Pacific Gas and Electric Company®

Advanced Pumping Efficiency Program

APEP

Policies and Procedures Manual

What's Inside:

The information in this Policies and Procedures manual is current as of May 3, 2017. The Advanced Pumping Efficiency Program (APEP) may be modified or terminated at any time. Please contact the main APEP Program Office for up-to-date information, especially if you are applying for an incentive for a pump retrofit/replacement project. The APEP Program Office can be contacted by calling toll free, 1 (800) 845-6038. You may also log on to the APEP web site at www.pumpefficiency.org for more information and a knowledge-base for pumping efficiency.

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The Advanced Pumping Efficiency Program

I. What is the Advanced Pumping Efficiency Program?

The Advanced Pumping Efficiency Program (APEP) is an educational and incentive program intended to improve overall water pumping efficiency and encourage energy conservation in California.

APEP is available through Pacific Gas and Electric Company's Customer Energy Efficiency offerings, funded through the Public Purpose Programs Charge under the auspices of the California Public Utilities Commission. This is a fee paid by all accounts of the major investor-owned utilities in California including PG&E, Southern California Edison Company, Southern California Gas Company, and San Diego Gas and Electric Company. The purpose of this fee is to fund activities that improve energy efficiency and promote energy conservation.

II. How Long is APEP Active?

APEP has funding currently authorized through December 31, 2017. However, APEP may be terminated or modified without notice. This program has a limited budget. Requests for pump efficiency tests or applications for an incentive for a pump retrofit/replacement are accepted on a first-come, first-served basis until available funds are allocated or the end of the program, whichever comes first. Check the APEP web site at www.pumpefficiency.org or call APEP toll-free at (800) 845-6038 for up-to-date information.

III. What Does APEP Do?

APEP has four program components:

1. Education – educational seminars concerning pumping system specification and maintenance, water management, and water measurement will be given throughout the state. The educational message has four parts:
   - Know how to specify an efficient pumping system
   - Know how to maintain an efficient pumping system
   - Know how much water needs to be pumped
   - Know how much water has been pumped

2. Technical Assistance – Program personnel are available to help in locating pump efficiency testers, completing a pump retrofit/replacement incentive application form, or answer general questions as to pumping system design and use. Note that site-specific engineering services are not available (for example, we would not be able to specify the exact pump design for a specific location.)

3. Pump Efficiency Tests – Subsidized tests are available for eligible electric or natural gas-powered water pumps that are 25 horsepower or greater.

4. Incentives for Pump Retrofits/Replacements – incentives are available **for any size pump** to encourage individuals to retrofit/replace eligible, electric or natural gas-powered water pumps to improve overall pumping efficiency.

IMPORTANT! Agricultural customers with pumps of 25 horsepower or less who are planning to retrofit, or have already retrofitted, with the project commencing on or after August 1, 2014, may be eligible to participate in the PG&E rebate measure "Agricultural Irrigation Pump Overhaul (<= 25 HP)". Go to PG&E's web site (www.pge.com/ag), call their Agricultural Customer Service Center at 1-877-311-3276, or your account representative for more information. This measure has a simpler application procedure, including no requirement for pre-project or post-project pump efficiency tests, and the rebate is calculated differently.

IV. Who is Eligible to Participate?

Eligibility extends to all owners or users of a non-residential, PG&E electric or natural gas utility account that is primarily used for pumping water for production agriculture, landscape or turf irrigation, or municipal purposes, including potable and tertiary-treated (reclaimed) water but excluding pumps used for industrial processes, raw sewage, or secondary-treated sewage, and who are paying the Public Purpose Programs Charge. Customers should call APEP first if there is a question concerning their eligibility.

IMPORTANT!

Other factors may apply for individual pump retrofit projects or pump efficiency tests. Carefully read this Policies and Procedures Manual, especially sections VII. and VIII., or contact the APEP Program Office for full eligibility criteria.

V. How Can I Participate?

The following summarizes how individuals can participate in the various APEP activities:

1. Educational seminars - Anyone is welcome to attend the educational seminars. Notices of upcoming seminar dates and locations will be found in agricultural trade publications, on the APEP web site (www.pumpefficiency.org), in local newspapers, and heard on radio and television.

2. Technical Assistance – Available to any eligible participant. Personnel will be available at all educational seminars, at the APEP offices (see section VI. below), and at various other times and locations.

3. Pump Tests – Subsidized pump efficiency tests are available to any eligible PG&E electric or natural gas account of 25 horsepower or more. Pump tests must be performed by one of APEP's participating pump test companies. All you have to do is contact the participating pump test company of your choice. A list of these companies is available from the APEP Program Office, or on the APEP web site at www.pumpefficiency.org.

   IMPORTANT!

   Please note that APEP provides the subsidy directly to the pump test company, not to you. This subsidy may or may not cover the total cost of the test. You should have a clear understanding of the total cost of a pump test, and whether you will be liable for any part of that cost, before you authorize a test.

4. Incentives for pump retrofit/replacement – Incentives are available to any eligible PG&E electric or natural gas account for retrofitting/replacing inefficient pumps. (However, if an agricultural customer with a pump of twenty-five horsepower or less, with a project commencing on or after August 1, 2014, you may need to apply to the PG&E rebate measure "Agricultural Irrigation Pump Overhaul (<= 25 HP)". Go to PG&E's web site (www.pge.com/ag) or call their Agricultural Customer Service Center at 1-877-311-3276 or your account representative for more information.) You need to fill out an application form and send it to the main APEP Program Office. The form may be obtained by contacting a regional APEP office or downloading the form from the APEP web site at www.pumpefficiency.org. Refer to section VIII. "More About the Pump Retrofit/Replacement Incentive" below.

VI. How Do I Contact APEP?

APEP maintains regional offices in the San Joaquin Valley, and the Central Coast. Specific questions regarding the activities of APEP can be answered by contacting one of these offices:

- Main Office – Central/Southern California – (800) 845-6038

- Central Coast (San Mateo County to Ventura County) – (805) 619-7506

APEP also maintains a web site at www.pumpefficiency.org. Here you will find summaries of all Program components, a calendar of upcoming events, a list of participating pump test companies, incentive application

forms, phone numbers and E-mail addresses of the regional offices, and a knowledge-base to help you conserve energy and water.

VII. More About Pump Efficiency Tests

All you have to do is contact the participating pump test company of your choice. The results of the test are reported to APEP and PG&E. The results of the pump test will include a calculation of the kilowatt hours or therms needed to pump an acre-foot of water, the overall pumping efficiency, motor loading, power input to the pumping plant, and the estimated energy and dollar savings resulting from a pump retrofit/replacement. A sample report is seen in Figures 1a and 1b.

The knowledge-base on the APEP web site contains a full explanation of the pump test report and how to use the results. A pamphlet is also available from APEP. You can call one of the regional offices or download this pamphlet from the web site.

CONFIDENTIAL AND PROPRIETARY INFORMATION PUMPING COST ANALYSIS FROM: Adv Pumping Efficiency Program

DAVID ZOLDOSKE
CSU FRESNO
5370 NORTH CHESTNUT AVE.
FRESNO, CA 93740

Test Date: 6/6/2012
Pump TEST0709
Nameplate HP: 150.0
Our Pump Test 300334

This is a water well used for Irrigation - Agriculture and assumed to be operated 1000 hours/year.

The following Pumping Cost Analysis is presented as an estimate prepared from data acquired from the pump test performed 6/6/2012 and information provided by you. Please pay careful attention to the assumptions. The estimated savings are only valid for the assumptions made and conditions measured during the pump test. Note that many numbers are rounded during calculations.

