

Phase II Ex Ante Review Findings

Table 1-1: Project Information

IOU	PG&E
Application ID	WEP1031653
Application Date	Not provided
Program ID	PGE2236
Program Name	Agriculture and Food Wastewater Energy Program (WEP)
Program Year	2012
Itron Project ID	X344
IOU Ex Ante Savings Date	06/07/2013
ED Measure Name	Wastewater treatment
Project Description	Water recovery, filtration, pump controls, and aeration.
Date of ED Review(s)	6/11/13
Primary Reviewer / Firm	Blake Ringeisen / Itron
Review Supervisor / Firm	Joseph Ball / Itron
ED Project Manager	██████████ / California Public Utilities Commission, Energy Division
ED Policy Authorization (as needed)	
Type of Review (Desk, On-site, Full M&V, Tool)	Desk
ED Recommendation	ED approves the estimated energy savings for this project (308,923 kWh; 129.3 kW). If the IOU-estimated savings after post-installation M&V and true-up change by more than ten percent of the ED-approved savings then ED may elect further review at that time. In such case, ED requests to be informed by the IOU.

Measure Description

There are seven measures in this application as described below:

1. Recover a Portion of the MPE Recirculation Water and Send to Clean Unloading Water Pit
2. Recover Water from Diced Tomato Heat Exchanger Collection Tank and Route to Secondary Paste Flume
3. Recover a Portion of the Discharge Water from Paste Flume after Rotary Screen and Offset Elevator Jet Makeup Water
4. Install an Alternative Filtration System for the Pump Seal Flush Water
5. Recover Water from the Pump Seal Flush Systems in Various Areas of the Plant
6. Install Variable Frequency Drives on Central Pit Pumps
7. Install Automatic Dissolved Oxygen Control on the Aerators in Ponds B and C

Measures 1, 2, 3, and 5 are water recovery measures. The facility currently disposes tomato processing wastewater into open fields, and proposes to reuse a portion of the water from several processes. This will save vast amounts of water in addition to pumping energy.

Annual energy savings are estimated to be 308,923 kWh and demand savings are estimated to be 129.3 kW, in addition to water savings of 83,131,576 gallons/yr. Incentive rates of \$0.09/kWh and \$100/kW were used to estimate a project incentive of \$40,733. Using an energy cost of \$0.12/kWh, total cost savings were calculated to be \$37,071/year.

Summary of Review

The Investor-Owned-Utility (IOU) submitted the following documents prior to the Phase I review:

- [Customer Name & Location]_Draft.pdf, entitled Energy and Water Audit Report

During the parallel review process, the IOU provided ED with the following documents:

- [Customer Name & Location]__Calculations BASE.xlsx
- [Customer Name]_.xlsx, Billing History
- [Customer Location] Well and Sump Volumes 2011.xlsx

The IOU then submitted the following document in response to ED's Phase I review:

- Response to Phase I Ex Ante Findings_Confidential.docx

Six of the seven measures are add-on equipment retrofits and are eligible under program rules. ED agrees that the baseline for all measures is the existing equipment and operating conditions. One measure, EEM-4, is a replacement measure, retrofitting an existing reverse osmosis system with an alternative one. After receiving the IOU response clarifying this measure, ED now agrees that the EUL for EEM-4 is 15 years and is also eligible for receiving incentives.

Although the IOU used the term incremental costs, full measure costs apply for add-on measures. The IOU submitted combined estimated full project cost of \$124,600 including installation. The IOU responded by saying final invoices will be provided after installation is complete.

The assumptions made in the savings calculations for these measures appear acceptable; however, ED will want to ensure certain parameters, such as operating hours and flow rates, are verified during post-installation M&V.

The following points are the IOU's responses to ED's requests:

After the Phase I review, ED requested that the IOU perform the following actions. As part of the Phase II review, the IOU's responses are now included below each item.

1. Provide final invoices broken out by measure, material and labor, when available.

These will be provided after installation is complete.

2. ED recommends the implementer to install permanent flow meters on all water recovery pipelines. This will verify the flow estimates used in ex ante calculations and provide data for post-installation adjustments to savings.

We will inform the customer of your recommendation. If permanent flow meters are not installed, we will perform flow measurements on each water recovery line. Please see the attached Updated M&V Plan.

3. Modify M&V plan to include more details such as the specific parameters to monitor, logging duration and intervals. In addition to current measurement, voltage and PF readings should also be taken for a minimum of five minutes during normal operation.

See the attached and updated M&V plan.

4. Provide post-install IR, revised savings calculations, and the flow data obtained from newly installed flow meters from item #2 above.

As stated above, if flow meters are not installed then flowrate measurements will be taken on each water recovery line. The installation report and revised savings calculations will be provided after installation is complete.

5. Submit a live spreadsheet showing final proposed savings.

Will be provided after installation is complete.

6. Provide additional evidence to demonstrate the eligibility of EEM 4.

The existing operation of the RO unit is that it serves two separate processes: the boiler system, and the pump seals. We are recommending that they replace RO water with Bag

Filter water for only one process: the pump seals. This is why they must be operated in parallel.

As far as the 3-year EUL, this is for the bag part of the system only. The bags are meant to be disposable, and according to the Eaton DURAGAF Market Spotlight: HVAC report, they cost approximately \$8 per bag. This application is not HVAC, but it is expected to have similar bag replacement costs. The 15 year EUL is for the system as a whole, which consists of:

- The bag filter housing, similar to an automatic filter with an EUL of 15 years, source: Chartered Institution of Building Services Engineers OOM Table (<http://www.cibse.org/pdfs/newOOMtable1.pdf>)
- the tie-in to the existing pump seal distribution pipeline, with an EUL of 25 – 40 years depending on material, source: Chartered Institution of Building Services Engineers OOM Table (<http://www.cibse.org/pdfs/newOOMtable1.pdf>)
- the distribution water pumps, with an EUL of 15 years from the “Water Loop Pumps” category, source: “DEER EUL Summary 10-1-08” spreadsheet
- the water storage tank, with an EUL of 12 – 35 years depending on material, source: Chartered Institution of Building Services Engineers OOM Table (<http://www.cibse.org/pdfs/newOOMtable1.pdf>)

In general, the Chartered Institution of Building Services Engineers OOM Table classifies a “Water Treatment Plant” as 15 years, which we believe is a reasonable EUL.

