

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/14/2019
Pump: F BOOSTER # 1
Nameplate HP: 150.0
Our Pump Test Number: 4303149

This is a booster pump used for Municipal 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 5/14/2019 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:	59 %	69 %	
2. Nameplate Horsepower:	150.0 hp	150.0 hp	Note Change!
3. Motor Efficiency:	92 %	92 %	Note Change!
4. Actual Motor Input Horsepower:	140.3 hp	161.6 hp	
5. Motor loaded at:	86 %	99 %	
6. Flow rate (gpm):	1,593 gpm	1,757 gpm	
7. Inlet Water Level (ft):	-18 ft	-18 ft	
8. Discharge Pressure (psi):	96 psi	117 psi	
9. Total Dynamic Head (feet):	204 ft	251 ft	Rounded TDH = line 7. + (2.31 x line 8.)
10. Million Gallons Pumped/year:	95.32 mg/yr*	95.32 mg/yr*	Same mg/yr AFTER!
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	Same \$/kWh AFTER
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	104,700 kWh/yr	109,291 kWh/yr	-4,591 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	907 hr/yr	93 hr/yr
14. KiloWatt-Hours per Mill Gal:	1,095 kWh/mg	1,143 kWh/mg	-48 kWh/mg
15. Average Cost Per Mill Gal:	\$120.49 \$/mg	\$125.77 \$/mg	(\$5.28)/mg = -4.38%
- Estimated savings = (\$5.28)/MG = -4.38% of energy costs - If pumping 95.32 mg/year this equals about (\$505) 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: F Booster # 1/NONE **HP:** 150 **Utility:** PG&E
GPS Coord.: **Long** -121.7586 **Lat** 36.6633 **Pump Make:** Paco
Motor Make: General Electric **Type:** Centrifugal Pressure Bo **Meter Number:** 10009539689
Customer Addr: Marina Coast Water District **Serial Number:** NONE
2480 Fourth Street **Voltage:** 460 **Amps:** 173
Marina, CA 93933
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/14/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -18

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 96

6. Total Lift (ft): 204

7. Flow Velocity (ft/sec): 13.7

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

8. Measured Flow Rate (gpm): 1,593

9. Customer Flow Rate (gpm): 1,546

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 7.0

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

Million Gallons per 24 Hr: 2.294

12. Cubic Feet per Second (cfs): 3.6

13. Horsepower Input to Motor: 140

14. Percent of Rated Motor Load (%): 86

15. Kilowatt Input to Motor: 105

16. KiloWatt-hours per Mill Gal: 1,095

17. Cost to Pump a Million Gal: \$120.49

18. Energy Cost (\$/hour) \$11.52

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 3,560

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 59

Remarks

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.

Overall efficiency of this plant is considered to be fair assuming this run represents plant's normal operating condition.

This pump had a propeller type flow meter.

This pump has an adequate test section.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Estimated savings of -16 kWh/AF and (\$505.01) annual energy costs from a retrofit

Current OPE of 59% and estimated potential OPE of 69%

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/13/2019
Pump: WELL # 11
Nameplate HP: 300.0
Our Pump Test Number: 4303139

This is a water well used for Municipal and assumed to be operated 2710 hours/year.

The following Pumping Cost Analysis is presented as an estimate prepared from data acquired from the pump test performed 5/13/2019 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:	65 %	70 %	
2. Nameplate Horsepower:	300.0 hp	300.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	93 %	93 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	267.2 hp	300.6 hp	
5. Motor loaded at:	82 %	93 %	
6. Flow rate (gpm):	1,889 gpm	2,217 gpm	
7. Pumping Level (ft):	292 ft	307 ft	
8. Discharge Pressure (psi):	30 psi	30 psi	
9. Total Dynamic Head (feet):	362 ft	376 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	306.33 mg/yr*	306.33 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	540,103 kWh/yr	517,838 kWh/yr	22,265 kWh/yr
13. Hours of Operation/yr:	2,710 hr/yr*	2,309 hr/yr	401 hr/yr
14. KiloWatt-Hours per Mill Gal:	1,758 kWh/mg	1,686 kWh/mg	72 kWh/mg
15. Average Cost Per Mill Gal:	\$193.41 \$/mg	\$185.44 \$/mg	\$7.97/mg = 4.12%
- Estimated savings = \$7.97/MG = 4.12% of energy costs - If pumping 306.33 mg/year this equals about \$2,449 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location:	Well # 11/Salinas Street	HP:	300	Utility:	PG&E
GPS Coord.:	Long -121.779	Lat	36.6773	Pump Make:	Peerless
Motor Make:	B.M.R.	Type:	Well	Meter Number:	1006732351
Customer Addr:	Marina Coast Water District	Serial Number:	NONE	Voltage:	460
	2480 Fourth Street	Amps:	340		
	Marina, CA 93933				
Contact:	Derick Cray	Our Test #:			
Phone:	(831) 883-5903	Fax:	(831) 384-2479	Cell:	(831) 333-6470

Test Results

Test Date: 5/13/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

1. Pumping Water Level (ft):	292
2. Standing Water Level (ft):	208
3. Draw Down (ft):	84
4. Recovered Water Level (ft):	208
5. Discharge Pressure at Gauge (psi):	30
6. Total Lift (ft):	362
7. Flow Velocity (ft/sec):	4.7
8. Measured Flow Rate (gpm):	1,889
9. Customer Flow Rate (gpm):	1,901
10. Specific Capacity (gpm/ft draw):	22.5
11. Acre Feet per 24 Hr:	8.3
Million Gallons per 24 Hr:	2.720
12. Cubic Feet per Second (cfs):	4.2
13. Horsepower Input to Motor:	267
14. Percent of Rated Motor Load (%):	82
15. Kilowatt Input to Motor:	199
16. KiloWatt-hours per Mill Gal:	1,758
17. Cost to Pump a Million Gal:	\$193.41
18. Energy Cost (\$/hour)	\$21.92
19. Base Cost per Kwh:	\$0.110
20. Nameplate rpm:	1,770
21. rpm at Gearhead:	0
22. Overall Pumping Efficiency (%):	65

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).

Remarks

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.

Overall efficiency of this plant is considered to be good assuming this run represents plant's normal operating condition.

Test results may be impaired due to poor hydraulic test section.

Pump started for test, pumping water level could still be drawing down.

This pump had a propeller type flow meter.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Estimated savings of 24 kWh/AF and \$2,449.17 annual energy costs from a retrofit

Current OPE of 65% and estimated potential OPE of 70%

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/13/2019
Pump: WELL # 30
Nameplate HP: 150.0
Our Pump Test Number: 4303141

This is a water well used for Municipal and assumed to be operated 1414 hours/year.

The current OPE is high enough that little or no cost savings are estimated from a retrofit/repair.

NOTE: * denotes a value that was Assumed or Provided by Customer	Measured Pump Condition	Assumed Condition After Retrofit	Notes
1. Overall pumping efficiency:	67 %	67 %	
2. Nameplate Horsepower:	150.0 hp	150.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	96 %	96 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	144.1 hp	144.1 hp	
5. Motor loaded at:	92 %	92 %	
6. Flow rate (gpm):	1,591 gpm	1,591 gpm	
7. Pumping Level (ft):	174 ft	174 ft	
8. Discharge Pressure (psi):	28 psi	28 psi	
9. Total Dynamic Head (feet):	240 ft	239 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	134.62 mg/yr*	134.62 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	152,005 kWh/yr	152,005 kWh/yr	0 kWh/yr
13. Hours of Operation/yr:	1,414 hr/yr*	1,414 hr/yr	0 hr/yr
14. KiloWatt-Hours per Mill Gal:	1,126 kWh/mg	1,126 kWh/mg	0 kWh/mg
15. Average Cost Per Mill Gal:	\$123.86 \$/mg	\$123.86 \$/mg	\$0.00/mg = 0.00%
- Estimated savings = \$0.00/MG = 0.00% of energy costs - If pumping 134.62 mg/year this equals about \$0 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location:	Well # 30/Reservation Road	HP:	150	Utility:	PG&E
GPS Coord.:	Long -121.7513	Lat	36.6668	Pump Make:	Flowserve
Motor Make:	U.S.	Type:	Well	Meter Number:	1009381412
Customer Addr:	Marina Coast Water District	Serial Number:	NONE	Voltage:	460
	2480 Fourth Street	Amps:	65.9		
	Marina, CA 93933				
Contact:	Derick Cray	Our Test #:			
Phone:	(831) 883-5903	Fax:	(831) 384-2479	Cell:	(831) 333-6470

Test Results

Test Date: 5/13/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

1. Pumping Water Level (ft):	174
2. Standing Water Level (ft):	161.5
3. Draw Down (ft):	13
4. Recovered Water Level (ft):	161.5
5. Discharge Pressure at Gauge (psi):	28
6. Total Lift (ft):	240
7. Flow Velocity (ft/sec):	3.7
8. Measured Flow Rate (gpm):	1,591
9. Customer Flow Rate (gpm):	1,390
10. Specific Capacity (gpm/ft draw):	127.3
11. Acre Feet per 24 Hr:	7.0
Million Gallons per 24 Hr:	2.291
12. Cubic Feet per Second (cfs):	3.5
13. Horsepower Input to Motor:	144
14. Percent of Rated Motor Load (%):	92
15. Kilowatt Input to Motor:	108
16. KiloWatt-hours per Mill Gal:	1,126
17. Cost to Pump a Million Gal:	\$123.86
18. Energy Cost (\$/hour)	\$11.83
19. Base Cost per Kwh:	\$0.110
20. Nameplate rpm:	1,780
21. rpm at Gearhead:	0
22. Overall Pumping Efficiency (%):	67

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).