*NOTE: * denotes a value that was assumed or provided by Customer*

	Measured Pump Condition	Assumed Condition After Retrofit	Notes
1. **Overall pumping efficiency:**	35 %	69 %	
2. Nameplate Horsepower:	150.0 hp	150.0 hp	
3. Motor Efficiency:	92 %	92 %	
4. Actual Motor Input Horsepower:	147.5 hp	158.0 hp	
5. Motor loaded at:	90 %	97 %	
6. Flow rate (gpm):	800 gpm	1,481 gpm	
7. Pumping Level (ft):	250 ft	280 ft	
8. Discharge Pressure (psi):	1 psi	5 psi	
9. Total Dynamic Head (feet):	252 ft	291 ft	*Rounded TDH = line 7. + (2.31 x line 8.)*
10. Acre-feet Pumped/yr:	147.30 af/yr*	147.30 af/yr*	*Same af/yr AFTER*
11. Average Cost per kWh:	$0.140 /kWh*	$0.140 /kWh*	*Same $/kWh AFTER*
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	110,000 kWh/yr	63,638 kWh/yr	46,362 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	540 hr/yr	460 hr/yr
14. Kilowatt-hours per acre-	747 kWh/af	432 kWh/af	315 kWh/af
15. Average Cost Per acre-foot:	$104.55 /af	$60.49 /af	$44.06/af = 42.15%

- Estimated savings = $44.06/af = 42.15% of energy costs
- If pumping 147.30 af/year this equals about $6,491 annual savings

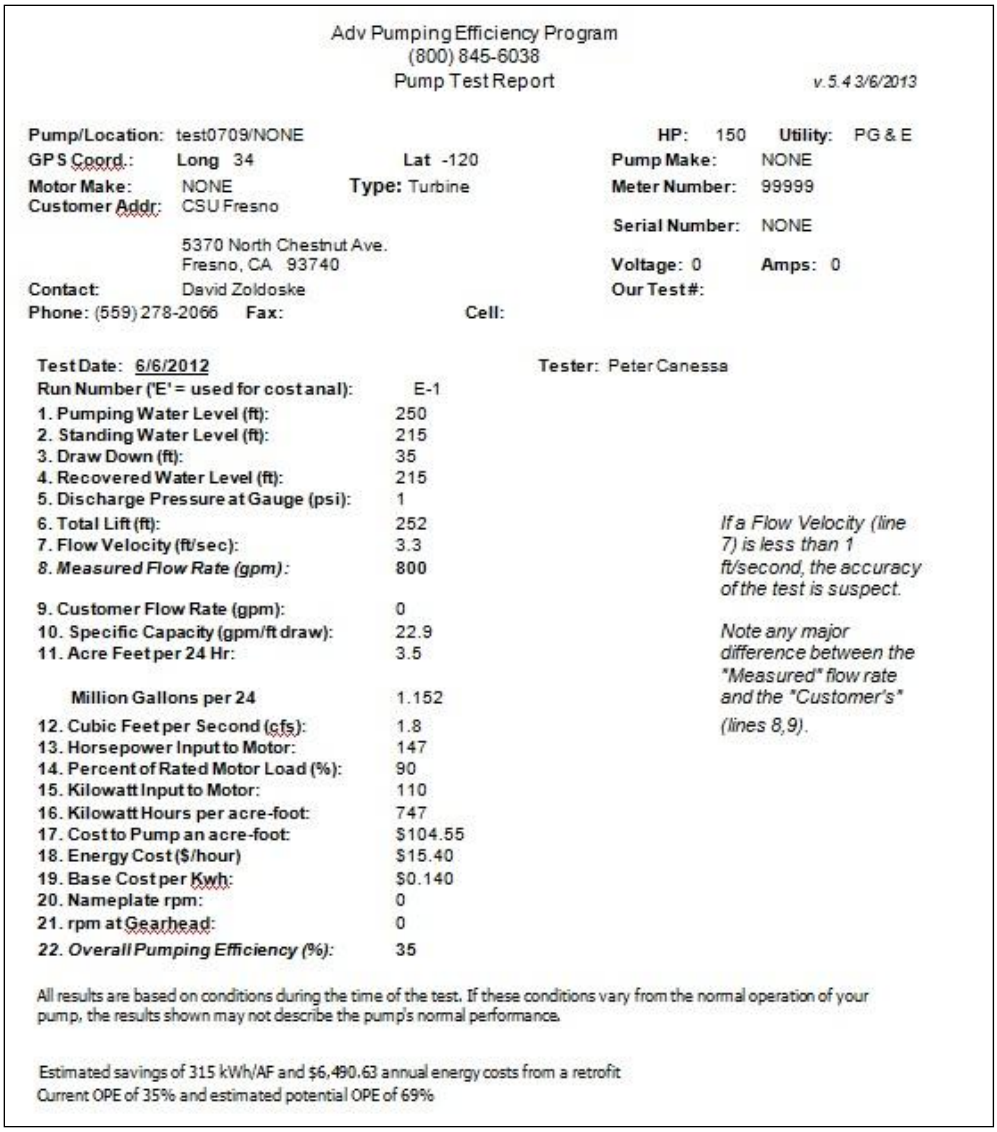
Analysis Remarks:

It is sincerely hoped that this information will prove helpful to you, and that your concerns over maintaining optimum pumping efficiency will continue. If you have any questions, please contact Peter Canessa at 8008456038.

Regards,

Peter Canessa

Figure 1a – Sample pumping cost analysis from a pump efficiency test report (report format may be modified at any time).



Adv Pumping Efficiency Program
(800) 845-6038
Pump Test Report
v.5.4 3/6/2013

Pump/Location: test0709/NONE **HP:** 150 **Utility:** PG & E
GPS Coord.: **Long** 34 **Lat** -120 **Pump Make:** NONE
Motor Make: NONE **Type:** Turbine **Meter Number:** 99999
Customer Addr: CSU Fresno **Serial Number:** NONE
5370 North Chestnut Ave.
Fresno, CA 93740 **Voltage:** 0 **Amps:** 0
Contact: David Zoldoske **Our Test#:**
Phone: (559) 278-2066 **Fax:** **Cell:**

Test Date: 6/6/2012 **Tester:** Peter Canessa

Run Number ('E' = used for cost anal):	E-1
1. Pumping Water Level (ft):	250
2. Standing Water Level (ft):	215
3. Draw Down (ft):	35
4. Recovered Water Level (ft):	215
5. Discharge Pressure at Gauge (psi):	1
6. Total Lift (ft):	252
7. Flow Velocity (ft/sec):	3.3
8. Measured Flow Rate (gpm):	**800**
9. Customer Flow Rate (gpm):	0
10. Specific Capacity (gpm/ft draw):	22.9
11. Acre Feet per 24 Hr:	3.5
Million Gallons per 24	1.152
12. Cubic Feet per Second (cfs):	1.8
13. Horsepower Input to Motor:	147
14. Percent of Rated Motor Load (%):	90
15. Kilowatt Input to Motor:	110
16. Kilowatt Hours per acre-foot:	747
17. Cost to Pump an acre-foot:	$104.55
18. Energy Cost ($/hour)	$15.40
19. Base Cost per Kwh:	$0.140
20. Nameplate rpm:	0
21. rpm at Gearhead:	0
22. Overall Pumping Efficiency (%):	**35**

If a Flow Velocity (line 7) is less than 1 ft/second, the accuracy of the test is suspect.

Note any major difference between the "Measured" flow rate and the "Customer's" (lines 8,9).

All results are based on conditions during the time of the test. If these conditions vary from the normal operation of your pump, the results shown may not describe the pump's normal performance.

Estimated savings of 315 kWh/AF and $6,490.63 annual energy costs from a retrofit
Current OPE of 35% and estimated potential OPE of 69%

Figure 1b – Sample results and calculations from a pump efficiency test report (report format may be modified at any time).

IMPORTANT!
Please note the following:

- *The performance and results of the pump efficiency tests are the sole responsibility of the pump test company. Any agreement for pump testing that you enter into is a business arrangement solely between the pump testing company and you. Neither PG&E, APEP, the Center for Irrigation Technology, the California State University, Fresno Foundation, the California Public Utilities Commission, nor any other party guarantees the accuracy of the pump test, nor are any of the aforementioned parties guarantors of such company.*

- *APEP provides the subsidy directly to the pump test company for eligible pump tests, not to you. Currently the standard subsidy is $200/test for pumps not tested in the 47 months prior to the test date and $100/test for pumps not tested in the 23 months prior to the test date. The subsidy is $50/test for pumps that are in series with another pump (most commonly a booster pump being supplied by a water well).*

These subsidies may or may not cover the total cost of any one test. You should have a clear understanding of the total cost of a pump test, and whether you will be liable for any part of that cost, before you authorize a test.

