

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 10/2015)

CALIFORNIA ENERGY COMMISSION

New Agreement EPC-15-088 (To be completed by CGL Office)

Division	Agreement Manager:	MS-	Phone
ERDD	Paul Robinson	51	916-327-3310

Recipient's Legal Name	Federal ID Number
Kennedy/Jenks Consultants, Inc.	94-2147007

Title of Project
Biofiltration as an Advanced Primary Treatment Method to Achieve Substantial Energy Savings

Term and Amount	Start Date	End Date	Amount
	6/30/2016	3/31/2020	\$ 1,306,185.00

Business Meeting Information
 ARFVTP agreements under \$75K delegated to Executive Director.

Proposed Business Meeting Date	6/14/2016	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Discussion
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Business Meeting Presenter	Paul Robinson	Time Needed:	5 minutes
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Please select one list serve. EPIC (Electric Program Investment Charge)

Agenda Item Subject and Description

KENNEDY/JENKS CONSULTANTS, INC. Proposed resolution approving agreement EPC-15-088 with Kennedy/Jenks Consultants, Inc. for a \$1,306,185 grant to demonstrate biofiltration as an advanced primary treatment method to reduce total organic load at wastewater treatment plants, to achieve substantial energy and water savings.



California Environmental Quality Act (CEQA) Compliance

1. Is Agreement considered a "Project" under CEQA?
 Yes (skip to question 2) No (complete the following (PRC 21065 and 14 CCR 15378)):
 Explain why Agreement is not considered a "Project":
 Agreement will not cause direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment because

2. If Agreement is considered a "Project" under CEQA:
 a) Agreement **IS** exempt. (Attach draft NOE)
 Statutory Exemption. List PRC and/or CCR section number: _____

Categorical Exemption. List CCR section number: Cal. Code Regs., tit 14, § 15301 -- Cal. Code Regs., tit 14, § 15304

Common Sense Exemption. 14 CCR 15061 (b) (3)
 Explain reason why Agreement is exempt under the above section:

Section 15301: Class 1 consists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination. This proposed project will demonstrate biofiltration of wastewater at an existing wastewater treatment facility, the Linda County Water District Wastewater Treatment Plant. The biofiltration system as an advanced primary treatment method to reduce total organic load at waste water treatment plants, before the secondary aerated activated sludge treatment processes, to achieve substantial energy and water savings. The equipment to be installed at the existing plant includes the demonstration biofiltration system and its appurtenances (e.g., influent and effluent discharge pipes and pumps, flowmeter, turbidity and total suspended solids analyzers). This equipment (in aggregate referred to as "the biofilter" totals approximately 400 square feet and will be mounted on ground level. All installations will be within the Linda County Water District Wastewater Treatment Plant with no impact on other existing infrastructure and operations. The demonstration site is not environmentally sensitive and work under this project will not generate any noises or odors in excess of permitted levels. For these reasons, the proposed project will have no significant effect on the environment and is categorically exempt under section 15301.

Section 15304: Class 4 consists of certain minor alterations in the condition of land, water, and /or vegetation. This proposed project will involve approximately 300 feet of trenching approximately 12 inches deep to house pipes approximately 6 inches in diameter that will connect the biofilter to existing equipment at the Linda County Water District Wastewater Treatment Plant. The trenching will be performed entirely within the boundaries of the wastewater treatment plant; surface will be restored; and no healthy, mature, scenic trees will be removed. For these reasons, the proposed project will have no significant effect on the environment and is categorically exempt under section 15304.

b) Agreement **IS NOT** exempt. (Consult with the legal office to determine next steps.)