Remarks

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.

Overall efficiency of this plant is considered to be good assuming this run represents plant's normal operating condition.

Pump started for test, pumping water level could still be drawing down.

Test results may be impaired due to poor hydraulic test section.

This pump had a propeller type flow meter.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Current OPE is close to optimum - no savings estimated for a retrofit

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/15/2019
Pump: MARINA BOOSTER # 1
Nameplate HP: 75.0
Our Pump Test Number: 4303157

This is a booster pump used for Municipal and assumed to be operated 1000 hours/year.

The current OPE is high enough that little or no cost savings are estimated from a retrofit/repair.

NOTE: * denotes a value that was Assumed or Provided by Customer	Measured Pump Condition	Assumed Condition After Retrofit	Notes
1. Overall pumping efficiency:	64 %	64 %	
2. Nameplate Horsepower:	75.0 hp	75.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	95 %	95 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	85.1 hp	85.1 hp	
5. Motor loaded at:	108 %	108 %	
6. Flow rate (gpm):	1,581 gpm	1,581 gpm	
7. Inlet Water Level (ft):	-2 ft	-2 ft	
8. Discharge Pressure (psi):	60 psi	60 psi	
9. Total Dynamic Head (feet):	137 ft	136 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	94.61 mg/yr*	94.61 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	63,450 kWh/yr	63,450 kWh/yr	0 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	1,000 hr/yr	0 hr/yr
14. KiloWatt-Hours per Mill Gal:	669 kWh/mg	669 kWh/mg	0 kWh/mg
15. Average Cost Per Mill Gal:	\$73.57 \$/mg	\$73.57 \$/mg	\$0.00/mg = 0.00%
- Estimated savings = \$0.00/MG = 0.00% of energy costs - If pumping 94.61 mg/year this equals about \$0 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: Marina Booster # 1/Deforest Street **HP:** 75 **Utility:** PG&E
GPS Coord.: **Long** -121.7872 **Lat** 36.6905 **Pump Make:** Aurora
Motor Make: U.S. **Type:** Centrifugal Pressure Bo **Meter Number:** 1009480731
Customer Addr: Marina Coast Water District **Serial Number:** Y047669657-0003M
2480 Fourth Street **Voltage:** 460 **Amps:** 86
Marina, CA 93933
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/15/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -2

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 60

6. Total Lift (ft): 137

7. Flow Velocity (ft/sec): 3.9

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

8. Measured Flow Rate (gpm): 1,581

9. Customer Flow Rate (gpm): 1,553

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 7.0

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

Million Gallons per 24 Hr: 2.277

12. Cubic Feet per Second (cfs): 3.5

13. Horsepower Input to Motor: 85

14. Percent of Rated Motor Load (%): 108

15. Kilowatt Input to Motor: 63

16. KiloWatt-hours per Mill Gal: 669

17. Cost to Pump a Million Gal: \$73.57

18. Energy Cost (\$/hour) \$6.98

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 1,785

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 64

Remarks

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.

Overall efficiency of this plant is considered to be good assuming this run represents plant's normal operating condition.

This pump has an adequate test section.

This pump had a propeller type flow meter.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the Cla valve and disch
Aurroa Pump design 1500 GPM @ 151 TDH.

Current OPE is close to optimum - no savings estimated for a retrofit

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/15/2019
Pump: MARINA BOOSTER # 2
Nameplate HP: 75.0
Our Pump Test Number: 4303156

This is a booster pump used for Municipal and assumed to be operated 1000 hours/year.

The current OPE is high enough that little or no cost savings are estimated from a retrofit/repair.

NOTE: * denotes a value that was Assumed or Provided by Customer	Measured Pump Condition	Assumed Condition After Retrofit	Notes
1. Overall pumping efficiency:	64 %	64 %	
2. Nameplate Horsepower:	75.0 hp	75.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	91 %	91 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	84.2 hp	84.2 hp	
5. Motor loaded at:	102 %	102 %	
6. Flow rate (gpm):	1,554 gpm	1,554 gpm	
7. Inlet Water Level (ft):	-2 ft	-2 ft	
8. Discharge Pressure (psi):	60 psi	60 psi	
9. Total Dynamic Head (feet):	137 ft	136 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	92.99 mg/yr*	92.99 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	62,800 kWh/yr	62,800 kWh/yr	0 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	1,000 hr/yr	0 hr/yr
14. KiloWatt-Hours per Mill Gal:	673 kWh/mg	673 kWh/mg	0 kWh/mg
15. Average Cost Per Mill Gal:	\$74.08 \$/mg	\$74.08 \$/mg	\$0.00/mg = 0.00%
- Estimated savings = \$0.00/MG = 0.00% of energy costs - If pumping 92.99 mg/year this equals about \$0 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: Marina Booster # 2/Deforest Street **HP:** 75 **Utility:** PG&E
GPS Coord.: **Long** -121.7872 **Lat** 36.6905 **Pump Make:** Aurora
Motor Make: U.S. **Type:** Centrifugal Pressure Bo **Meter Number:** 1009480731
Customer Addr: Marina Coast Water District **Serial Number:** NONE
2480 Fourth Street **Voltage:** 460 **Amps:** 86
Marina, CA 93933
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/15/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -2

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 60

6. Total Lift (ft): 137

7. Flow Velocity (ft/sec): 3.9

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

8. Measured Flow Rate (gpm): 1,554

9. Customer Flow Rate (gpm): 1,535

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 6.9

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

Million Gallons per 24 Hr: 2.238

12. Cubic Feet per Second (cfs): 3.5

13. Horsepower Input to Motor: 84

14. Percent of Rated Motor Load (%): 102

15. Kilowatt Input to Motor: 63

16. KiloWatt-hours per Mill Gal: 673

17. Cost to Pump a Million Gal: \$74.08

18. Energy Cost (\$/hour) \$6.91

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 1,785

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 64

Remarks

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.

Overall efficiency of this plant is considered to be good assuming this run represents plant's normal operating condition.

This pump has an adequate test section.

This pump had a propeller type flow meter.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Pump design is 1500 GPM @ 151 TDH

Current OPE is close to optimum - no savings estimated for a retrofit

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/13/2019
Pump: WELL # 31
Nameplate HP: 300.0
Our Pump Test Number: 4303142

This is a water well used for Municipal and assumed to be operated 1287 hours/year.