- *Funding for pump tests is limited and is available on a first-come, first served basis. The subsidy and eligibility rules may change at any time based on budgetary constraints. Please contact the main APEP Program Office if you have questions about funding availability and eligibility.*

- *The subsidy may be disallowed for any of the eligibility issues listed below, EVEN IF THE TESTER OR YOURSELF WERE UNAWARE OF THE VIOLATION AT THE TIME OF THE TEST.*

Pump Test Eligibility Rules:

- The pump test must be for the purpose of determining current overall pumping efficiency (OPE).

- Only one subsidized test is allowed per pump in a 23 month period.

- You will have to sign an Access Agreement (see Appendix A) before the test so that the pump tester has legal access to your property. You will have to sign a Record of Test (see Appendix B) after the test so that there is proof a test was performed for you.

- Subsidized pump tests are not available for any purpose related to:
  - A real estate transaction (e.g., determine flow, pumping water level, water quality).
  - Satisfaction of a mandate of any federal, state, or local government or quasi-political agency (participants in PG&E's AG-ICE program are specifically eligible for all parts of APEP).

- Subsidized pump tests are not available for the following conditions:
  - A pump which is in the APEP database already which was previously tested at 30% OPE or less for electric pumps, 20% OPE or less for a submersible pump, and 6% OPE or less for a natural gas-powered pump, *unless that pump was retrofitted in the interim.*
  - Water wells or any other pump where the true total dynamic head cannot be determined. APEP requires that a subsidized pump test be able to calculate overall pumping efficiency (OPE).
  - Any pump powered by less than 25 horsepower as listed on the motor/engine nameplate.
  - A test that results in a flow velocity of less than one foot-per-second in the pipe section used for flow measurement.
  - In the case of an electric-powered pump, a test where the load of the pump cannot be isolated at the meter and a True RMS Power Meter is not used to measure input power.
  - A test that is not performed to accepted industry requirements, standards, and practices as exemplified by those tests currently performed by the Southern California Edison Company or formally by the Pacific Gas and Electric Company, and as described in Appendix D.

VIII. More About the Incentive for Pump Retrofit/Replacement

IMPORTANT!

APEP requires a pump efficiency test be performed prior to and after the retrofit project. They do not have to be done by APEP testers but they must be considered accurate by APEP. These tests cannot be more than three (3) years apart. APEP can accept applications for retrofit incentives after the project is completed but the application must be completed within two (2) years after the post-project test. This includes submittal of copies of the pre- and post-project pump tests, invoices, the completed and signed application form, and the completed and signed Certificate of Completion.

Work can be contracted or performed wholly or partially in-house if such capability exists. However, in-house labor rates and other costs cannot exceed the average of rates and costs charged by the two closest commercial pump service contractors.

Incentives from APEP cannot be combined with other utility grant, rebate, or service programs, or with grants, rebates or services offered by any other state or local government agency for the same measure.

If the project involves an agricultural pump of twenty-five horsepower or less and the project commenced on or after August 1, 2014, it may be processed under the PG&E Standard Agricultural Rebate Program. Call the Agricultural Customer Service Center at 1-877-311-3276 or APEP for more information.

Eligible projects must satisfy the following criteria:

- The pump must be operational at the time of retrofit. APEP will not provide an incentive for an inoperable pump.

- The specific work must include:
  - replacement of either or both of the pump bowl and impeller or,
  - machine work (e.g., re-facing, pit and hole filling) to return either or both of the pump bowl and impeller to original condition or,
  - trimming impellers to better match required operating conditions.

- Only one pump, with one discharge point, is eligible per application. (A well with a booster pump located at the well, and in series with the well, is an eligible pumping system for retrofit of either the well or the booster pump. However, call the APEP Main Office for details regarding these types of projects.)

- Only one incentive per individual pump will be paid in any one six-year period.

Examples of ineligible projects include:

- Projects involving multiple pumps, at different locations or on different meters.

- Retrofit or replacement of an electric motor only or installation of a variable frequency drive.

- Retrofits required in respond to the need to change the operating condition or use of the pump in any way. Examples of this would include a) changing a well pump from low pressure flood irrigation to high pressure drip irrigation, b) increasing the capacity of a pump due to added irrigated acreage or a change in a municipal water system's operating requirements.

IMPORTANT!
If there is a question as to whether a project would be eligible due to the above restriction regarding intent then you should call APEP before starting the project or submitting an application.

- Construction or finishing of a new water well.

- Pump impeller adjustments only.

- Well rehabilitation only, including chemical treatment, cleaning, swaging, or patching.

- Projects intended only to reduce total dynamic head.

- Pump disassembly, inspection, and cleaning only (no machine work).

- Projects involving retrofit or repair of the tube, shaft, and/or column only.

- Bearing or spider replacement only.

- Projects involving a switch from diesel power to electric or natural gas power.

Projects involving a change in nameplate horsepower are potentially eligible but the purpose of the horsepower change cannot be:

- To irrigate more area.
- To accommodate a change in distribution system design or operating requirements.
- To consolidate operations of two or more pumps (unless a directly-connected well/booster combination that are both electric-powered).
- To change the type of irrigation system (e.g., change from furrow irrigation to micro irrigation).
- Satisfy the conditions of a real estate sale, lease, or transfer.
- Satisfy the conditions of a water sale, lease, or transfer.

Projects involving the consolidation of a directly connected well/booster combination into a single pressurized well are eligible projects and would be considered as a single application. However, pre-project pump tests for both the well and the booster when running together need to be submitted. Absent supplemental information*, the discharge pressure of the post-project pump test should be within +/- 10% of the discharge pressure of the pre-test of the booster pump. (For example, if the pre-test shows 30 psi discharge pressure for the booster pump, the post-project pump test ideally would be performed with 27 - 33 psi discharge pressure.) In addition, for purposes of the incentive calculation: 1) the change in the total of the two pumps' kWh/AF versus the kWh/AF of the single pressurized well will be the basis for any kWh savings, 2) the total of the two pumps' nameplate horsepower will be the basis for any kW demand savings.

> * Some examples of "supplemental information" would be a) that water filters were in poor condition at the time of the pre-test and were subsequently replaced at the time of retrofit, thus altering the required discharge pressure, b) throttling valves were removed at the time of retrofit, thus altering the required discharge pressure, c) water tables have fallen dramatically since the pre-test, d) different irrigation sets were running during the post-test, or e) increased flow from the retrofitted pump resulted in higher pressure in the irrigation system.

If your project is ineligible for APEP, please note that PG&E has many other energy efficiency programs including the Savings By Design program for new construction projects and the Customized program for installation of energy efficient equipment or systems in existing facilities. Go on line to www.pge.com or call your account representative for more information.

IMPORTANT!
Any agreement for pump retrofit/replacement service work that you enter into is a business arrangement solely between you and the pump service provider. Neither PG&E, APEP, the Center for Irrigation Technology, the California State University, Fresno Foundation, the California Public Utilities Commission, nor any other party is responsible for guaranteeing the services of such pump service provider.

IX. Important Time Limits on Applications Approval and Project Completion

There are some important time limitations to be aware of:

- Applicants have two (2) years from the date of the post-project pump test to complete the application, including all required paperwork. If a) applications are not completed within this timeframe, or b) APEP ends, or c) California Public Utility Commission funds for APEP are unavailable or otherwise inaccessible to APEP or PG&E, the application will expire and no incentives will be paid.

- Currently, an application (consisting at a minimum of a signed application form and copy of the pre-project pump efficiency test) must be received by APEP by close of business November 15, 2017 to be eligible under the current program cycle. The cutoff date for a completed project and application package, including the Certificate of Completion, copies of work invoices, and the post-retrofit pump test, is December 31, 2017.

X. How Are Incentives Calculated?

IMPORTANT!
In consultation with you, APEP staff will perform all incentive calculations if so desired. APEP staff will always double-check all calculations as part of the approval process.

Incentives are calculated based on estimated first-year project energy savings (kilowatt-hours or therms) and (if an electric account) kilowatt demand savings and are capped at 50% of the project implementation cost.