- Check all that apply
- | | |
|---|---|
| <input type="checkbox"/> Initial Study | <input type="checkbox"/> Environmental Impact Report |
| <input type="checkbox"/> Negative Declaration | <input type="checkbox"/> Statement of Overriding Considerations |
| <input type="checkbox"/> Mitigated Negative Declaration | |

List all subcontractors (major and minor) and equipment vendors: (attach additional sheets as necessary)

Legal Company Name:	Budget
BASE Energy, Inc	\$ 46,880
WesTech, Inc.	\$ 91,540
Linda County Water District	\$ 25,000
To Be Determined	\$ 95,000
Professor George Tchobanoglous, Ph.D., P.E.	\$ 20,000

List all key partners: (attach additional sheets as necessary)

Legal Company Name:

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Budget Information			
Funding Source	Funding Year of Appropriation	Budget List No.	Amount
EPIC	14-15	301.001B	\$1,306,185
			\$
			\$
			\$
			\$
			\$
R&D Program Area:	EERO: IAW	TOTAL:	\$1,306,185
Explanation for "Other" selection			
Reimbursement Contract #:		Federal Agreement #:	

Recipient's Administrator/ Officer				Recipient's Project Manager			
Name:	Jean Debroux			Name:	Onder Caliskaner		
Address:	303 Second Street, Suite 300 South			Address:	10850 Gold Center Dr, Ste 350		
City, State, Zip:	San Francisco, CA 94107			City, State, Zip:	Rancho Cordova, CA 95670-6178		
Phone:	415-243-2451 /	Fax:	415-896-0999	Phone:	916-858-2700 /	Fax:	- -
E-Mail:	JeanDebroux@KennedyJenks.com			E-Mail:	OnderCaliskaner@KennedyJenks.com		

Selection Process Used	
<input checked="" type="checkbox"/> Competitive Solicitation	Solicitation #: GFO-15-317
<input type="checkbox"/> First Come First Served Solicitation	

The following items should be attached to this GRF			
1. Exhibit A, Scope of Work		<input checked="" type="checkbox"/>	Attached
2. Exhibit B, Budget Detail		<input checked="" type="checkbox"/>	Attached
3. CEC 105, Questionnaire for Identifying Conflicts		<input checked="" type="checkbox"/>	Attached
4. Recipient Resolution	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/>	Attached
5. CEQA Documentation	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/>	Attached

_____ Agreement Manager	_____ Date	_____ Office Manager	_____ Date	_____ Deputy Director	_____ Date
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Exhibit A Scope of Work

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR ¹	Task Name
1		General Project Tasks
2		Execution of Contract with the Demonstration Site(s)
3		Measurement and Verification Study
4		Design, Plan and Installation of the Biofiltration Demonstration System
5	X	Operation of the Biofiltration Demonstration Systems
6		Performance Analysis of the Biofiltration Demonstration System
7		Evaluation of Project Benefits
8		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
APT	Advanced Primary Treatment
BOD	Biochemical Oxygen Demand
BRW	Backwash Reject Water
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CPR	Critical Project Review
CPUC	California Public Utilities Commission
DO	Dissolved Oxygen
EPIC	Electric Program Investment Charge
IPMVP	International Performance Measurement and Verification Protocol
kWh	Kilowatt hour
Linda	Linda County Water District
M&V	Measurement and Verification
mg/L	Milligrams per Liter
MS	Microsoft
Recipient	Kennedy/Jenks Consultants, Inc.
SCADA	Supervisory Control and Data Acquisition
SQL	Structured Query Language
TAC	Technical Advisory Committee
TSS	Total Suspended Solids
VSS	Volatile Suspended Solids
WWTPs	Wastewater Treatment Plants

¹ Please see subtask 1.3 in Part III of the Scope of Work (General Project Tasks) for a description of Critical Project Review (CPR) Meetings.

Exhibit A Scope of Work

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

A. Purpose of Agreement

The purpose of this Agreement is to fund the demonstration of biofiltration as an advanced primary treatment (APT) method to reduce total organic load at wastewater treatment plants (WWTPs), before the secondary aerated activated sludge treatment processes, to achieve substantial energy and water savings.