The following Pumping Cost Analysis is presented as an estimate prepared from data acquired from the pump test performed 5/13/2019 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:	58 %	70 %	
2. Nameplate Horsepower:	300.0 hp	300.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	96 %	96 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	228.1 hp	345.8 hp	
5. Motor loaded at:	73 %	110 %	
6. Flow rate (gpm):	2,460 gpm	4,070 gpm	
7. Pumping Level (ft):	150 ft	173 ft	
8. Discharge Pressure (psi):	27 psi	27 psi	
9. Total Dynamic Head (feet):	213 ft	236 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	189.45 mg/yr*	189.45 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	218,983 kWh/yr	200,677 kWh/yr	18,306 kWh/yr
13. Hours of Operation/yr:	1,287 hr/yr*	778 hr/yr	509 hr/yr
14. KiloWatt-Hours per Mill Gal:	1,153 kWh/mg	1,056 kWh/mg	96 kWh/mg
15. Average Cost Per Mill Gal:	\$126.79 \$/mg	\$116.20 \$/mg	\$10.60/mg = 8.36%
- Estimated savings = \$10.60/MG = 8.36% of energy costs - If pumping 189.45 mg/year this equals about \$2,014 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: Well # 31/Reservation Road **HP:** 300 **Utility:** PG&E
GPS Coord.: **Long** -121.7534 **Lat** 36.6633 **Pump Make:** Byron Jackson
Motor Make: General Electric **Type:** Well **Meter Number:** 1009485925
Customer Addr: Marina Coast Water District
2480 Fourth Street
Marina, CA 93933 **Serial Number:** NONE
Voltage: 460 **Amps:** 359
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/13/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

1. Pumping Water Level (ft):	150
2. Standing Water Level (ft):	115
3. Draw Down (ft):	35
4. Recovered Water Level (ft):	115
5. Discharge Pressure at Gauge (psi):	27
6. Total Lift (ft):	213
7. Flow Velocity (ft/sec):	5.8
8. Measured Flow Rate (gpm):	2,460
9. Customer Flow Rate (gpm):	2,150
10. Specific Capacity (gpm/ft draw):	70.0
11. Acre Feet per 24 Hr:	10.9
Million Gallons per 24 Hr:	3.543
12. Cubic Feet per Second (cfs):	5.5
13. Horsepower Input to Motor:	228
14. Percent of Rated Motor Load (%):	73
15. Kilowatt Input to Motor:	170
16. KiloWatt-hours per Mill Gal:	1,153
17. Cost to Pump a Million Gal:	\$126.79
18. Energy Cost (\$/hour)	\$18.72
19. Base Cost per Kwh:	\$0.110
20. Nameplate rpm:	1,785
21. rpm at Gearhead:	0
22. Overall Pumping Efficiency (%):	58

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).

Remarks

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.

Overall efficiency of this plant is considered to be fair assuming this run represents plant's normal operating condition.

Air line used to achieve static and pumping water level in well.

Test results may be impaired due to poor hydraulic test section.

This pump had a digital flow meter.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Estimated savings of 31 kWh/AF and \$2,013.64 annual energy costs from a retrofit

Current OPE of 58% and estimated potential OPE of 70%

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/14/2019
Pump: C-1
Nameplate HP: 125.0
Our Pump Test Number: 4303146

This is a booster pump used for Municipal 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 5/14/2019 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:	47 %	68 %	
2. Nameplate Horsepower:	125.0 hp	125.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	95 %	95 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	110.8 hp	132.5 hp	
5. Motor loaded at:	85 %	101 %	
6. Flow rate (gpm):	990 gpm	1,191 gpm	
7. Inlet Water Level (ft):	-5 ft	-5 ft	
8. Discharge Pressure (psi):	91 psi	132 psi	
9. Total Dynamic Head (feet):	207 ft	300 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	59.24 mg/yr*	59.24 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	82,620 kWh/yr	82,150 kWh/yr	471 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	831 hr/yr	169 hr/yr
14. KiloWatt-Hours per Mill Gal:	1,391 kWh/mg	1,383 kWh/mg	8 kWh/mg
15. Average Cost Per Mill Gal:	\$152.99 \$/mg	\$152.12 \$/mg	\$0.87/mg = 0.57%
- Estimated savings = \$0.87/MG = 0.57% of energy costs - If pumping 59.24 mg/year this equals about \$52 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: C-1/California Street **HP:** 125 **Utility:** PG&E
GPS Coord.: **Long** -121.7937 **Lat** 36.66643 **Pump Make:** Paco
Motor Make: U.S. **Type:** Centrifugal Pressure Bo **Meter Number:** 1009485926
Customer Addr: Marina Coast Water District **Serial Number:** NONE
2480 Fourth Street **Voltage:** 460 **Amps:** 140
Marina, CA 93933
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/14/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -5

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 91

6. Total Lift (ft): 207

7. Flow Velocity (ft/sec): 5.4

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

8. Measured Flow Rate (gpm): 990

9. Customer Flow Rate (gpm): 0

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 4.4

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

Million Gallons per 24 Hr: 1.426

12. Cubic Feet per Second (cfs): 2.2

13. Horsepower Input to Motor: 111

14. Percent of Rated Motor Load (%): 85

15. Kilowatt Input to Motor: 83

16. KiloWatt-hours per Mill Gal: 1,391

17. Cost to Pump a Million Gal: \$152.99

18. Energy Cost (\$/hour) \$9.09

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 1,780

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 47

Remarks

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.

Overall efficiency of this plant is considered to be low assuming this run represents plant's normal operating condition.

This pump has an adequate test section.

This pump had a digital flow meter, which was not working at time of testing

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Estimated savings of 3 kWh/AF and \$51.76 annual energy costs from a retrofit

Current OPE of 47% and estimated potential OPE of 68%

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/14/2019
Pump: B-2
Nameplate HP: 125.0
Our Pump Test Number: 4303144

This is a booster pump used for Municipal 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 5/14/2019 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:	62 %	68 %	
2. Nameplate Horsepower:	125.0 hp	125.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	92 %	92 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	122.4 hp	127.7 hp	
5. Motor loaded at:	90 %	93 %	
6. Flow rate (gpm):	1,664 gpm	1,738 gpm	
7. Inlet Water Level (ft):	-14 ft	-14 ft	
8. Discharge Pressure (psi):	84 psi	92 psi	
9. Total Dynamic Head (feet):	181 ft	198 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	99.57 mg/yr*	99.57 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	91,310 kWh/yr	91,181 kWh/yr	129 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	957 hr/yr	43 hr/yr
14. KiloWatt-Hours per Mill Gal:	914 kWh/mg	913 kWh/mg	1 kWh/mg
15. Average Cost Per Mill Gal:	\$100.59 \$/mg	\$100.45 \$/mg	\$0.14/mg = 0.14%
- Estimated savings = \$0.14/MG = 0.14% of energy costs - If pumping 99.57 mg/year this equals about \$14 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: B-2/California Street **HP:** 125 **Utility:** PG&E
GPS Coord.: **Long** -121.7916 **Lat** 36.66975 **Pump Make:** Paco
Motor Make: Fairbanks-Morse **Type:** Centrifugal Pressure Bo **Meter Number:** 1009485926
Customer Addr: Marina Coast Water District
2480 Fourth Street
Marina, CA 93933 **Serial Number:** NONE
Voltage: 440 **Amps:** 146
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/14/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -14

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 84

6. Total Lift (ft): 181

7. Flow Velocity (ft/sec): 5.5

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

8. Measured Flow Rate (gpm): 1,664

9. Customer Flow Rate (gpm): 0

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 7.4

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

Million Gallons per 24 Hr: 2.396

12. Cubic Feet per Second (cfs): 3.7

13. Horsepower Input to Motor: 122

14. Percent of Rated Motor Load (%): 90

15. Kilowatt Input to Motor: 91

16. KiloWatt-hours per Mill Gal: 914

17. Cost to Pump a Million Gal: \$100.59

18. Energy Cost (\$/hour) \$10.04

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 1,755

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 62

Remarks

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.

Overall efficiency of this plant is considered to be good assuming this run represents plant's normal operating condition.

This pump has an adequate test section.

This pump did not have a flow meter that was working

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Estimated savings of kWh/AF and \$14.15 annual energy costs from a retrofit

Current OPE of 62% and estimated potential OPE of 68%

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/14/2019
Pump: B-3
Nameplate HP: 125.0
Our Pump Test Number: 4303145

This is a booster pump used for Municipal 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 5/14/2019 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:	63 %	68 %	
2. Nameplate Horsepower:	125.0 hp	125.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	92 %	92 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	120.9 hp	138.1 hp	
5. Motor loaded at:	88 %	101 %	
6. Flow rate (gpm):	1,560 gpm	1,676 gpm	
7. Inlet Water Level (ft):	-5 ft	-5 ft	
8. Discharge Pressure (psi):	85 psi	98 psi	
9. Total Dynamic Head (feet):	193 ft	222 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	93.35 mg/yr*	93.35 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	90,190 kWh/yr	95,901 kWh/yr	-5,711 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	931 hr/yr	69 hr/yr
14. KiloWatt-Hours per Mill Gal:	963 kWh/mg	1,024 kWh/mg	-61 kWh/mg
15. Average Cost Per Mill Gal:	\$105.98 \$/mg	\$112.69 \$/mg	(\$6.71)/mg = -6.33%
- Estimated savings = (\$6.71)/MG = -6.33% of energy costs - If pumping 93.35 mg/year this equals about (\$628) 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: B-3/California Street **HP:** 125 **Utility:** PG&E
GPS Coord.: **Long** -121.7936 **Lat** 36.66623 **Pump Make:** Paco
Motor Make: U.S. **Type:** Centrifugal Pressure Bo **Meter Number:** 1009485926
Customer Addr: Marina Coast Water District **Serial Number:** NONE
2480 Fourth Street **Voltage:** 440 **Amps:** 151
Marina, CA 93933
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/14/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -5

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 85

6. Total Lift (ft): 193

7. Flow Velocity (ft/sec): 5.2

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

8. Measured Flow Rate (gpm): 1,560

9. Customer Flow Rate (gpm): 0

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 6.9

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

Million Gallons per 24 Hr: 2.247

12. Cubic Feet per Second (cfs): 3.5

13. Horsepower Input to Motor: 121

14. Percent of Rated Motor Load (%): 88

15. Kilowatt Input to Motor: 90

16. KiloWatt-hours per Mill Gal: 963

17. Cost to Pump a Million Gal: \$105.98

18. Energy Cost (\$/hour) \$9.92

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 1,800

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 63

Remarks

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.