The energy savings component (kWh RATE in the equations below) for electric accounts will be determined using an incentive rate of either $0.08/kWh saved , $0.09/kWh saved or $.12/kWh saved. A rate of $.09/kWh saved will be used if the application was signed after December 31, 2008 and before May 15, 2014 and the project was physically started after December 31, 2008. A rate of $.12/kWh will be used if the application was signed and received by APEP on or after May 15, 2014 and before March 31, 2017. An application signed and received by APEP after March 31, 2017 will use a rate of $.08/kWh.

The kilowatt demand savings component (kW RATE in the equations below) will be calculated at the rate of $100/kW or $150/kW. However, no demand savings will be credited for projects started or applications signed before 1/1/2011, or for projects started or applications signed after 1/19/2016. The rate will be $100/kW for applications signed before July 1, 2014 otherwise it will be $150/kW.

The energy savings component for natural gas accounts (RATE in the equations below) will be determined using an incentive rate of $1.00/therm saved.

IMPORTANT!
In the equations below, Annual kWh/Annual Therm is generally the kWh/Therm usage in the last fully operational calendar year prior to the start of the project. However, APEP at its full discretion, may use the kWh/Therm usage in a different calendar year or years, or other twelve-month cycle if such usage is a more representative figure. In the event that the Applicant has cogeneration or self-generation facilities note that PG&E shall not pay Incentives for energy savings that exceed Applicant's annual energy usage from PG&E. Energy and demand savings are limited to the Annual kW and kWh/Therm purchased from or delivered by the utility on the meter(s) serving the equipment to be installed, for which the utility collects the Public Purpose Programs (PPP) charge. The Annual kW and kWh/Therm include usage from Standby Service and less savings associated with pending energy efficiency applications.*

> **The term "fully operational calendar year" implies a calendar year where the annual billing captures a pump available for normal operation. Examples of interpretation are:*
>
> > *- for a water agency pump where billing for prior years is consistent and shows use in all twelve months- we would use the calendar year prior to the start of the project as long as that year showed normal use. However, if, for example, the prior year shows use only for part of the year, indicating that the pump was out of service waiting for retrofit, then we may go back further in history.*
> >
> > *- for an agricultural pump where billing for prior years is consistent but shows use only in the meter readings for part of the year (for example, usage is seen only in the months April through August, which might be some farm's normal irrigation season) - we would use the current year's billing if the project started after the August reading, and the prior year's*

billing if the project started before or during the August reading. We might deviate from this if the customer provided a statement indicating that there was minimal use of the pump, even though use in every month, because of the low efficiency.

An example of where we might use the average of two or more calendar years would be an agricultural pump whose operation was dependent on the various types of water supplies available to the farm and whose billing history is erratic, i.e., high use in some years, low use in others. In this case we would use an average of two or more years.

An example of where we might use a twelve month period other than a calendar year is a new installation or a change of ownership where there is not a prior calendar year of billing available. In that case we might use the twelve months (or whatever billing was available) immediately prior to the project start.

All of the above examples are predicated on the effort by APEP to use a "representative" annual usage that is fair to both the customer and the utility ratepayers funding this program.

IMPORTANT!
APEP reserves the right to audit the post-retrofit pump test at its discretion using an independent pump tester. APEP also reserves the right to use the kilowatt hours, or therms if a natural gas-powered pump, required to pump an acre-foot of water through the system and the normal amount of water pumped per year as the basis for the potential incentive calculation if OPE cannot be measured with a pump test.

Project Costs: Project costs must be estimated, and the actual costs documented when available, with an APEP Application. Project costs can include time (diagnostics, engineering, or labor) and materials directly involved in completing the retrofit of the pump bowl and/or impeller. APEP will specifically not count the costs of a motor or engine replacement or overhaul, gear drive overhaul, motor control replacement, or installation of a variable speed drive as part of the project cost for the purposes of calculating your incentive.

Calculation Methods: There are two standard methodologies used for determining the incentive for a pump retrofit/replacement based on energy savings.

Method 1 – Method 1 should be used for electric and natural gas-powered pumps in these situations:

- It is always used for an electric-powered pump when the pre-retrofit pump efficiency test shows an overall pumping efficiency of 50% or less (40% or less if a submersible pump).
- It is always used for natural gas-powered pumps when the pre-retrofit pump efficiency test shows an overall pumping efficiency of 16% or less.

For electric-powered pumping plants the potential incentive is calculated as:

$$\text{Incentive} = (.25 \times kWh_{annual} \times \text{kWh RATE}) + (\text{kW SAVE RATE} \times \text{kW RATE} \times \text{PUMP HP})$$

Where:

KWh_{annual} = 12 months of energy use as defined above

kWh RATE = $.08, $.09, or $.12/kWh depending on when the application was signed and/or the project started as explained above

kW SAVE RATE = 0.0 if the project was started or the application signed before January 1, 2011; if started and the application signed after January 1, 2011, it will be .07159 for agricultural or turf irrigation pumps and .05966 for all other pumps (Municipal, District, Agency, Water Company, etc.)

kW RATE = 0, $100/kW, or $150/kW as explained above.

PUMP HP = the nameplate motor horsepower before the retrofit project

For natural gas-powered pumping plants the potential incentive is calculated as:

Incentive = .25 x $therm_{annual}$ x RATE

Where:
$therm_{annual}$ = 12 months of energy use as defined above

RATE = $1.00

Method 2 – This method is used for pumps in the following situations:

- If an electric-powered pump and the pre-retrofit pump efficiency test shows an overall pumping efficiency greater than 50% (greater than 40% for submersible pumps).
- If a natural gas-powered pump and the pre-retrofit pump efficiency test shows an overall pumping efficiency greater than 16%.

As in Method 1 there are both energy savings and demand savings components of the incentive. The potential energy savings component of the incentive for an electric-powered pump is calculated as:

EIncentive = kWh RATE x (kWh_{annual} – (kWh_{annual} x pre-retrofit OPE / post-retrofit OPE))

Where:
KWh_{annual} = 12 months of energy use

OPE = Overall Pumping Efficiency as tested before (pre-) and after (post-) the project.

kWh RATE = $.08, $.09, or $.12/kWh depending on when the application was signed and/or the project started as explained above.

The demand savings component of the incentive is calculated as:

DIncentive = kW RATE X kW SAVE RATE X PUMP HP

Where:
kW SAVE RATE = 0.0 if the project was started or the application signed before January 1, 2011 or after January 19, 2016; if started and the application signed after January 1, 2011and before January 20, 2016, it will be determined as below

kW RATE = 0, $100/kW, or $150/kW as explained above.

PUMP HP = the nameplate motor horsepower before the retrofit project

The kW SAVINGS RATE for agricultural and turf irrigation pumps is found by using Table 1 and the Estimated kWh Savings percentage.

Estimated kWh Savings % = 100 x (1 – (Pre-Project OPE / Post-Project OPE))

Table 1 – kW SAVE RATE for Ag and Turf Irrigation Pumps at Different kWh Savings Percentages

Estimated kWh Savings %	kW SAVE RATE

5%	.009694
10%	.02237
15%	.03729
20%	.05369
25%	.07159
30%	.08874
35%	.1044
40%	.1163
45%	.1260
50%	.1320
55%	.1357
60% and above	.184

The kWSAVE RATE for all other pumps is found by using the following equation:

kW SAVE RATE = .2386 x (1 – (Pre-Project OPE / Post-Project OPE))

The potential incentive for a natural gas-powered pump is calculated as:

Incentive = kW RATE x ($therm_{annual}$ – ($therm_{annual}$ x pre-retrofit OPE / post-retrofit OPE))

Where:

$Therm_{annual}$ = 12 months of energy use

OPE = Overall Pumping Efficiency as tested before and after the project.

kW RATE = $1.00

The following are requirements for post-retrofit pump efficiency tests when using Method 2. Note that APEP reserves the right to audit the post-retrofit test using an independent pump test company:

- If a water well, the pump tests must be at similar discharge pressures (+/- 5 psi of the pre-retrofit discharge pressure) and with a similar standing water level (+/- 10% of the pre-retrofit level).
- If a booster pump, either a) the same pump and impeller trim (if applicable) must be in place before and after the retrofit or b) the tests are at the same operating condition (+/- 10% of pre-retrofit flow and total dynamic head).

