Coordination Activities with the LCWD.

Products:

- Quarterly Summary of Coordination Activities with the LCWD (no draft)

TASK 3 DESIGN AND INSTALLATION OF THE IWTS DEMONSTRATION SYSTEM

The goal of this task is to design and install the IWTS demonstration system at the LCWD WWTP. The system will include five filtration systems (from four filter manufacturers).

The Recipient shall:

- Prepare IWTS Demonstration System Design Plans and Specifications. The plans will include site, piping, mechanical, structural, and electrical plans, showing filtration systems and appurtenances.
- Prepare a Bill of Equipment and Materials List including all construction materials and equipment (such as pumps, pipes, valves, and sampling and instrumentation equipment).
- Hire a general contractor to manage construction/installation of the demonstration system.
- Provide written notification regarding installation completion and start of demonstration to the Commission Project Manager. The letter will include at a minimum: written documentation that installation of the demonstration is complete and ready for potential inspection, the date of the inspection, and photos of the demonstration system.

Products:

- IWTS Demonstration System Design Plans and Specifications (no draft)
- Bill of Equipment and Materials List
- Written notification regarding installation completion and start of demonstration, including photos of the demonstration system (no draft)

TASK 4 OPERATION AND DETAILED EVALUATION OF THE IWTS DEMONSTRATION SYSTEM

Task 4.1 Operation of the IWTS Demonstration System

The goal of this task is to start-up and operate the demonstration system.

The Recipient shall:

- Prepare a Demonstration System Test Plan that requires:
  - Start-up and testing of the demonstration system for a period of two weeks to identify and implement early operational and maintenance improvements, if necessary.
  - Operation of the demonstration system in four periods, each approximately 6 months in duration for a total of two years. Dividing the two-year demonstration into four periods will allow systematical and careful review of the recent performance and operational data to revise and update the Test Plan after the end of each period, if necessary (to implement the identified necessary operational and maintenance changes in the following period).

Products:

- Demonstration System Test Plan (no draft)

Task 4.2 Measurement and Verification Process

The goal of this task is to conduct a third party M&V process to confirm the energy savings and demonstration results obtained in Task 4.1 that are associated with primary effluent filtration as an IWTS.

The Recipient shall:

- Conduct a third-party M&V process to measure the energy savings resulting from implementation of primary effluent filtration as an IWTS as follows: a) Identify measurement points and systems; b) develop measurement protocols; and c) measure the electrical aeration energy consumption and gas production before the installation of the primary effluent filters as an IWTP.
  - For pre-installation, the electric power consumption of the aeration blowers and digester gas generation will be measured for two weeks and data will be analyzed and extrapolated for annual results based on flow and organic loading profiles of the wastewater.
  - For post installation, the aeration blower and primary effluent filters' energy consumption and digester gas generation will be measured for dry and wet seasons.
  - The Recipient shall analyze the data for annual results based on annual flow and loading profiles. All assumptions for analyzing the data will be documented during demonstration periods 3 and 4 as indicated by Task 4.3.
- Prepare a M&V Report that includes but is not limited to all data collected during the pre and post-installation phase as discussed in the previous bullet, and discusses compliance with the items listed in the "Objectives" section of this Agreement.

Products:

- M&V Report (no draft)

Task 4.3 Detailed Evaluation of Demonstration Results

The goal of this task is to conduct a detailed evaluation of the results obtained in Task 4.2 from the demonstration operation in Task 4.1.

The Recipient shall:

- Review and evaluate the M&V results from demonstration periods 1- 4.
- Prepare Interim Demonstration Evaluation Reports Nos. 1- 4 (including M&V results, photos, analysis, conclusions, and recommendations)
- Prepare a Final Demonstration Evaluation Report that incorporates results from all of the Interim Demonstration Evaluation Reports (including M&V results, photos, analyses, conclusions, and recommendations)

Products:

- Interim Demonstration Evaluation Reports (Nos. 1-4)
- Final Demonstration Evaluation Report

Task 4.4 Process Modeling and Economic Analysis

The goal of this task is to build, calibrate, and use a Process Computer Simulation Model (based on the IWTS demonstration results from Tasks 4.2 and Task 4.3) that can be used for other WWTPs in California.

The Recipient shall:

- Create a Process Computer Simulation Model and instructions, using specific process performance data obtained during the demonstration project.
- Calibrate and verify the model using results from demonstration periods 1- 4.
- Use the model to predict economic, energy, and process benefits to WWTPs in California and total benefits to California.
- Prepare a Process Model Technical Memorandum that includes but is not limited to: a description of the process model, an economic assessment for other WWTPs in California, assumptions, and instructions on how to use the process model.
- Participate in a Critical Project Review and draft a CPR Report per Task 1.2.

Products:

- Electronic copy of Process Computer Simulation Model and instructions
- Process Model Technical Memorandum (no draft)
- CPR Report (no draft)

Exhibit A
WORK STATEMENT

TASK 5 TECHNOLOGY TRANSFER ACTIVITIES

The goal of this task is to develop a plan to make the knowledge gained, experimental results, and lessons learned available to key decision-makers, and to keep the Energy Commission informed of the market penetration of the technology in the years following the demonstration.

The Recipient shall:

- Prepare a Technology Transfer Plan that explains how the knowledge gained in this project will be made available to the public (via conferences, presentations, project flyers, and professional associations). The plan will discuss the following at a minimum: market outreach activities, planned conferences, professional and society meetings, identified potential clients, communication channels, and development and distribution of project flyers.
- Conduct technology transfer activities in accordance with the Technology Transfer Plan. These activities will be reported in the Monthly Progress Reports.

Products:

- Draft Technology Transfer Plan
- Final Technology Transfer Plan