Overall efficiency of this plant is considered to be good assuming this run represents plant's normal operating condition.

This pump has an adequate test section.

This pump did not have a flow meter.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Estimated savings of -20 kWh/AF and (\$628.23) annual energy costs from a retrofit

Current OPE of 63% and estimated potential OPE of 68%

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/14/2019
Pump: C-4
Nameplate HP: 125.0
Our Pump Test Number: 4303147

This is a booster pump used for Municipal 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 5/14/2019 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:	73 %	76 %	
2. Nameplate Horsepower:	125.0 hp	125.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	92 %	92 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	139.8 hp	139.8 hp	
5. Motor loaded at:	102 %	102 %	
6. Flow rate (gpm):	1,425 gpm	1,425 gpm	
7. Inlet Water Level (ft):	-7 ft	-7 ft	
8. Discharge Pressure (psi):	125 psi	125 psi	
9. Total Dynamic Head (feet):	283 ft	282 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	85.27 mg/yr*	85.27 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	104,300 kWh/yr	104,300 kWh/yr	0 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	1,000 hr/yr	0 hr/yr
14. KiloWatt-Hours per Mill Gal:	1,220 kWh/mg	1,220 kWh/mg	0 kWh/mg
15. Average Cost Per Mill Gal:	\$134.18 \$/mg	\$134.18 \$/mg	\$0.00/mg = 0.00%
- Estimated savings = \$0.00/MG = 0.00% of energy costs			
- If pumping 85.27 mg/year this equals about \$0 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: C-4/California Street **HP:** 125 **Utility:** PG&E
GPS Coord.: **Long** -121.7926 **Lat** 36.66989 **Pump Make:** Paco
Motor Make: Weg **Type:** Centrifugal Pressure Bo **Meter Number:** 1009485926
Customer Addr: Marina Coast Water District **Serial Number:** NONE
2480 Fourth Street **Voltage:** 460 **Amps:** 136
Marina, CA 93933
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/14/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -7

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 125

6. Total Lift (ft): 283

7. Flow Velocity (ft/sec): 7.7

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

8. Measured Flow Rate (gpm): 1,425

9. Customer Flow Rate (gpm): 0

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 6.3

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

Million Gallons per 24 Hr: 2.052

12. Cubic Feet per Second (cfs): 3.2

13. Horsepower Input to Motor: 140

14. Percent of Rated Motor Load (%): 102

15. Kilowatt Input to Motor: 104

16. KiloWatt-hours per Mill Gal: 1,220

17. Cost to Pump a Million Gal: \$134.18

18. Energy Cost (\$/hour) \$11.47

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 1,780

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 73

Remarks

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.

Overall efficiency of this plant is considered to be very good assuming this run represents plant's normal operating condition.

This pump has an adequate test section.

This pump did not have a flow meter.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Current OPE is close to optimum - no savings estimated for a retrofit

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/14/2019
Pump: C-5
Nameplate HP: 125.0
Our Pump Test Number: 4303148

This is a booster pump used for Municipal and assumed to be operated 1000 hours/year.

The current OPE is high enough that little or no cost savings are estimated from a retrofit/repair.

NOTE: * denotes a value that was Assumed or Provided by Customer	Measured Pump Condition	Assumed Condition After Retrofit	Notes
1. Overall pumping efficiency:	63 %	63 %	
2. Nameplate Horsepower:	125.0 hp	125.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	92 %	92 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	140.9 hp	140.9 hp	
5. Motor loaded at:	104 %	104 %	
6. Flow rate (gpm):	1,245 gpm	1,245 gpm	
7. Inlet Water Level (ft):	-9 ft	-9 ft	
8. Discharge Pressure (psi):	126 psi	126 psi	
9. Total Dynamic Head (feet):	283 ft	282 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	74.50 mg/yr*	74.50 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	105,100 kWh/yr	105,100 kWh/yr	0 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	1,000 hr/yr	0 hr/yr
14. KiloWatt-Hours per Mill Gal:	1,407 kWh/mg	1,407 kWh/mg	0 kWh/mg
15. Average Cost Per Mill Gal:	\$154.75 \$/mg	\$154.75 \$/mg	\$0.00/mg = 0.00%
- Estimated savings = \$0.00/MG = 0.00% of energy costs - If pumping 74.50 mg/year this equals about \$0 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: C-5/California Street **HP:** 125 **Utility:** PG&E
GPS Coord.: **Long** -121.794 **Lat** 36.66655 **Pump Make:** Paco
Motor Make: General Electric **Type:** Centrifugal Pressure Bo **Meter Number:** 1009486852
Customer Addr: Marina Coast Water District **Serial Number:** NONE
2480 Fourth Street **Voltage:** 460 **Amps:** 148
Marina, CA 93933
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/14/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -9

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 126

6. Total Lift (ft): 283

7. Flow Velocity (ft/sec): 4.3

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

8. Measured Flow Rate (gpm): 1,245

9. Customer Flow Rate (gpm): 0

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 5.5

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

Million Gallons per 24 Hr: 1.793

12. Cubic Feet per Second (cfs): 2.8

13. Horsepower Input to Motor: 141

14. Percent of Rated Motor Load (%): 104

15. Kilowatt Input to Motor: 105

16. KiloWatt-hours per Mill Gal: 1,407

17. Cost to Pump a Million Gal: \$154.75

18. Energy Cost (\$/hour) \$11.56

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 1,780

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 63

Remarks

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.

Overall efficiency of this plant is considered to be good assuming this run represents plant's normal operating condition.

Test results may be impaired due to poor hydraulic test section.

This pump did not have a flow meter.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Current OPE is close to optimum - no savings estimated for a retrofit

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/13/2019
Pump: WELL # 34
Nameplate HP: 300.0
Our Pump Test Number: 4303143

This is a water well used for Municipal and assumed to be operated 1365 hours/year.

The current OPE is high enough that little or no cost savings are estimated from a retrofit/repair.

NOTE: * denotes a value that was Assumed or Provided by Customer	Measured Pump Condition	Assumed Condition After Retrofit	Notes
1. Overall pumping efficiency:	75 %	75 %	
2. Nameplate Horsepower:	300.0 hp	300.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	95 %	95 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	286.5 hp	286.5 hp	
5. Motor loaded at:	91 %	91 %	
6. Flow rate (gpm):	2,200 gpm	2,200 gpm	
7. Pumping Level (ft):	351 ft	351 ft	
8. Discharge Pressure (psi):	14 psi	14 psi	
9. Total Dynamic Head (feet):	385 ft	383 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	179.70 mg/yr*	179.70 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	291,701 kWh/yr	291,701 kWh/yr	0 kWh/yr
13. Hours of Operation/yr:	1,365 hr/yr*	1,365 hr/yr	0 hr/yr
14. KiloWatt-Hours per Mill Gal:	1,619 kWh/mg	1,619 kWh/mg	0 kWh/mg
15. Average Cost Per Mill Gal:	\$178.07 \$/mg	\$178.07 \$/mg	\$0.00/mg = 0.00%
- Estimated savings = \$0.00/MG = 0.00% of energy costs - If pumping 179.70 mg/year this equals about \$0 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: Well # 34/Resveration Road **HP:** 300 **Utility:** PG&E
GPS Coord.: **Long** -121.7412 **Lat** 36.6593 **Pump Make:** Flowserve
Motor Make: U.S. **Type:** Well **Meter Number:** 1009486906
Customer Addr: Marina Coast Water District
2480 Fourth Street
Marina, CA 93933 **Serial Number:** NONE
Voltage: 460 **Amps:** 340
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/13/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

1. Pumping Water Level (ft):	351
2. Standing Water Level (ft):	231
3. Draw Down (ft):	120
4. Recovered Water Level (ft):	231
5. Discharge Pressure at Gauge (psi):	14
6. Total Lift (ft):	385
7. Flow Velocity (ft/sec):	7.6
8. Measured Flow Rate (gpm):	2,200
9. Customer Flow Rate (gpm):	2,175
10. Specific Capacity (gpm/ft draw):	18.3
11. Acre Feet per 24 Hr:	9.7
Million Gallons per 24 Hr:	3.168
12. Cubic Feet per Second (cfs):	4.9
13. Horsepower Input to Motor:	286
14. Percent of Rated Motor Load (%):	91
15. Kilowatt Input to Motor:	214
16. KiloWatt-hours per Mill Gal:	1,619
17. Cost to Pump a Million Gal:	\$178.07
18. Energy Cost (\$/hour)	\$23.51
19. Base Cost per Kwh:	\$0.110
20. Nameplate rpm:	1,780
21. rpm at Gearhead:	0
22. Overall Pumping Efficiency (%):	75

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).