These requirements may be modified if supplemental information is provided regarding the installation. Examples would include a) that water filters were in poor condition at the time of the pre-test and were subsequently replaced at the time of retrofit, thus altering the required discharge pressure, b) throttling valves were removed at the time of retrofit, thus altering the required discharge pressure, c) water tables have fallen dramatically since the pre-test, d) different irrigation sets were running during the post-test, or e) increased flow from the retrofitted pump resulted in higher pressure in the irrigation system.

XI. Examples of Pump Retrofit/Replacement Incentive Calculations

Example A:
Assume the following for an irrigation pump:

- Pre-retrofit OPE is tested at 52%.
- Post-retrofit OPE is tested at 62%.

- Billing data indicates 70,000 kilowatt hours were used in the calendar year prior to the replacement/retrofit.
- The replacement costs $1,500 and was started April 12. 2014..
- The nameplate motor horsepower is 75 HP.

The project started April 12, 2014 and the application was signed before May 1, 2014, thus:

- kWh RATE = $.09/kWh
- kW RATE = $100

The maximum Potential Incentive due to the project cost is:

Potential Incentive (maximum) = .5 X $1,500 = $750

Method 2 must be used since the pre-retrofit test results show an OPE of 52%. The Potential Incentive is initially calculated as (note that there is no demand savings component):

EIncentive = kWh RATE x (kWh_{annual} – (kWh_{annual} x pre-retrofit OPE / post-retrofit OPE))
EIncentive = .09 x (70,000 – (70,000 x 52/ 62)) = $1,016.13

(Note that the calculations in the equation proceed as follows:

1. Divide 52 by 62;
2. Then multiply the result by 70,000
3. Then subtract the result from 70,000
4. Then multiply the result by .09

Depending on how you round the numbers during the calculations you will get an answer of more or less $1,016.)

DIncentive = kW RATE X kW SAVE RATE X PUMP HP

The kW SAVE RATE is found in Table 1. There are 16% kWh savings and thus, the kW SAVE RATE is .04057 and the kW incentive is:

DIncentive = 100 x .4057 x 75 = $304.28

The total kWh/kW savings incentive is $1,320.41.

However, since $750 (50% of the project cost) is the maximum allowable payment, the Potential Incentive is $750.

Example B:
Assume the following for an irrigation pump:

- Pre-retrofit pumping efficiency is tested at 52%.
- Post-retrofit pumping efficiency is tested at 62%.
- Billing data indicates 70,000 kilowatt hours were used in the calendar year prior to the retrofit/replacement.

- The replacement costs $4,000 and the project started 1/15/2011.
- The nameplate motor horsepower is 75 HP.

The project started after 1/1/2009, thus:

- kWh RATE = $.09/kWh
- kW RATE will depend on the kWh savings

The maximum Potential Incentive due to the project cost is:

Potential Incentive (maximum) = .5 X $4,000 = $2,000

Method 2 must again be used and the energy savings component of the Potential Incentive is initially calculated as:

EIncentive = kWhRATE x (kWh_{annual} – (kWh_{annual} x pre-retrofit OPE / post-retrofit OPE))
EIncentive = .09 x (70,000 – (70,000 x 52/ 62)) = $1,016.13

To calculate the demand savings component of the Potential Incentive, the energy savings are first calculated as:

kWh savings = (70,000 – (70,000 x 52/ 62)) = 11,290 kWh

As a percentage this is:

kWh savings % = 100 * 11,290 / 70,000 = 16%

Prorating between the KW SAVE RATE for 15% and 20% in Table 1 it is seen that the kW SAVE RATE is .04057. Thus, the demand savings component of the incentive is calculated as:

DIncentive = $100/kW X kW SAVINGS RATE X PUMP HP
DIncentive = $100 X .04057 X 75 = $304.28

Thus, the total Potential Incentive due to energy and demand savings equals:

Incentive (total) = $1,016.13 + $304.28 = $1,320.41

Since this is less than the maximum incentive permissible due to the 50% project cost cap, the Potential Incentive is $1,320.41.

The above examples indicate that calculating a Potential Incentive can be complicated. APEP staff, in consultation with you, will perform all calculations, both to estimate your Potential Incentive before starting a retrofit project and after it is finished and the actual results are available.

XII. How Do I Apply for a Pump Retrofit/Replacement Incentive?

1. Obtain an Application form. Call your PG&E account representative, call one of APEP's offices, or log on to the APEP web site at www.pumpefficiency.org. Your pump repair company or pump test company may also have applications for distribution.

2. Read Sections I., II., and III. Fill out Section IV., the Agreement, completely. Read all statements in Section IV.4 carefully, especially clause 7 where your initials are required. By signing this Agreement you are certifying that these statements are true. **YOU ARE NOT COMMITTING TO**

COMPLETING THE PUMP RETROFIT BY SIGNING THE APPLICATION! The application is only an agreement regarding the incentive that might be paid to you. Chapter XIV. of this document contains a copy of the Agreement.

3. Complete Section V. Calculation of Potential Incentive. APEP, in consultation with you, will perform all calculations if you wish.

4. Fill out Section VI. Project Description as much as possible.

5. Keep the Certificate of Completion.

6. Make a copy of the application and supporting documentation for your records and mail or fax the following to the Advanced Pumping Efficiency Program:

    a. The original Sections IV., V. and VI. of the Application.

    b. Copy of a pump efficiency test performed prior to the start of the project. The testing company does not have to be an APEP participating pump test company but the test must be deemed accurate by APEP.

7. We will notify you of Application acceptance or the need for more information.

8. If the Application is accepted, and when the project is complete, paid for, and the post-retrofit pump test completed, mail the following to APEP:

    a. The Certificate of Completion, including the start and finish dates of the project.

    b. Copies of invoices marked PAID by the pump service company, or copies of cancelled checks along with invoices.

    c. Copy of the post-retrofit pump efficiency test performed no more than three (3) years after the pre-project pump test.

IMPORTANT!
The documentation of Annual energy use must be copies of utility bills or a summary of energy use prepared by the utility. If you cannot find the correct calendar year's bills showing energy usage, call your local PG&E account representative, visit www.pge.com, call the PG&E Business Customer Service Center at 1-800-468-4743 to obtain a record, or call the APEP main office at 1-800-845-6038.

IMPORTANT!
The invoices must clearly state all eligible work that was performed, including replacement of parts, labor, and diagnostics. If a new pump is installed (or in the case where this information is known), the pump make, model, and number of stages must be identified.

All material should be mailed to:

Advanced Pumping Efficiency Program
Center for Irrigation Technology
6014 North Cedar
Fresno, CA 93710

XIII. How Do I Register a Complaint?

Participants in the Advanced Pumping Efficiency Program who have complaints of any form can submit these complaints in the following manner:

1. The first step is to file the complaint with the main APEP Program Office by calling toll free 1 (800) 845-6038 and notifying APEP that you would like to file a complaint. The APEP representative will document your complaint and APEP personnel will respond to the complaint in five (5) working days. There is also a feedback form on the web site at www.pumpefficiency.org where an e-mail message can be sent to APEP that is specifically marked as a complaint.

2. If you do not hear from APEP within five working days, or are not satisfied with APEP's response, you may submit your complaint to Pacific Gas and Electric Company by e-mailing your complaint to Colleen Breitenstein at c6bd@pge.com or by mailing a letter of Complaint to Colleen Breitenstein, Agricultural and Food Processing, Mail Code N6G, PG&E, P.O. Box 770000, San Francisco, CA 94177.

3. If you are not satisfied with the response from either or both of APEP or Pacific Gas and Electric Company you can submit your complaint directly to the Public Utilities Commission by calling 1-800-649-7570, Monday – Friday, 8:30 AM - 3:00 PM, by mailing a letter of Complaint to California Public Utilities Commission, Consumer Affairs Branch, 505 Van Ness Avenue, San Francisco, CA 94102-3298, or by filing an online complaint by going to http://www.cpuc.ca.gov/static/forms/complaints/filecomplaint.htm

APPENDIX A - Site Access Agreement that must be signed before a subsidized pump test can be performed. Note that only one Agreement has to be signed in order to cover all pumps within a contiguous farm.