B. Problem/ Solution Statement

Problem

The most energy intensive unit process at WWTPs is the secondary biological treatment process, with an aerated activated sludge process as the most commonly used method. This method is energy intensive, accomplished by aerating wastewater, and typically accounts for 40 to 60 percent of total WWTP electricity energy consumption. Conventional wastewater treatment technology includes a primary clarification step before the aerated activated sludge treatment step to reduce the amount of organic material entering the aerated activated sludge basins. The total organic load reduction achieved by the primary clarification step is typically between 20 and 30 percent. Achieving a higher grade removal of organic amount before the aerated activated sludge process provides a breakthrough opportunity to significantly reduce the electrical power demand at WWTPs.

Projected population growth, increasingly stringent regulations and aging infrastructure will result in numerous WWTP expansions and upgrade projects over the next 40 years. A focus on reducing aeration energy consumption will minimize the need for new, water-related energy infrastructure.

Solution

Biofiltration as APT is an emerging raw or primary effluent wastewater filtration technology application to reduce total organic load prior to secondary aerated treatment processes. Biofiltration as APT would replace or follow primary clarification to provide superior removal of total organic load, thus reducing electrical energy consumption at downstream aerated activated sludge basins. The electrical power demand at WWTPs will be significantly reduced by achieving a higher degree removal of the total organic load before the aerated activated sludge process.

The proposed biofiltration concept replaces the conventional technology of primary treatment by offering the following three major advantages: (1) reducing the total organic load will decrease the aeration electrical energy required for secondary treatment; (2) the high organic energy content of the removed volatile suspended solids (VSS) in filter backwash reject water (BRW) will increase gas energy production in the anaerobic digester; and (3) by reducing the total organic loading the existing secondary treatment capacity will be significantly increased, thus saving additional electrical energy, water, and capital costs. The ability to avoid or minimize the considerable costs and land usage of primary and secondary process treatment basin sizes provides another significant economic incentive to implement this energy-saving process step.

Exhibit A

Scope of Work

C. Goals and Objectives of the Agreement

Agreement Goals

The goal of this Agreement is to demonstrate that biofiltration as APT is a technically viable and commercially attractive approach for achieving substantial electrical energy and water savings at WWTPs.

Ratepayer Benefits:² This Agreement will result in the ratepayer benefits of greater electricity reliability and lower costs by implementing biofiltration as APT at WWTPs in California. Biofiltration has produced impressive performance data through a 6-month pilot study at the Springfield, OH WWTP (Springfield Pilot Study), confirming the potential for significant energy and water savings focused on the high removal rates of total suspended solids (TSS) and particulate and soluble biochemical oxygen demand (BOD). Based on the Springfield Pilot Study results and conceptual process model, the aeration power requirement in the downstream aerated activated sludge process is estimated to decrease by 45 to 60 percent (depending on specific WWTP conditions) compared to conventional primary treatment. Assuming an ultimate 25 percent implementation of the technology, it is estimated that the annual electrical energy and associated cost savings for California ratepayers will be 110,000,000 kWh and \$12,900,000 per year, respectively. The resultant reduction in annual greenhouse gas emissions is anticipated to be approximately 80,300,000 lbs. carbon dioxide equivalent.

Another inherent potential benefit of this emerging technology is peak load reduction in WWTPs resulting in more reliable and effective treatment while further increasing electrical cost savings to ratepayers. Additionally, the estimated annual water savings at 25 percent implementation is 1,055 million gallons, further reducing utility costs to ratepayers. The proposed technology would also reduce the production cost of recycled water which should assist the State in reaching its goals for increasing use of recycled water. Biofiltration as APT also avoids or minimizes the considerable capital costs and land usage of conventional primary and secondary treatment basins, providing another major economic incentive that passes savings on to ratepayers. Assuming 25% implementation, the estimated cost savings for California will be approximately \$940 million.