Remarks

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.

Overall efficiency of this plant is considered to be very good assuming this run represents plant's normal operating condition.

Test results may be impaired due to poor hydraulic test section.

Pump started for test, pumping water level could still be drawing down.

This pump had a propeller type flow meter.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Current OPE is close to optimum - no savings estimated for a retrofit

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/13/2019
Pump: WELL #29
Nameplate HP: 200.0
Our Pump Test Number: 4303140

This is a water well used for Municipal and assumed to be operated 862 hours/year.

No Cost Analysis could be performed since the current Overall Pumping Plant Efficiency could not be determined. Discuss this with your pump tester.

NOTE: * denotes a value that was Assumed or Provided by Customer	Measured Pump Condition	Assumed Condition After Retrofit	Notes
1. Overall pumping efficiency:	0 %	0 %	
2. Nameplate Horsepower:	200.0 hp	0.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	92 %	0 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	148.0 hp	0.0 hp	
5. Motor loaded at:	68 %	0 %	
6. Flow rate (gpm):	1,547 gpm	0 gpm	
7. Pumping Level (ft):	0 ft	0 ft	
8. Discharge Pressure (psi):	20 psi	0 psi	
9. Total Dynamic Head (feet):	0 ft	0 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	0.00 mg/yr*	0.00 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	95,165 kWh/yr	0 kWh/yr	0 kWh/yr
13. Hours of Operation/yr:	862 hr/yr*	0 hr/yr	0 hr/yr
14. KiloWatt-Hours per Mill Gal:	1,189 kWh/mg	0 kWh/mg	0 kWh/mg
15. Average Cost Per Mill Gal:	\$130.82 \$/mg	\$0.00 \$/mg	#####
No calculation of annual savings because annual hours of operation not given.			

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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: Well #29/Reservation Road **HP:** 200 **Utility:** PG&E
GPS Coord.: **Long** -121.7546 **Lat** 36.6625 **Pump Make:** No Name Plate
Motor Make: General Electric **Type:** Well **Meter Number:** 1009511940
Customer Addr: Marina Coast Water District **Serial Number:** NONE
2480 Fourth Street **Voltage:** 460 **Amps:** 245
Marina, CA 93933
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/13/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

1. Pumping Water Level (ft): 0
2. Standing Water Level (ft): 0
3. Draw Down (ft):
4. Recovered Water Level (ft): 0
5. Discharge Pressure at Gauge (psi): 20
6. Total Lift (ft): 0
7. Flow Velocity (ft/sec): 3.6
8. Measured Flow Rate (gpm): 1,547
9. Customer Flow Rate (gpm): 1,474
10. Specific Capacity (gpm/ft draw):
11. Acre Feet per 24 Hr: 6.8
Million Gallons per 24 Hr: 2.228
12. Cubic Feet per Second (cfs): 3.4
13. Horsepower Input to Motor: 148
14. Percent of Rated Motor Load (%): 68
15. Kilowatt Input to Motor: 110
16. KiloWatt-hours per Mill Gal: 1,189
17. Cost to Pump a Million Gal: \$130.82
18. Energy Cost (\$/hour) \$12.14
19. Base Cost per Kwh: \$0.110
20. Nameplate rpm: 1,785
21. rpm at Gearhead: 0
22. Overall Pumping Efficiency (%): 0

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).

Remarks

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.

Overall efficiency unknown due to inability to measure Pumping Water Level.

This pump has an adequate test section.

This pump had a propeller type flow meter.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

OPE cannot be calculated, no estimate of potential savings from a retrofit available

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/14/2019
Pump: D BOOSTER # 1
Nameplate HP: 100.0
Our Pump Test Number: 4303151

This is a booster pump used for Municipal 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 5/14/2019 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:	73 %	76 %	
2. Nameplate Horsepower:	100.0 hp	100.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	95 %	95 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	110.5 hp	106.3 hp	
5. Motor loaded at:	104 %	100 %	
6. Flow rate (gpm):	1,942 gpm	1,942 gpm	
7. Inlet Water Level (ft):	-39 ft	-39 ft	
8. Discharge Pressure (psi):	88 psi	88 psi	
9. Total Dynamic Head (feet):	165 ft	164 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	116.21 mg/yr*	116.21 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	82,400 kWh/yr	79,320 kWh/yr	3,080 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	1,000 hr/yr	0 hr/yr
14. KiloWatt-Hours per Mill Gal:	707 kWh/mg	681 kWh/mg	26 kWh/mg
15. Average Cost Per Mill Gal:	\$77.78 \$/mg	\$74.88 \$/mg	\$2.91/mg = 3.74%
- Estimated savings = \$2.91/MG = 3.74% of energy costs - If pumping 116.21 mg/year this equals about \$339 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: D Booster # 1/Gigling Road **HP:** 100 **Utility:** PG&E
GPS Coord.: **Long** -121.7997 **Lat** 36.6464 **Pump Make:** Paco
Motor Make: U.S. **Type:** Centrifugal Pressure Bo **Meter Number:** 1009537207
Customer Addr: Marina Coast Water District **Serial Number:** NONE
2480 Fourth Street **Voltage:** 460 **Amps:** 112
Marina, CA 93933
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/14/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -39

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 88

6. Total Lift (ft): 165

7. Flow Velocity (ft/sec): 4.6

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

8. Measured Flow Rate (gpm): 1,942

9. Customer Flow Rate (gpm): 1,945

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 8.6

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

Million Gallons per 24 Hr: 2.797

12. Cubic Feet per Second (cfs): 4.3

13. Horsepower Input to Motor: 110

14. Percent of Rated Motor Load (%): 104

15. Kilowatt Input to Motor: 82

16. KiloWatt-hours per Mill Gal: 707

17. Cost to Pump a Million Gal: \$77.78

18. Energy Cost (\$/hour) \$9.06

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 1,785

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 73

Remarks

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.

Overall efficiency of this plant is considered to be good assuming this run represents plant's normal operating condition.

This pump had a propeller type flow meter.

This pump has an adequate test section.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Current OPE is close to optimum - no savings estimated for a retrofit

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/14/2019
Pump: D BOOSTER # 2
Nameplate HP: 50.0
Our Pump Test Number: 4303152

This is a booster pump used for Municipal 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 5/14/2019 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:	72 %	75 %	
2. Nameplate Horsepower:	50.0 hp	50.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	90 %	90 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	53.4 hp	50.7 hp	
5. Motor loaded at:	96 %	92 %	
6. Flow rate (gpm):	942 gpm	942 gpm	
7. Inlet Water Level (ft):	-39 ft	-39 ft	
8. Discharge Pressure (psi):	86 psi	86 psi	
9. Total Dynamic Head (feet):	160 ft	159 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	56.37 mg/yr*	56.37 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	39,800 kWh/yr	37,800 kWh/yr	2,000 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	1,000 hr/yr	0 hr/yr
14. KiloWatt-Hours per Mill Gal:	704 kWh/mg	669 kWh/mg	35 kWh/mg
15. Average Cost Per Mill Gal:	\$77.45 \$/mg	\$73.56 \$/mg	\$3.89/mg = 5.03%
- Estimated savings = \$3.89/MG = 5.03% of energy costs - If pumping 56.37 mg/year this equals about \$220 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: D Booster # 2/Gigling Road **HP:** 50 **Utility:** PG&E
GPS Coord.: Long -121.7997 Lat 36.6464 **Pump Make:** Paco
Motor Make: Marathon **Type:** Centrifugal Pressure Bo **Meter Number:** 1009537207
Customer Addr: Marina Coast Water District
2480 Fourth Street
Marina, CA 93933 **Serial Number:** NONE
Voltage: 460 **Amps:** 60
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/14/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -39

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 86

6. Total Lift (ft): 160

7. Flow Velocity (ft/sec): 2.2

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

8. Measured Flow Rate (gpm): 942

9. Customer Flow Rate (gpm): 942

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 4.2

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

Million Gallons per 24 Hr: 1.357

12. Cubic Feet per Second (cfs): 2.1

13. Horsepower Input to Motor: 53

14. Percent of Rated Motor Load (%): 96

15. Kilowatt Input to Motor: 40

16. KiloWatt-hours per Mill Gal: 704

17. Cost to Pump a Million Gal: \$77.45

18. Energy Cost (\$/hour) \$4.38

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 1,755

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 72

Remarks

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.