SITE ACCESS AGREEMENT (v. 5/19/2014)

INTRODUCTION

This agreement is between [the pump test company's name] ("COMPANY") and

_____
(Owner/Manager/Tenant, or "Owner").

As used throughout this document, COMPANY and Owner are individually referred to as "Party" and collectively as "Parties". PG&E and the Advanced Pumping Efficiency Program operated by California State University, Fresno Foundation ("CSUFF") have the objective of maintaining and improving pumping plant performance and reducing overall pumping energy use. A means to achieving this objective is testing water pumps for efficiency ("Project"). This Project is funded through a Public Purpose Program Charge paid by California utility ratepayers. These monies are managed under the auspices of the CPUC and PG&E. While CSUFF program staff and the staff of the COMPANY will be compensated through these monies, neither CSUFF program staff nor the staff of the COMPANY are employees or representatives of the CPUC or of PG&E.

Owner grants access to the location described below ("Facility").

_____.

The Owner agrees to grant COMPANY access to that Facility for the purposes of this Project.

COMPANY is receiving funds from PG&E and CSUFF for this Project, but Parties agree that neither PG&E, nor CSUFF, State of California, Trustees of the California State University, California State University, Fresno are liable to either Party for any losses, claims or damages, including incidental, special or consequential losses, claims or damages, in any way arising from or out of this Agreement. The Parties agree that PG&E, CSUFF, the State of California, the Trustees of the California State University, and the California State University, Fresno are third party beneficiaries of this agreement for purposes of enforcing the provisions of this paragraph.

The following terms will govern this Project:

COMPANY AGREES:

1. **Owner Convenience.** To coordinate visits to the Facility with the Owner, so as to minimize any disruptions or inconvenience to the Owner.

2. **Installation.** To install, operate and maintain any test or monitoring Equipment necessary for the Project in a manner that is acceptable to the Owner.

3. **Costs.** To bear all of the actual costs associated with performing the Project, except to the extent that any testing must be paid by Owner if pumps are determined to be ineligible for any subsidy.

4. **Compliance with Laws.** To comply with all federal, state, and municipal laws, ordinances, rules, orders, and regulations, which apply to its actions at the Facility or to the Project.

5. **Confidentiality.** Not to use the names or identifying characteristics of the Owner or Owner's Facility for published project reports, advertising, sales promotion or other publicity without the Owner's written approval.

6. **Removal.** To remove the Equipment upon completion of the Project, and to leave the Facility in substantially the same condition it was prior to the Project.

OWNER AGREES:

7. **Permission.** To allow COMPANY, or its subcontractors, a representative from PG&E, and the California Public Utilities Commission (CPUC), if requested, reasonable access to Facility for purposes of the Project, including but not limited to monitoring, testing, inspecting and verifying.

8. **Access.** To permit COMPANY reasonable access to and egress from the Facility during normal business hours to carry out the work of this study, and to direct Owner's employees and contractors to cooperate with COMPANY in the conduct of this study.

9. **Equipment Ownership.** That Owner has no ownership, interest or title in the Equipment.

10. **Removal.** To permit removal of the Equipment at any time by COMPANY.

11. **Confidentiality.** Not to use the names or identifying characteristics of COMPANY or PG&E for any advertising, sales promotion or publicity of any kind without prior written approval by COMPANY.

12. **Certification.** That the pumps are eligible for the subsidy and that this test is not for the purposes of any real estate transaction or to satisfy the mandate of any governmental or quasi-governmental entity.

13. **Payment**. That Owner will pay the full cost of any tests should CSUFF determine that the pumps are not eligible for any subsidy.

BOTH PARTIES AGREE:

14. **Incidental and Consequential Damages**: NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES.

15. **Term of Agreement.** The term of this Agreement shall not exceed ____ month(s) without written agreement of both Parties. It is anticipated that the test period will be approximately ____ month(s) from installation of the Equipment.

16. **Termination.** Either Party shall have the right to terminate this Agreement at any time. In the event of termination, COMPANY shall be granted access to the Facility in order to remove the Equipment. Furthermore, the following provisions of this Agreement shall remain in full force and effect following termination of this Agreement: (i) use of names and ownership (clauses 5, 9, 11 and 17), as well as (ii) the provision found on page 1 specifying that neither PG&E nor CSUFF, State of California, Trustees of the California State University, California State University, Fresno are liable to either Party for any losses, claims or damages.

17. **Ownership of Information.** COMPANY may provide the Owner with information about its findings regarding this Project, but COMPANY shall have all ownership rights, including exclusive copyright ownership, in all data, reports, research results, summaries, information, or other written, recorded, photographic or visual materials (hereinafter "Information") produced and collected during the term of this agreement.

18. **General.** This Agreement shall be binding upon and inure to the benefit of any successors, transferees, heirs and assigns of the Parties. Except as otherwise specifically provided here in, nothing in this Agreement shall be construed to create any duty to, any standard of care with reference to, or any liability to any third party. This Agreement shall be construed and interpreted in accordance with the laws of the State of California, excluding any choice of law rules that may direct the application of laws of another jurisdiction.

19. **Entire Agreement.** This Agreement constitutes the entire agreement and understanding between the Parties as to the subject matter of the Agreement.

20. **If Tenant.** If the Facility is under lease, the Owner's tenant who controls the Facility, by executing this agreement, assumes the rights and obligations of the Owner hereunder.

AGREED AND ACCEPTED:

COMPANY	**CUSTOMER**
Signed: _____	Signed: _____
Name: _____	Name: _____
Title: _____	Title: _____
Address: _____	Address: _____
_____	_____
Email: _____	Email: _____
Phone: _____	Phone: _____
Date: _____	Date: _____

APPENDIX B - Record of Test to be signed by pump test company and customer to verify that the pump test was performed and the report given to the customer.

California consumers are not obligated to purchase any full fee service or other service not funded by this program. The Advanced Pumping Efficiency Program is funded by California utility ratepayers under the auspices of the California Public Utilities Commission.

Los consumidores en California no estan obligados a comprar servicios completos o adicionales que no esten cubiertos bajo este programa. Este programa esta financiado por los usuarios de servicios públicos en California bajo la jurisdiccion de la Comisión de Servicios Públicos de California.

Record of Pump Efficiency Test

It is the sole responsibility of the pump test company to have this form completed and then submit it to the APEP Program in order to receive the pump test subsidy.

Pump Tester - Please fill out this section of the form **Company: Adv Pumping Efficiency Program**

I certify that I performed test # 300334 on 6/6/2012 on the pump serviced by meter: PG & E 99999

Pump Name: test0709 Tester: Peter Canessa Signed:

Pump Owner/Operator - Please fill out this section of the form

I certify that this pump efficiency test was not for the purposes of a real estate transaction or to fulfill requirements of any government or quasi-government agency. I further certify that I have legal authority over the operation of this pump.

I was given a record of the pump test containing all measured data and the calculated Overall Pumping Efficiency and kiloWatt-hours (or therms) required to pump an acre-foot of water. I am aware that the test information and a picture of the test section will be sent to APEP and PG&E. I am also aware that APEP is providing a subsidy to the pump tester for eligible pumps.

Name (print): David Zoldoske

Title: Business: CSU Fresno

Signed: Date: Phone: 5592782066

APPENDIX C - Agreement that you will sign as part of the application process. By signing this agreement you are certifying that all statements are true. YOU ARE NOT COMMITTING TO COMPLETING THE RETROFIT BY SIGNING THIS AGREEMENT! It is only an agreement regarding the incentive that might be paid to you and the stipulations regarding that payment. There are 21 clauses in the Agreement.

The following is an Agreement between PACIFIC GAS and ELECTRIC COMPANY ("PG&E") and you, the "APPLICANT".

I, the Applicant, agree to the following terms and conditions:

1. I have read and understand Sections I., II., and III. of this Application. I have read and understand the Policies and Procedures Manual of the Advanced Pumping Efficiency Program ("Program") operating in the PG&E territory, especially those parts pertaining to the application for, and calculation of, the incentive for a pump retrofit/replacement. I am an eligible Applicant, and this is an eligible pump retrofit/replacement project under the terms of the Program. I plan to purchase and install the equipment indicated in Section VI. of this Application. This will be for use at my place of business and not for resale.