Technological Advancement and Breakthroughs:³

Biofiltration is an important breakthrough in the wastewater treatment industry. Biofiltration merges biological treatment and filtration in a single process. The innovative key difference between biofiltration and standard wastewater treatment is the removal of soluble Biochemical Oxygen Demand (BOD) in addition to particulate BOD. Municipal WWTP agencies are relatively conservative with regards to new technologies due to the need for continuous, reliable operation, and stringent permit requirements for effluent discharge quality. Continuous operational and removal performance information for this emerging technology obtained from the proposed 3-year deployment of an industrial scale demonstration system will help develop the required consumer confidence and industry and regulatory approval and acceptance.

² California Public Resources Code, Section 25711.5(a) requires projects funded by the Electric Program Investment Charge (EPIC) to result in ratepayer benefits. The California Public Utilities Commission (CPUC), which established the EPIC in 2011, defines ratepayer benefits as greater reliability, lower costs, and increased safety (See CPUC "Phase 2" Decision 12-05-037 at page 19, May 24, 2012, http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF).

³ California Public Resources Code, Section 25711.5(a) also requires EPIC-funded projects to lead to technological advancement and breakthroughs to overcome barriers that prevent the achievement of the state's statutory and energy goals.

Exhibit A

Scope of Work

Agreement Objectives

The objectives of this Agreement are to:

- Install and demonstrate a biofiltration system at an existing wastewater treatment plant.
- Quantify the reduction in electrical energy required for aeration in the activated sludge process.
- Quantify the decrease in electrical energy required for mixing due to the reduced activated sludge volume requirements.
- Quantify the electrical savings resulting from increased digester gas production.
- Determine the overall capital and electrical energy savings resulting from the increased secondary treatment capacity.
- Determine the water savings in WWTPs using biofiltration.
- Determine the reduction in recycled water production costs and resultant water savings.
- Demonstrate biofiltration removal efficiencies for total, particulate, and soluble BOD, VSS, and TSS.
- Assess biofiltration as APT to provide equalization for peak load (energy) demands.
- Develop operational, maintenance, and design criteria for full-scale installations such as biofiltration hydraulic and solids loading rates.
- Conduct a third party measurement and verification (M&V) process.
- Implement a structured marketing and technology transfer activity plan to reach out to a wider audience in the wastewater treatment industry.

III. TASK 1 GENERAL PROJECT TASKS

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, including the Final Report Outline and Final Report

- 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.
- Consider incorporating all CAM comments into the final product. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product.

Exhibit A Scope of Work

- Submit the revised product and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period, or approves a request for additional time.

For products that require a final version only

- Submit the product to the CAM for acceptance. The CAM may request minor revisions or explanations prior to acceptance.

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 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, (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).

Exhibit A Scope of Work

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.

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);
- Critical Project Review (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:

Exhibit A Scope of Work

- Kick-off Meeting Agenda

Subtask 1.3 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.
- 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:

Exhibit A Scope of Work

- 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.
- 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

Exhibit A

Scope of Work

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 project 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 progress made on all Agreement activities as specified in the scope of work for the preceding month, including accomplishments, problems, milestones, products, schedule, fiscal status, and 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.
- Submit a monthly or quarterly *Invoice* that follows the instructions in the “Payment of Funds” section of the terms and conditions, including a financial report on Match Fund and in-state 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 Agreement. The CAM will review 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 the 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. (See Task 1.1 for requirements for draft and final products.)