Overall efficiency of this plant is considered to be good assuming this run represents plant's normal operating condition.

This pump had a propeller type flow meter.

This pump has an adequate test section.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Current OPE is close to optimum - no savings estimated for a retrofit

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/14/2019
Pump: E BOOSTER # 1
Nameplate HP: 10.0
Our Pump Test Number: 4303153

This is a booster pump used for Municipal 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 5/14/2019 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:	53 %	58 %	
2. Nameplate Horsepower:	10.0 hp	10.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	91 %	91 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	6.0 hp	10.6 hp	
5. Motor loaded at:	54 %	96 %	
6. Flow rate (gpm):	118 gpm	143 gpm	
7. Inlet Water Level (ft):	-34 ft	-34 ft	
8. Discharge Pressure (psi):	60 psi	88 psi	
9. Total Dynamic Head (feet):	105 ft	169 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	7.06 mg/yr*	7.06 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	4,450 kWh/yr	6,496 kWh/yr	-2,046 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	825 hr/yr	175 hr/yr
14. KiloWatt-Hours per Mill Gal:	628 kWh/mg	917 kWh/mg	-289 kWh/mg
15. Average Cost Per Mill Gal:	\$69.13 \$/mg	\$100.91 \$/mg	#####
- Estimated savings = (\$31.78)/MG = -45.97% of energy costs - If pumping 7.06 mg/year this equals about (\$225) 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: E booster # 1/NONE **HP:** 10 **Utility:** PG&E
GPS Coord.: **Long** -121.8008 **Lat** 36.6416 **Pump Make:** Flowserve
Motor Make: General Electric **Type:** Vertical Turbine Booster **Meter Number:** 1009537210
Customer Addr: Marina Coast Water District
2480 Fourth Street
Marina, CA 93933 **Serial Number:** NONE
Voltage: 460 **Amps:** 12.2
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/14/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -34

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 60

6. Total Lift (ft): 105

7. Flow Velocity (ft/sec): 3.9

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

8. Measured Flow Rate (gpm): 118

9. Customer Flow Rate (gpm): 0

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 0.5

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

Million Gallons per 24 Hr: 0.170

12. Cubic Feet per Second (cfs): 0.3

13. Horsepower Input to Motor: 6

14. Percent of Rated Motor Load (%): 54

15. Kilowatt Input to Motor: 4

16. KiloWatt-hours per Mill Gal: 628

17. Cost to Pump a Million Gal: \$69.13

18. Energy Cost (\$/hour) \$0.49

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 1,765

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 53

Remarks

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.

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/14/2019
Pump: E BOOSTER # 2
Nameplate HP: 10.0
Our Pump Test Number: 4303154

This is a booster pump used for Municipal 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 5/14/2019 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:	46 %	0 %	
2. Nameplate Horsepower:	10.0 hp	0.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	92 %	0 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	5.6 hp	0.0 hp	
5. Motor loaded at:	52 %	0 %	
6. Flow rate (gpm):	103 gpm	0 gpm	
7. Inlet Water Level (ft):	-34 ft	0 ft	
8. Discharge Pressure (psi):	58 psi	0 psi	
9. Total Dynamic Head (feet):	101 ft	0 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	0.00 mg/yr*	0.00 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	4,200 kWh/yr	0 kWh/yr	0 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	0 hr/yr	0 hr/yr
14. KiloWatt-Hours per Mill Gal:	680 kWh/mg	0 kWh/mg	0 kWh/mg
15. Average Cost Per Mill Gal:	\$74.75 \$/mg	\$0.00 \$/mg	\$74.75/mg = 100.00%
No calculation of annual savings because annual hours of operation not given.			

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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: E Booster # 2/NONE **HP:** 10 **Utility:** PG&E
GPS Coord.: **Long** -121.8008 **Lat** 36.6416 **Pump Make:** Flowserve
Motor Make: General Electric **Type:** Turbine Pressure Boost **Meter Number:** 1009537210
Customer Addr: Marina Coast Water District
2480 Fourth Street
Marina, CA 93933 **Serial Number:** NONE
Voltage: 460 **Amps:** 12.2
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/14/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -34

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 58

6. Total Lift (ft): 101

7. Flow Velocity (ft/sec): 3.4

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

8. Measured Flow Rate (gpm): 103

9. Customer Flow Rate (gpm): 0

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 0.5

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

Million Gallons per 24 Hr: 0.148

12. Cubic Feet per Second (cfs): 0.2

13. Horsepower Input to Motor: 6

14. Percent of Rated Motor Load (%): 52

15. Kilowatt Input to Motor: 4

16. KiloWatt-hours per Mill Gal: 680

17. Cost to Pump a Million Gal: \$74.75

18. Energy Cost (\$/hour) \$0.46

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 1,765

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 46

Remarks

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.

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/14/2019
Pump: E- BOOSTER # 3
Nameplate HP: 10.0
Our Pump Test Number: 4303155

This is a booster pump used for Municipal 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 5/14/2019 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:	59 %	0 %	
2. Nameplate Horsepower:	10.0 hp	0.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	92 %	0 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	5.6 hp	0.0 hp	
5. Motor loaded at:	52 %	0 %	
6. Flow rate (gpm):	106 gpm	0 gpm	
7. Inlet Water Level (ft):	-21 ft	0 ft	
8. Discharge Pressure (psi):	62 psi	0 psi	
9. Total Dynamic Head (feet):	123 ft	0 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	0.00 mg/yr*	0.00 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	4,200 kWh/yr	0 kWh/yr	0 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	0 hr/yr	0 hr/yr
14. KiloWatt-Hours per Mill Gal:	662 kWh/mg	0 kWh/mg	0 kWh/mg
15. Average Cost Per Mill Gal:	\$72.84 \$/mg	\$0.00 \$/mg	\$72.84/mg = 100.00%
No calculation of annual savings because annual hours of operation not given.			

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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: E- Booster # 3/NONE **HP:** 10 **Utility:** PG&E
GPS Coord.: **Long** -121.8008 **Lat** 36.6412 **Pump Make:** Flowserve
Motor Make: General Electric **Type:** Turbine Pressure Boost **Meter Number:** 1009537210
Customer Addr: Marina Coast Water District
2480 Fourth Street
Marina, CA 93933 **Serial Number:** NONE
Voltage: 460 **Amps:** 12.2
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/14/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -21

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 62

6. Total Lift (ft): 123

7. Flow Velocity (ft/sec): 3.5

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

8. Measured Flow Rate (gpm): 106

9. Customer Flow Rate (gpm): 0

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 0.5

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

Million Gallons per 24 Hr: 0.152

12. Cubic Feet per Second (cfs): 0.2

13. Horsepower Input to Motor: 6

14. Percent of Rated Motor Load (%): 52

15. Kilowatt Input to Motor: 4

16. KiloWatt-hours per Mill Gal: 662

17. Cost to Pump a Million Gal: \$72.84

18. Energy Cost (\$/hour) \$0.46

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 1,765

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 59

Remarks

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.

Overall efficiency of this plant is considered to be good assuming this run represents plant's normal operating condition.

This pump has an adequate test section.

This pump had a digital flow meter.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Current OPE is close to optimum - no savings estimated for a retrofit

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/14/2019
Pump: F BOOSTER #2
Nameplate HP: 150.0
Our Pump Test Number: 4303150

This is a booster pump used for Municipal 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 5/14/2019 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:	58 %	69 %	
2. Nameplate Horsepower:	150.0 hp	150.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	92 %	92 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	139.0 hp	153.6 hp	
5. Motor loaded at:	85 %	94 %	
6. Flow rate (gpm):	1,572 gpm	1,713 gpm	
7. Inlet Water Level (ft):	-18 ft	-18 ft	
8. Discharge Pressure (psi):	96 psi	114 psi	
9. Total Dynamic Head (feet):	204 ft	245 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	94.07 mg/yr*	94.07 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	103,700 kWh/yr	105,145 kWh/yr	-1,445 kWh/yr
13. Hours of Operation/yr:	1,000 hr/yr*	917 hr/yr	83 hr/yr
14. KiloWatt-Hours per Mill Gal:	1,099 kWh/mg	1,115 kWh/mg	-15 kWh/mg
15. Average Cost Per Mill Gal:	\$120.93 \$/mg	\$122.61 \$/mg	(\$1.69)/mg = -1.39%
- Estimated savings = (\$1.69)/MG = -1.39% of energy costs - If pumping 94.07 mg/year this equals about (\$159) 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location: F Booster #2/Old County Road **HP:** 150 **Utility:** PG&E
GPS Coord.: **Long** -121.7582 **Lat** 36.66253 **Pump Make:** Paco
Motor Make: General Electric **Type:** Centrifugal Pressure Bo **Meter Number:** 1009539689
Customer Addr: Marina Coast Water District **Serial Number:** NONE
2480 Fourth Street **Voltage:** 460 **Amps:** 173
Marina, CA 93933
Contact: Derick Cray **Our Test #:**
Phone: (831) 883-5903 **Fax:** (831) 384-2479 **Cell:** (831) 333-6470

Test Results

Test Date: 5/14/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

If line 1 is negative then pump inlet is under pressure.