2. If a tenant, Applicant is responsible for obtaining the property owner's permission to install the Measure(s) for which Applicant is applying for an Incentive payment. Applicant's signature on this Application indicates Applicant has obtained this permission.

3. The information I have supplied and included with this Application is true, correct, and complete.

4. If my application is deemed to be incomplete or incorrect by the Program, I agree to supply additional information or application corrections within three (3) months from the date of application. I understand that if I do not supply the information or corrections within this time period, the application shall be deemed expired and PG&E shall not have an obligation to the Applicant.

5. I agree that an approved Application shall expire and no incentive paid if; a) the Application is not completed, including submittal of the Certificate of Project Completion and all supporting documentation to the Program within two (2) years of the post-project pump test or b) the Program ends or c) California Public Utility Commission funds for the Program are unavailable or otherwise inaccessible to the Program and PG&E.

6. I agree that the maximum incentive that I can receive is the Potential Incentive calculated in Section V. of this Application as of the date of Application approval.

7. _____ (your initials here) I certify that this pumping system, pump and power source was operational at the time of the retrofit/replacement. I further certify that this is solely to improve the operating efficiency of the pumping system and not for the purposes of substantially changing the intended operating condition of the pumping system, (e.g., from low pressure to high pressure operation or to substantially increase water flow). Further, If this project involves a change in the nameplate motor horsepower I certify that it is not being done in order to irrigate more area, accommodate a change in distribution system design or operating requirements, consolidate operations of two or more pumps (unless a directly-connected well/booster combination that are both electric-powered), change the type of irrigation system (e.g., change from furrow irrigation to micro irrigation), satisfy the conditions of a real estate sale, lease, or transfer, or to satisfy the conditions of a water sale, lease, or transfer.

8. I have read and understand the terms and conditions on this Application and agree to abide by the rules, requirements, and terms set forth on this Application.

9. If this Agreement is terminated for any reason, PG&E shall not be liable to the Applicant for damages or compensation of any kind.

10. I will supply documentation establishing paid proof-of-purchase. This will be done by attaching copies of all invoices marked "PAID" by the repair company to the Certificate of Project Completion and submitting the Certificate to the Program. I have attached documentation, or will supply documentation, establishing electricity use and pump performance as required by the terms of the Program.

11. PG&E reserves the right to determine the Applicant's eligibility for the Incentive program.

12. NEITHER PG&E NOR THE CALIFORNIA STATE UNIVERSITY, FRESNO FOUNDATION ("FOUNDATION") MAKES ANY REPRESENTATION OR WARRANTY, NOR ASSUMES ANY LIABILITY WITH RESPECT TO QUALITY, SAFETY, PERFORMANCE, OR OTHER ASPECT OF ANY DESIGN, SYSTEM OR EQUIPMENT INSTALLED OR REPAIRED PURSUANT TO THIS AGREEMENT, AND THEY EXPRESSLY DISCLAIM ANY SUCH REPRESENTATION, WARRANTY OR LIABILITY. APPLICANT AGREES TO INDEMNIFY PG&E, THE TRUSTEES OF THE CALIFORNIA STATE UNIVERSITY, THE FOUNDATION, CALIFORNIA STATE UNIVERSITY, FRESNO, AND ANY OF SAID ENTITIES' AFFILIATES, SUBSIDIARIES, PARENT COMPANY, OFFICERS, DIRECTORS, AGENTS, AND EMPLOYEES AGAINST ALL LOSS, DAMAGE, EXPENSE, FEES, COSTS, AND LIABILITY ARISING FROM ANY DESIGN OF SYSTEM OR EQUIPMENT INSTALLED.

13. Both funding and the conditions of the Incentive are subject to the jurisdiction of the California Public Utilities Commission (CPUC) and shall be subject to such changes or modifications as the CPUC may, from time to time, direct in the exercise of its regulatory authority. If there are changes in the Incentive, PG&E will endeavor, but cannot guarantee, to provide a reasonable period of time before changes go into effect.

14. I understand that if the Program is modified in any way or terminated by order of any government entity, then this Agreement shall be revised or terminated consistent with that order.

15. PG&E may assign this Agreement, in whole or in part, or its rights and obligations hereunder, directly or indirectly, by operation of law or otherwise, without the Applicant's prior written consent, provided PG&E remains obligated for payments incurred prior to the assignment. The Applicant may not assign this Application, in whole or in part, or its rights and obligations hereunder, directly or indirectly, by operation of law or otherwise without the prior written consent of PG&E.

16. I understand the Incentive requires inspections and measurements of the improved performance of the efficiency project. Therefore, I agree to provide access to the Project Site for these purposes to PG&E and/or its agents or assigns and the CPUC and/or its agents or assigns.

17. Funding approved for this Program is limited and will be paid on a first-come, first-served basis to qualified applicants. Funds will only be reserved upon Applicant's acceptance into the Program. This Incentive offer is subject to the availability of authorized funds.

18. I agree to release PG&E, the Trustees of the California State University, the Foundation, California State University, Fresno, and all of said entities' affiliates, subsidiaries, parent company, officers, managers, directors, agents, and employees from all claims, demands, losses, damages, costs, expenses, and liability (legal, contractual, or otherwise), which arise from or are in any way connected with any: (1) injury to or death of persons, including but not limited to employees of PG&E, Foundation, Applicant, or any third party; (2) injury to property or other interests of PG&E, Foundation, Applicant or any third party; (3) violation of local, state, or federal common law, statute, or regulation, including but not limited to environmental laws or regulations; (4) energy savings shortfall; so long as such injury, violation, or shortfall (as set forth in (1) - (4) above) arises from or is in any way connected with the Project, including any third party's performance of or failure to perform the Project, however caused, regardless of any strict liability or negligence of PG&E, Foundation, or said entities' officers, managers, or employees.

19. I certify that no other grant, incentive, rebate, or service from a utility, state, or local government-sponsored program has been, or will be, received in connection with the equipment purchased and installed under this contract. I authorize you to receive any and all information about me, or related to me, that you deem sufficient from any other energy efficiency program in order to verify this.

20. PG&E may suspend or terminate my Application, without cause, upon written notice to me.

21. I understand and agree the implementation of this Project shall comply with all applicable federal, state, and local laws, rules and regulations, and all applicable licenses and permits must be obtained. If permits or licenses are required, Applicant must provide certification of this before incentives or rebates are paid.

APPENDIX D - These guidelines are excerpted from "Pump Efficiency Test Rebate Information Packet – Water Agencies" as seen on **www.itrc.org**. It is to be considered the minimum guidelines for performance of a pump test eligible for the pump test subsidy.
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MINIMUM FIELD REQUIREMENTS FOR PUMP EFFICIENCY TESTING

The following is excerpted from "Pump Efficiency Test Rebate Information Packet – Water Agencies" as seen on **www.itrc.org**. It is to be considered the minimum guidelines for performance of a VALID TEST.

"Minimum requirements include, but are not limited to, the following:

1. Flow rate measurement
   a. If a technique using velocity head is employed (e.g., Collins tube, Cox tube) for a pipe flow rate, the avg. velocity in the test section must be greater than 1 fps.

   b. The test must be conducted using a typical flow rate and pressure.

   c. The flow meters and formulas used must provide a +/- 4% accuracy for the flow rate/velocity ranges that are tested under good testing conditions.

   d. Reasonably accurate flow measurement requires a pipe section without excessive turbulence. Table 1 provides minimum requirements for flow rate test locations to qualify for rebates of the pump efficiency test.

   e. Table 1 terminology can be defined as:

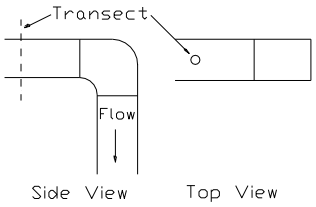
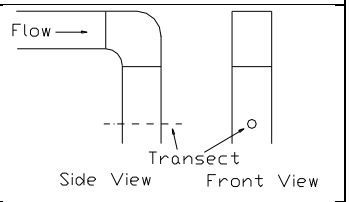
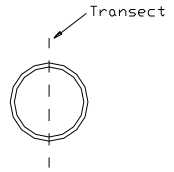
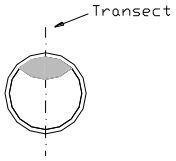
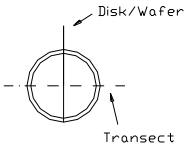
      1) "Minimum distance required for any measurement" indicates that flow measurements must be taken further downstream (or upstream, if indicated) than this from the designated valve or fitting. The pipe section throughout this distance must be of a constant diameter, and be free from any in-line fittings. Distances are expressed as "diameters of pipe". For example, a distance of "3 diameters" on a 12" diameter pipe indicates a distance of 3 x 12" = 36". Pump tests that rely on a flow rate measurement taken within this distance from the valve/fitting do not qualify for a rebate.