Recipient Products:

- Final Report Outline (draft and final)

CAM Product:

- Style Manual
- Comments on Draft Final Report Outline
- Acceptance of Final Report Outline

Subtask 1.6.2 Final Report

The Recipient shall:

- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline, Style Manual, and Final Report Template provided by the CAM with the following considerations:
 - Ensure that the report includes the following items, in the following order:

Exhibit A Scope of Work

- Cover page (**required**)
- Credits page on the reverse side of cover with legal disclaimer (**required**)
- Acknowledgements page (optional)
- Preface (**required**)
- Abstract, keywords, and citation page (**required**)
- Table of Contents (**required**, followed by List of Figures and List of Tables, if needed)
- Executive summary (**required**)
- Body of the report (**required**)
- References (if applicable)
- Glossary/Acronyms (If more than 10 acronyms or abbreviations are used, it is required.)
- Bibliography (if applicable)
- Appendices (if applicable) (Create a separate volume if very large.)
- Attachments (if applicable)
- Ensure that the document is written in the third person.
- Ensure that the Executive Summary is understandable to the lay public.
 - Briefly summarize the completed work. Succinctly describe the project results and whether or not the project goals were accomplished.
 - Identify which specific ratepayers can benefit from the project results and how they can achieve the benefits.
 - If it's necessary to use a technical term in the Executive Summary, provide a brief definition or explanation when the technical term is first used.
- Follow the Style Guide format requirements for headings, figures/tables, citations, and acronyms/abbreviations.
- Ensure that the document omits subjective comments and opinions. However, recommendations in the conclusion of the report are allowed.
- Include a brief description of the project results in the Abstract.
- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt
- Consider incorporating all CAM comments into the Final Report. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product
- Submit the revised Final Report and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period or approves a request for additional time.
- Submit one bound copy of the *Final Report* to the CAM along with *Written Responses to Comments on the Draft Final Report*.

Products:

- Final Report (draft and final)
- Written Responses to Comments on the Draft Final Report

CAM Product:

- Written Comments on the Draft Final Report

Exhibit A Scope of Work

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 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)*

Exhibit A Scope of Work

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 not reimbursable under this Agreement, with the exception of costs incurred by University of California recipients. 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.

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.

Exhibit A Scope of Work

- 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 project direction. The guidance may include scope and methodologies, timing, and coordination with other projects. 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 projects (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 the project 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 project products.

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

- Researchers knowledgeable about the project subject matter;
- 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.

Exhibit A Scope of Work

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.
- 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

Exhibit A Scope of Work

IV. TECHNICAL TASKS

TASK 2: EXECUTION OF CONTRACT WITH THE DEMONSTRATION SITE

The goals of this task are to: (1) confirm the availability of the project demonstration site at the Linda County WWTP; and (2) execute any agreements necessary to secure the demonstration site.

For any changes in site location, the Recipient must check with their CAM or CAO who will provide guidance regarding the level of Commission approval required.

The Recipient shall:

- Reach agreement with the manager of the selected demonstration site regarding the project timeline, space reserved for the project, and equipment installation.
- Execute a contract with the demonstration site for the Recipient's use of the site and provide the CAM with a *Copy of Contract with the Demonstration Site*.

Products:

- Copy of Contract with the Demonstration Site

TASK 3: MEASUREMENT AND VERIFICATION STUDY

The goals of this task are to: (1) select a Measurement & Verification subcontractor; (2) execute any agreements necessary to secure M&V subcontractor at the designated demonstration site; and (3) ensure M&V processes and authentication of electrical energy savings resulting from the decrease in secondary treatment aeration requirements with the implementation of biofiltration as an APT method.

Subtask 3.1 Selection and Execution of a Sub-Contract with a Measurement and Verification (M&V) Subcontractor

The Recipient shall:

- Select a subcontractor capable of providing independent, third-party energy savings from and efficacy of the biofiltration system.
- Ensure the selected M&V subcontractor's ability to provide required hardware, software, and staff to conduct the required measurements during the project term.
- Ensure that the selected M&V subcontractor will follow utility M&V protocols according to International Performance Measurement and Verification Protocol (IPMVP), and will prepare a detailed analytical report that verifies energy consumption and engineering calculations for energy and cost savings.
- If the selected M&V subcontractor becomes unavailable during the project term, work with the CAM to select a new M&V subcontractor.
- Execute a Contract with the M&V subcontractor that secures the subcontractor's services during the project term and ensures that the subcontractor will follow utility M&V protocols and prepare a detailed analytical report, and provide a *Copy of Contract with the M&V Subcontractor*