7. Will a SCADA system be installed? If so, what parameters will be monitored and at what intervals? Could daily well water usage data be supplied? Could daily flow rates from each reclamation point be supplied?

We will ask the customer, but we do not believe the wastewater system will be sophisticated enough to warrant the installation of a SCADA system. Daily well water usage can be supplied. Daily flow rates may be able to be supplied, but this will depend on the installation of permanent flow meters; otherwise, measured flow rates can be supplied.

8. EEM 7 [Install Automatic Dissolved Oxygen Control on the Aerators in Ponds B and C]: ED Recommends 8 years [EUL], based on other sensing device controls in DEER 2008 database

The DEER database has occupancy sensors and daylight sensors with an EUL of 8 years. A DO control system consists of DO sensors and a PLC, which would be similar to a VFD with an EUL of 15 years in most cases in the DEER database. Since this system consists of both the sensors (EUL 8 years) and the PLC (EUL 15 years), we propose to use an overall EUL of 10 years based on the “Wastewater Treatment Control and Measurement Equipment”

category in the Chartered Institution of Building Services Engineers OOM Table (<http://www.cibse.org/pdfs/newOOMtable1.pdf>).

Review Conclusion

The conclusion of the Phase II review is that EEM 4 is valid and that the following estimated savings are approved subject to adjustments made after the post-installation inspection M&V and true-up: 308,923 kWh; 129.3 kW.

Table 1-2 Review Findings

Reviewed Parameter	Analysis
Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization, Add-on Measures) Note: For early retirement projects only, include RUL through EUL baseline)	IOU Proposal: All measures (1-7) are add-on measures.
	ED Assessment: EEM 4 is a replacement measure. All others are add-ons.
	ED Recommendation: None
Project Baseline Technology (in situ equipment, Title 24 (specify year), other code or other efficiency level (specify), industry standard practice - ISP)	IOU Proposal: In situ equipment with current operations
	ED Assessment: Same
	ED Recommendation: None
Project Cost Basis (Full Incremental, or Both. Note: For early retirement projects, include RUL through EUL cost basis treatment)	IOU Proposal: Total incremental cost of \$124,600
	ED Assessment: ED assumes that \$124,600 is full project cost. Full measure costs are acceptable for add-on measures.
	ED recommendation: None
RUL (required for early retirement projects only, otherwise N/A)	IOU Proposal: N/A
	ED Assessment: N/A
	ED recommendation: N/A
EUL (for each measure)	IOU Proposal: 15 years for all measures
	ED Assessment: For EEM 1, 2, 3, 4, 5, and 6: 15 year EUL based on DEER 2008 database for VFD pumping and pipeline projects EEM 7: ED recommends 10 years based on IOU's response.
	ED Recommendation: None
	IOU Proposal: Many assumptions were made by IOU. Key parameters below can be verified during post-installation M&V. <ol style="list-style-type: none"> 1. Facility personnel's estimates of flow rates leading to recoverable water 2. Recommended equipment/systems will be installed 3. Operating hours
Savings Assumptions	ED Assessment: IOU assumptions seem reasonable. ED recommends the verification of flow rates and hours of operation during post install

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Reviewed Parameter	Analysis
	M&V.
	ED Recommendation: ED recommends the verification of flow rates and hours of operation during post install M&V for all water recovery measures.
Calculation Methods/Tool review	IOU Proposal: Custom spreadsheet analysis
	ED Assessment: Acceptable method
	ED Recommendation: True-up savings after post installation M&V and submit live fully functional spreadsheet
Pre- or Post-Installation M&V Plan	IOU Proposal: The following M&V plan was submitted: <ol style="list-style-type: none"> 1. Water consumption will be determined based on metered data for the 2013 season in order to determine water savings. The total energy savings will be calculated based on the normalized water consumption compared to baseline water consumption. 2. The installed systems will be inspected. Power measurements will be taken on all installed equipment, if operating during the post-field inspection. 3. Current loggers will be installed on the surface turbine aerator motors and the central pit wastewater pumps.
	ED Assessment: ED reviewed the M&V plan and finds it adequate. ED highly recommends that the customer installs quality flow meters be installed on all recovered water pipelines.
	ED Recommendation: None
Net-to-Gross Review	IOU Proposal: Not addressed
	ED Assessment: Not accessed
	ED Recommendation: TBD

Table 1-3 Energy Savings Summary

Description	IOU Ex Ante Claim	ED Recommendations
First Year kWh Savings	308,923	308,923
First Year Peak kW Savings	129.3	129.3
First Year Therms Savings	N/A	N/A
kWh Savings (RUL Period)	N/A	N/A
Peak kW Savings (RUL Period)	N/A	N/A
Therms Impact (RUL Period)	N/A	N/A
kWh Savings (RUL thru EUL Period)	308,923	308,923
Peak kW Savings (RUL thru EUL Period)	129.3	129.3
Therms Savings (RUL thru EUL Period)	N/A	N/A
Annual Non-IOU Fuel Impact (RUL Period)	N/A	N/A
Annual Non-IOU Fuel Impact (RUL thru EUL Period)	N/A	N/A