1. Inlet Water Level (ft): -18

2. Standing Water Level (ft): NA

3. Draw Down (ft): NA

4. Recovered Water Level (ft): NA

5. Discharge Pressure at Gauge (psi): 96

6. Total Lift (ft): 204

7. Flow Velocity (ft/sec): 13.5

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

8. Measured Flow Rate (gpm): 1,572

9. Customer Flow Rate (gpm): 1,539

10. Specific Capacity (gpm/ft draw): NA

11. Acre Feet per 24 Hr: 6.9

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

Million Gallons per 24 Hr: 2.264

12. Cubic Feet per Second (cfs): 3.5

13. Horsepower Input to Motor: 139

14. Percent of Rated Motor Load (%): 85

15. Kilowatt Input to Motor: 104

16. KiloWatt-hours per Mill Gal: 1,099

17. Cost to Pump a Million Gal: \$120.93

18. Energy Cost (\$/hour) \$11.41

19. Base Cost per Kwh: \$0.110

20. Nameplate rpm: 3,560

21. rpm at Gearhead: 0

22. Overall Pumping Efficiency (%): 58

Remarks

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.

Overall efficiency of this plant is considered to be fair assuming this run represents plant's normal operating condition.

This pump had a propeller type flow meter.

This pump has an adequate test section.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Estimated savings of -5 kWh/AF and (\$158.99) annual energy costs from a retrofit

Current OPE of 58% and estimated potential OPE of 69%

CONFIDENTIAL AND PROPRIETARY INFORMATION
PUMPING COST ANALYSIS FROM: Craig Evans Pump Testing Services

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 5/13/2019
Pump: WELL #10
Nameplate HP: 250.0
Our Pump Test Number: 4303138

This is a water well used for Municipal and assumed to be operated 2911 hours/year.

The following Pumping Cost Analysis is presented as an estimate prepared from data acquired from the pump test performed 5/13/2019 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:	63 %	70 %	
2. Nameplate Horsepower:	250.0 hp	300.0 hp	<i>Note Change!</i>
3. Motor Efficiency:	93 %	93 %	<i>Note Change!</i>
4. Actual Motor Input Horsepower:	226.1 hp	306.6 hp	
5. Motor loaded at:	84 %	95 %	
6. Flow rate (gpm):	1,431 gpm	1,937 gpm	
7. Pumping Level (ft):	341 ft	388 ft	
8. Discharge Pressure (psi):	22 psi	22 psi	
9. Total Dynamic Head (feet):	393 ft	439 ft	<i>Rounded TDH = line 7. + (2.31 x line 8.)</i>
10. Million Gallons Pumped/year:	249.27 mg/yr*	249.27 mg/yr*	<i>Same mg/yr AFTER!</i>
11. Average Cost per kWh:	\$0.110 /kWh*	\$0.110 /kWh*	<i>Same \$/kWh AFTER</i>
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	491,086 kWh/yr	491,930 kWh/yr	-845 kWh/yr
13. Hours of Operation/yr:	2,911 hr/yr*	2,151 hr/yr	760 hr/yr
14. KiloWatt-Hours per Mill Gal:	1,965 kWh/mg	1,968 kWh/mg	-3 kWh/mg
15. Average Cost Per Mill Gal:	\$216.11 \$/mg	\$216.48 \$/mg	(\$0.37)/mg = -0.17%
- Estimated savings = (\$0.37)/MG = -0.17% of energy costs - If pumping 249.27 mg/year this equals about (\$93) 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.5.4 2/4/2014

Customer and Facility Data

Pump/Location:	Well #10/Bayer Drive	HP:	250	Utility:	PG&E
GPS Coord.:	Long -121.7825	Lat 36.6717	Pump Make:	Flowserve	
Motor Make:	U.S.	Type: Well	Meter Number:	5000118887	
Customer Addr:	Marina Coast Water District	Serial Number:	NONE		
	2480 Fourth Street	Voltage: 460	Amps: 295		
	Marina, CA 93933				
Contact:	Derick Cray	Our Test #:			
Phone: (831) 883-5903	Fax: (831) 384-2479	Cell: (831) 333-6470			

Test Results

Test Date: 5/13/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

1. Pumping Water Level (ft):	341
2. Standing Water Level (ft):	208
3. Draw Down (ft):	133
4. Recovered Water Level (ft):	208
5. Discharge Pressure at Gauge (psi):	22
6. Total Lift (ft):	393
7. Flow Velocity (ft/sec):	4.7
8. Measured Flow Rate (gpm):	1,431
9. Customer Flow Rate (gpm):	1,450
10. Specific Capacity (gpm/ft draw):	10.8
11. Acre Feet per 24 Hr:	6.3
Million Gallons per 24 Hr:	2.061
12. Cubic Feet per Second (cfs):	3.2
13. Horsepower Input to Motor:	226
14. Percent of Rated Motor Load (%):	84
15. Kilowatt Input to Motor:	169
16. KiloWatt-hours per Mill Gal:	1,965
17. Cost to Pump a Million Gal:	\$216.11
18. Energy Cost (\$/hour)	\$18.56
19. Base Cost per Kwh:	\$0.110
20. Nameplate rpm:	1,780
21. rpm at Gearhead:	0
22. Overall Pumping Efficiency (%):	63

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).

Remarks

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.

Overall efficiency of this plant is considered to be good assuming this run represents plant's normal operating condition.

This pump has an adequate test section.

This pump had a propeller type flow meter.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Pump started for test, pumping water level could still be drawing down.

Estimated savings of -1 kWh/AF and (\$92.90) annual energy costs from a retrofit

Current OPE of 63% and estimated potential OPE of 70%

How to Participate in the Advanced Pumping Efficiency Program:



EDUCATIONAL SEMINARS

Seminars are free-of-charge. Our seminar schedule is on the Events Calendar on our web site (www.pumpefficiency.org) or you can call the main office. Also, all of our educational materials are on the web site and can be downloaded free-of-charge. We are always looking for partners for our seminars and if your organization has an event that we might be able to help with, please give us a call - 1 800 845-6038.

TECHNICAL ASSISTANCE

We are always available to help you interpret a pump test report, fill out an incentive application, discuss other PG&E energy efficiency programs, or answer general questions regarding design and management of pumping systems. Please note that we cannot supply site-specific engineering services.

SUBSIDIZED PUMP EFFICIENCY TESTS

If you are reading this then you already know how to obtain a subsidized test from APEP. Please tell your friends and neighbors about our Program. The pump efficiency test is the first step in maintaining an efficient pumping plant. Please note that subsidies depend on available funding and are on a first-come, first-served basis.

CASH INCENTIVES FOR PUMP RETROFITS

If you are thinking of retrofitting a pumping plant to improve efficiency we may be able to provide a cash incentive (again depending on available funding). The actual incentive depends on your annual energy use and the maximum incentive allowed is 50% of the total project cost. Some important eligibility factors include:

- we need a copy of pump tests performed both before and after the project. They cannot be more than 3 years apart. An application must be complete and approved within 2 years after the post-project test. These tests do not have to have been done by APEP testers but we must feel they are accurate.
- the ONLY eligible project is a retrofit or replacement of either or both of the pump bowl or impeller.
- we can accept an incentive application for a project after the fact (i.e., the project has already been completed before you fill out the application). Again though, the application has to be complete and approved within 2 years after the post-project pump test.

Ineligible projects include:

- replacement of the motor only.
- installation of a variable frequency drive (although check with your PG&E rep for other applicable energy efficiency programs).
- a simple pump impeller adjustment.
- construction, rehabilitation, or finishing of a water well (although check with your PG&E rep for other applicable energy efficiency programs).
- retrofits intended to change the operational purpose of the pump (e.g., changing a well pump from low pressure flood irrigation to high pressure drip irrigation).
- multi-pump projects, unless the system is a booster pump in series with a water well.
- projects intended to reduce the total dynamic head in the system (e.g., remove a throttling valve.)