Products:

- Copy of Contract with the M&V subcontractor

Exhibit A Scope of Work

Subtask 3.2 Preparation and Execution of Measurement and Verification Plan and Protocol

The Recipient shall:

- Prepare design documents including process and instrumentation drawings for the demonstration site.
- Work in collaboration with M&V subcontractor to obtain WWTP data, including:
 - Relevant wastewater flows (at best resolution possible for duration of measurement period (12 months));
 - Total, soluble, and particulate BOD of influent and effluent to and from the biofilter system for the duration of the 12-month measurement and verification period;
 - Air flow directed to aeration basins for duration of measurement period;
 - Dissolved oxygen (DO) data for duration of measurement period;
 - Aeration blower performance curves;
 - Digester gas production for duration of measurement period.
- Work in collaboration with M&V subcontractor to develop *M&V Plan* according to the International Performance Measurement and Verification Protocol (IPMVP) including the following:
 - Use option B of IPMVP to determine the effects of the biofiltration as an APT method on the energy consumption of the aeration system for both pre-installation (no biofiltration) and post-installation (with biofiltration system) cases.
 - Calculate and verify energy savings based on the reduced energy consumption of the aeration system and mixing in aerated activated sludge secondary treatment process.
- Work in collaboration with M&V subcontractor to develop *M&V Protocol for Pre-Install* (no biofiltration). The M&V Protocol shall include but not be limited to the following:
 - Energy consumed for aeration and mixing based on plant Supervisory Control and Data Acquisition (SCADA) or data logging;
 - Biogas production based on plant SCADA or plant-installed flow meter;
 - Power and current logging of aeration and mixing of secondary treatment system.
- Work with the M&V subcontractor on pre-installation and post-installation measurements, including:
 - Electric current logging of all pumps and mixers associated with the baseline system and proposed system;
 - Spot power measurement of pumps and mixers to establish the associated voltage and power factor of the pumps and mixers;
 - Electric power logging of the blowers associated with the baseline system and proposed system.
- Work with the M&V subcontractor to perform pre-installation measurements for a period of 12 months and post-installation measurements for 12 months. This period will cover both dry and wet weather periods and result in annual flow profile for one year.
- Analyze pre-install energy consumption of aeration and mixing of the secondary treatment system and gas production based on normalized wastewater flow and loading.
- Work in collaboration with M&V subcontractor to develop and execute *M&V Protocol for Post-Install* (with biofiltration). The *M&V Protocol for Post-Install* shall include measurement of:

Exhibit A Scope of Work

- Energy consumed by the aeration and mixing of secondary treatment systems based on plant SCADA or data logging;
 - Energy consumed by biofilter (i.e. backwash blowers and pumps involved with biofiltration system);
 - Biogas production based on SCADA or plant-installed flow meter.
- Ensure that subcontract includes terms on, and perform site visits to ensure, installation and removal of M&V subcontractor's measurement equipment.
- Obtain the following wastewater flow and quality data according to the operation protocol of the biofiltration demonstration system for the duration of the 12-month measurement period:
 - Plant wastewater flow with the best available resolution;
 - Flow through the Biofilter with the best available resolution;
 - Total BOD, Soluble BOD, VSS, and TSS of the biofilter influent wastewater;
 - Total BOD, Soluble BOD, VSS, and TSS of the biofilter effluent wastewater;
 - Total BOD, Soluble BOD, VSS, and TSS of the plant effluent wastewater;
 - DO data for aeration basin;
 - Air flow directed to the aeration basins.
- Work in collaboration with M&V subcontractor to perform post-install measurements, which may include:
 - Power measurement and current logging of pumps and blowers associated with biofilter system
 - Power measurement and current logging of aeration and mixing for secondary treatment systems
- Analyze post-install energy consumption of secondary treatment systems and gas production based on normalized wastewater flow and content. Data to be analyzed will include but not be limited to:
 - Energy consumption of system with proposed biofiltration deployment;
 - Energy consumption of aeration and mixing for secondary treatment system;
 - Digester gas generation with proposed biofilter deployment.
- Work in collaboration with M&V subcontractor to prepare Quarterly *M&V Study Progress Report*, including evaluation of the pre-install and post-install systems, discussion of the pre- and post-installation M&V and determination of the following:
 - Energy savings due to (1) application of biofiltration system due to less aeration required for secondary treatment system, and (2) decrease in mixing requirement, as a result of a decrease in activated sludge basin size;
 - Increase in digester gas generation.
- Work in collaboration with M&V subcontractor to prepare *M&V Report* with detailed findings and analyses, including:
 - Introduction of project;
 - Description of system (pre-install and post-install);
 - Measurement and Verification Plan Protocol (pre-install and post-install);
 - Results and analysis of energy savings due to (1) application of biofiltration system due to less aeration required from secondary treatment system, and (2) decrease in mixing requirement, as a result of a decrease in activated sludge basin size;
 - Increase in digester gas generation;
 - Secondary treatment aeration requirements (with and without biofiltration);
 - Wastewater flow and quality using the biofiltration demonstration system;
 - Discussion of results and issues that occurred during monitoring.

Exhibit A Scope of Work

Products:

- M&V Plan (draft and final)
- M&V Protocol for pre-install (draft and final)
- M&V Protocol for post-install (draft and final)
- M&V Study Progress Report
- M&V Report (draft and final)

TASK 4: DESIGN, PLAN AND INSTALLATION OF THE BIOFILTRATION DEMONSTRATION SYSTEM

The goal of this task is to design, plan and install the biofiltration system for operation at confirmed demonstration site.

The Recipient shall:

- Design and prepare *Demonstration System Plans and Specifications* for the Biofiltration demonstration system. The plans shall include:
 - Site, piping, mechanical, structural, instrumentation, and electrical plans, showing the wastewater biofiltration system and appurtenances.
 - The design of the system at the demonstration site for installation and operation of the biofiltration system before or after the primary clarifiers (both operational alternatives will be demonstrated).
- Install the biofiltration system at the existing demonstration site. The system shall include, but not be limited to: biofilter system, influent pipeline and pumps to the biofilter, flow and removal performance monitoring system, and biofilter effluent pipeline.
- Provide written *Notification of Installation Completion* once the equipment has been installed and the post-installation M&V commences.

Products:

- Demonstration System Plans and Specifications (draft and final)
- Notification of Installation Completion

TASK 5: OPERATION OF THE BIOFILTRATION DEMONSTRATION SYSTEMS

The goals of this task are to start-up and operate the demonstration system by conveying: (1) raw wastewater (after screens) or primary effluent to the biofiltration system, (2) biofilter effluent to the secondary aerated activated sludge basin, and (3) biofilter BRW to the thickener and then to the anaerobic digester.

The Recipient shall:

- Provide and prepare a *Demonstration System Operations and Testing Plan*. The test plan shall include, but not be limited to:
 - A description of the processes and equipment to be operated and tested;
 - Specifications for machine performance;
 - Test objectives and technical approach;
 - A description of the facilities, equipment and instrumentation that will be used;
 - A description of testing procedures.
- Start-up and test the demonstration system for a period of one month to identify and implement early operational and maintenance improvements, if necessary.