      2) "Minimum distance required for a single transect" indicates the distance of clear, unobstructed pipeline downstream (or upstream, if so designated) of a valve/fitting that must be available in order to qualify for a single transect test, or for an ultrasonic test (such as Panameterics®, Controlotron®, or other clamp-on units).

      3) A double transect (perpendicular lines of velocity measurements) test must be used if the flow measurement location is between (1) and (2). In general, the double transect should be conducted using 2 segments of velocity measurements taken in planes of 45 degrees from the top of the pipe. However, the pump tester should use discretion as to the best configuration.

      4) Ultrasonic measurement devices (e.g., Panameterics®, Controlotron®, or other clamp-on units) must follow the same guidelines as the velocity measurement devices. That is, they require a minimum distance for any acceptable reading, and will require a double transect reading in the same conditions described for Collins/Hall tubes.

Table 1. Minimum distance and velocity measurement specifications for flow measurement.

Fitting ID for Pump Efficiency Report	Valve or Fitting	Minimum distance required for any measurement	Minimum distance required for a single transect	Orientation of a single transect
A	Upstream of an elbow	Within the plane	1 diameter upstream of the outer limit of the plane	
B	Downstream of an elbow	0.5 diameters downstream of the outer limit of the plane	2 diameters downstream of the outer limit of the plane	
C	Swing check valve (the flap on this type of check valve swings completely out of the flow path)	2 diameters downstream	4 diameters downstream	
D	Regular check valve	4 diameters downstream	8 diameters downstream	
E	Any partly closed valve, or Pump control valve, or Globe valve	5 diameters downstream	9 diameters downstream	
F	Open gate valve	1.5 diameters downstream	3 diameters downstream	same as “c”
G	Open butterfly valve	1.5 diameters downstream	3 diameters downstream	
H	Pump discharge	1.5 diameters downstream	3 diameters downstream	
I	Other			Please Define

f. The plane of an elbow is tangential to the inner radius of the elbow as shown in Figure 1. No measurements will be accepted from the zone within the plane, defined by the outer limits of the plane. An example of the minimum distance required for a flow measurement near an elbow is illustrated in Figure 2.

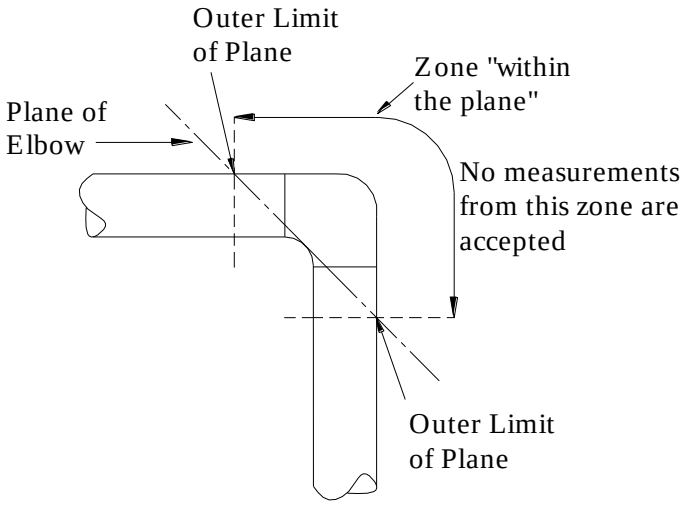


Figure 1. Definition of a "plane" for an elbow. The outer limits of the plane are defined by where the plane hits the pipe on either side of the elbow.

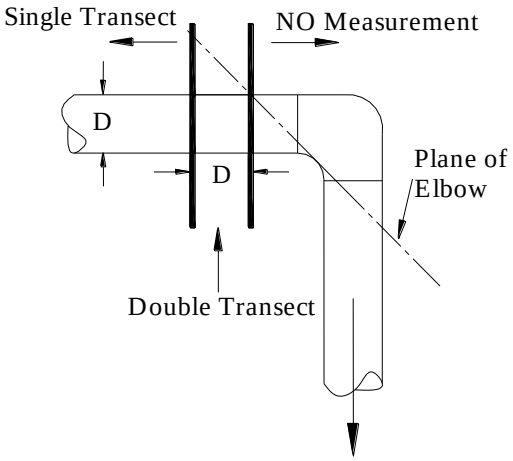


Figure 2. Example of how to use the information. In this case, the flow measurement point is located upstream of the elbow (case "a").

g. The flow test method must be defined, according to Table 2 below.

Table 2. Flow test method identification for Pump Efficiency Report.

ID for Pump Efficiency Report	Method Used for Velocity Measurement
a	Single Transect Velocity
b	Double Transect Velocity
c	Propeller Meter
d	Ultrasonic Meter
e	Other (Please Define)

h. All transect measurements require multiple velocity points in each transect. With a Collins tube, each transect must contain a minimum of 6 points (3 on each side of the centerline of flow), each of which represents the same cross sectional area of the pipe. A Hall tube qualifies as a "multiple velocity point" meter, and therefore only requires one value.

i. A Hall tube must show a scale balance of less than 1.5 for the pump tester to state that this measurement qualifies for documentation in the pump repair program.

Field data summary sheets for ultrasonic measurement devices must include data on

- Signal strength (it must be greater than 50 to obtain an accurate reading.
- Sound speed error. (This is one example of what the pump tester may use as criteria for stating that the test section was inadequate for an accurate measurement).

These are examples of conditions for which a tester will state that the results cannot be guaranteed to be accurate to within +/- 6%.

2. Pressure measurements.
   a. Pressures must be measured with pressure gauges or transducers that have an accuracy within +/- 1.5% of full scale.
   b. A pressure gauge should be selected such that the actual pressure reading is in the middle (or higher) of the gauge range.
   c. Pressure gauge accuracy must be verified as often as required to ensure accuracy within +/- 1.5%.

3. Input kW measurement.
   a. If an accurate power meter is not available for individual pumps, the volts, amps, watts, and power factor must be measured directly using a true RMS meter for all systems of 480 V or below.

4. Total Dynamic Head (TDH) computation for Overall Pumping Plant Efficiency (OPE). The following data must be used to estimate the TDH
   a. For vertical pumps:
      1) Height of the pump discharge pressure measurement point above the ground surface.
      2) Depth from the ground surface to the pumping water level.
      3) Discharge pressure, immediately at the pump discharge and before any valves.
      4) Estimate of column, inlet screen, and discharge head losses. It is understood that the data required to compute these losses may not be available. However, they are indeed components of the TDH. Therefore, all summary sheets given to the customer must include one of the following statements:
         a). "Disclaimer: The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foot valve, and discharge head of the pump."
         or
         b). "The total pressure loss in the column, screen, foot valve, and discharge head of the pump could not be directly measured. However, the total loss is estimated to equal a total of _____ft. When accounting for this, the Overall Pumping Plant Efficiency is _____."
   b. For horizontal pumps:
      1) Inlet pressure.
      2) Discharge pressure, immediately at the pump discharge and before any valves.
      3) Elevation difference between the inlet and discharge pressure measurement points.

C. Verification of accuracy. For each pump test, the pump tester must clearly state
1. If the kWh/AF is certified (by the pump tester) to be within +/- 6% of the true value, and
2. If the test represents standard operating conditions for the pump.

D. The listed requirements are not all-inclusive and only provide some minimum requirements. The pump tester is responsible for using all necessary safety precautions and equipment, and is responsible for certifying the accuracy of all measurements."