Exhibit A Scope of Work

- Operate the demonstration system in 3 phases. Dividing the three-year project (including analysis and reporting) into 3 demonstration phases 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 any identified necessary operational and maintenance changes in the following period).
 - Phase 1: 12 months (Mar 2017 – Mar 2018): Demonstration of biofiltration as PEF system
 - Phase 2: 12 months (Mar 2018 – Mar 2019): Demonstration of biofiltration as PF system
 - Phase 3: 6 months (Mar 2019 – Sep 2019): Operational mode (i.e., as PEF or PF) and necessary protocol changes to be determined based on results obtained from the first two phases.
- Operation of the demonstration activities will include the following:
 - Operation
 - Maintenance
 - Troubleshooting
 - Performance Improvement
 - Optimization
- Prepare *Demonstration System Operations and Testing Progress Report* for each Phase including but not limited to the following:
 - Test plan update,
 - Summary of operational and maintenance activities
 - Observations of system performance
 - Photos of each phase
 - Identification of operational and maintenance changes necessary for the subsequent phase.
- Conduct inline continuous field measurements related to wastewater treatment performance and electrical power consumption and report results in *Demonstration System Operations and Testing Progress Reports*.
- Collect wastewater samples and conduct sampling for offsite laboratory analyses and report results in *Demonstration System Operations and Testing Progress Report*.
 - Sampling shall include biofilter influent and effluent.
 - Samples shall be analyzed for a number of analytes including but not limited to BOD and TSS.
- Conduct CPR meeting and prepare CPR Report as described in Subtask 1.3.

Products:

- Demonstration System Operations and Testing Plan (draft and final)
- Demonstration System Operations and Testing Progress Reports
- CPR Report

TASK 6: PERFORMANCE ANALYSIS OF THE BIOFILTRATION DEMONSTRATION SYSTEM

The goal of this task is to conduct a detailed performance analysis based on the results of operation of the demonstration system.

The Recipient shall:

- Prepare a *Performance Analysis Progress Report* for each of the 3 phases which includes:

Exhibit A Scope of Work

- Compilation of all the demonstration performance data including:
 - Analysis of inline field measurements and offsite laboratory sampling results of biofilter influent and effluent parameters including but not limited to BOD and TSS;
 - Analysis of wastewater treatment and hydraulic performance results.
- Evaluate all of the performance data obtained from the biofiltration system demonstration.
- Establish, calibrate, and use a process computer model (using biofiltration as APT for raw wastewater and primary effluent) to simulate performance and benefits at full flow rates for the demonstration site and typical WWTPs in California. Discuss both results in a *Process Computer Model Report*.

Products:

- Performance Analysis Progress Report (draft and final)
- Process Computer Model Report (draft and final)

TASK 7: 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 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 project 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.

Exhibit A Scope of Work

- 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 project.
 - Published documents, including date, title, and periodical name.
 - A discussion of policy development. State if the project has been cited in government policy publications or technical journals, or has been used to inform regulatory bodies.
 - The number of website downloads.
 - An estimate of how the project information has 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 project.
 - A discussion of project 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
- Mid-term Benefits Questionnaire
- Final Meeting Benefits Questionnaire

TASK 8: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

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. Use the format provided by the CAM.
- Prepare a *Final Project Fact Sheet* at the project's conclusion that discusses 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.

Exhibit A Scope of Work

- 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 project 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 project results.
- 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.
- When directed by the CAM, develop *Presentation Materials* for an Energy Commission-sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the California Energy Commission.
- Provide at least (6) six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.
- 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)
- Presentation Materials (draft and final)
- High Quality Digital Photographs
- Technology/Knowledge Transfer Plan (draft and final)
- Technology/Knowledge Transfer Report (draft and final)

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: KENNEDY/JENKS CONSULTANTS, INC.

RESOLVED, that the State Energy Resources Conservation and Development Commission (Energy Commission) adopts the staff CEQA findings contained in the Agreement or Amendment Request Form (as applicable); and

RESOLVED, that the Energy Commission approves Agreement EPC-15-088 from GFO-15-317 with Kennedy/Jenks Consultants, Inc. for a \$1,306,185 grant to demonstrate biofiltration as an advanced primary treatment method to reduce total organic load at wastewater treatment plants, to achieve substantial energy and water savings. The demonstration site is in Northern California; and

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 14, 2016.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

Cody Goldthrite,
Secretariat