The APEP Policies and Procedures manual that contains all eligibility factors and incentive application forms for either electric or natural gas-powered pumping plants are on the web site. Please call one of the APEP offices to discuss any project you think might be eligible for the program incentives.

PG&E and other utilities and agencies have many energy efficiency programs available. Call your account representative, go to the PG&E web site at www.pge.com, or go to www.californiaenergyefficiency.com for more information.

Again, we appreciate your participation in the Program.

Advanced Pumping Efficiency Program



Dear PG&E Pumping Customer:

Thank you for participating in the Advanced Pumping Efficiency Program (APEP). APEP is funded through PG&E's energy efficiency programs to support energy efficient pumping. APEP offers subsidized pump efficiency tests, cash incentives for pump retrofits, education, and technical assistance. Please look at the last page of this report as it shows how you can participate in all facets of the program, including the incentives for pump retrofits.

The APEP program provides subsidies to pump test companies so that they can provide their services at reduced costs to PG&E customers with eligible pumps. It is important to note that the subsidy may not cover the total cost of the test and you may be charged an additional fee by the test company.

Once you have received your pump test results, please sign the Record of Pump Efficiency Test at the bottom of this page so that the subsidy can be released to the pump tester.

The test report you have just received includes important information concerning your pump's performance. It includes an estimate of the energy and utility bill savings you could achieve by improving your pump's performance through a retrofit or replacement. Your pump tester or pump service company can supply you with an APEP program pamphlet explaining more about the test and what it tells you. They should also be able to help you determine if a pump retrofit would be economical for you at this time.

The APEP Program also provides cash incentives to PG&E customers to help offset costs in retrofitting or replacing inefficient pumping systems. Your pump tester, pump service company, PG&E representative, or the APEP Program Office can supply you with an application form and explain the important requirements and eligibility factors. Log on to the APEP Program web site at WWW.PUMPEFFICIENCY.ORG to learn more and download an application. You may also call 1(800) 845-6038 to speak with an APEP Program representative from 8am-5pm, Monday through Friday. Program representatives are available to provide technical assistance in filling out the incentive application, locate participating pump testers or pump repair companies, answer general questions about pumps and pumping, and provide information concerning other PG&E energy efficiency programs that might be available to you.

Finally, the APEP Program offers free educational seminars on pumping efficiency throughout the state. Check the calendar of events on the website listed above that shows when and where our educational seminars are being held.

Sincerely,

Peter Canessa, Program Manager

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: Craig Evans Pump Testing Services

I certify that I performed test # 4303201 on 7/18/2019 on the pump serviced by meter: PG&E 1006728198

Pump Name: Watkins Gate Well Tester: Craig Evans 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): Derick Cray

Title: _____

Business: Marina Coast Water District

Signed: _____

Date: _____ Phone: 8318835903

**CONFIDENTIAL AND PROPRIETARY INFORMATION PUMPING COST
ANALYSIS FROM: Craig Evans Pump Testing Services**

DERICK CRAY
MARINA COAST WATER DISTRICT
2480 FOURTH STREET
MARINA, CA 93933

Test Date: 7/18/2019
Pump: WATKINS GATE WELL
Nameplate HP: 350.0
Our Pump Test Number: 4303201

This is a Well pump used for Municipal and assumed to be operated 10 hours/year.

The current OPE is high enough that little or no cost savings are estimated from a retrofit/repair.

NOTE: * denotes a value that was Assumed or Provided by Customer	Measured Pump Condition	Assumed Condition After Retrofit	Notes
1. Overall pumping efficiency:	68 %	68 %	
2. Nameplate Horsepower:	350.0 hp	350.0 hp	
3. Motor Efficiency:	95 %	95 %	
4. Actual Motor Input Horsepower:	339.1 hp	339.1 hp	
5. Motor loaded at:	92 %	92 %	
6. Flow rate (gpm):	2,200 gpm	2,200 gpm	
7. Pumping Level (ft):	243 ft	243 ft	
8. Discharge Pressure (psi):	75 psi	75 psi	
9. Total Dynamic Head (feet):	416 ft	416 ft	Rounded TDH = line 7. + (2.31 x line 8.)
10. Million Gallons Pumped/Year:	1.32 mg/Yr*	1.32 mg/Yr*	Same mg/yr AFTER!
11. Average Cost per kWh:	\$0.160 /kWh*	\$0.160 /kWh*	Same \$/kWh AFTER
			Estimated Savings from Retrofit
12. Estimated Total kWh per Year:	2,530 kWh/yr	2,530 kWh/yr	0 kWh/yr
13. Hours of Operation/yr:	10 hr/yr*	10 hr/yr	0 hr/yr
14. Kilowatt-Hours per mill gal:	1,917 kWh/mg	1,917 kWh/mg	0 kWh/mg
15. Average Cost Per mill gal:	\$306.64 \$/mg	\$306.64 \$/mg	\$0.00/mg = 0.00%
- Estimated savings = \$0.00/mg = 0.00% of energy costs - If pumping 1.32 mg/year this equals about \$0 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 Craig Evans at 8319150167.

Regards,

Craig Evans



Craig Evans Pump Testing Services

(831) 915-0167

Pump Test Report

v.6.0 9/2014

Customer and Facility Data

Pump/Location:	Watkins Gate Well/Reservation Road	HP:	350	Utility:	PG&E
GPS Coord.:	Long 0	Lat 0	Pump Make:	Flowserve	
Motor Make:	U.S.	Type:	Well	Meter Number:	1006728198
Customer Addr:	Marina Coast Water District	Serial Number:	NONE		
	2480 Fourth Street	Voltage:	460	Amps:	365
	Marina, CA 93933				
Contact:	Derick Cray	Our Test #:			
Phone:	(831) 883-5903	Fax:	(831) 384-2479	Cell:	(831) 333-6470

Test Results

Test Date: 7/18/2019

Tester: Craig Evans

Run Number ('E' = used for cost anal): E-1

1. Pumping Water Level (ft):	243
2. Standing Water Level (ft):	75
3. Draw Down (ft):	168
4. Recovered Water Level (ft):	75
5. Discharge Pressure at Gauge (psi):	75
6. Total Lift (ft):	416
7. Flow Velocity (ft/sec):	7.7
8. Measured Flow Rate (gpm):	2,200
9. Customer Flow Rate (gpm):	2,297
10. Specific Capacity (gpm/ft draw):	13.1
11. Acre Feet per 24 Hr:	9.7
Million Gallons per 24 Hr:	3.168
12. Cubic Feet per Second (cfs):	4.9
13. Horsepower Input to Motor:	339
14. Percent of Rated Motor Load (%):	92
15. Kilowatt Input to Motor:	253
16. Kilowatt-hours per mill gal:	1,917
17. Cost to Pump a million gal:	\$306.64
18. Energy Cost (\$/hour)	\$40.48
19. Base Cost per Kwh:	\$0.160
20. Nameplate rpm:	1,780
21. rpm at Gearhead:	0
22. Overall Pumping Efficiency (%):	68

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).

Remarks

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.

Overall efficiency of this plant is considered to be very good assuming this run represents plant's normal operating condition.

Test results may be impaired due to poor hydraulic test section.

This pump had a propeller type flow meter.

The overall pump efficiency is underestimated because computations do not include the pressure loss in the column, screen, foo

Current OPE is close to optimum - no savings estimated for a retrofit

How to Participate in the Advanced Pumping Efficiency Program:



EDUCATIONAL SEMINARS

Seminars are free-of-charge. Our seminar schedule is on the Events Calendar on our web site (www.pumpefficiency.org) or you can call the main office. Also, all of our educational materials are on the web site and can be downloaded free-of-charge. We are always looking for partners for our seminars and if your organization has an event that we might be able to help with, please give us a call - 1 800 845-6038.

TECHNICAL ASSISTANCE

We are always available to help you interpret a pump test report, fill out an incentive application, discuss other PG&E energy efficiency programs, or answer general questions regarding design and management of pumping systems. Please note that we cannot supply site-specific engineering services.

SUBSIDIZED PUMP EFFICIENCY TESTS

If you are reading this then you already know how to obtain a subsidized test from APEP. Please tell your friends and neighbors about our Program. The pump efficiency test is the first step in maintaining an efficient pumping plant. Please note that subsidies depend on available funding and are on a first-come, first-served basis.

CASH INCENTIVES FOR PUMP RETROFITS

If you are thinking of retrofitting a pumping plant to improve efficiency we may be able to provide a cash incentive (again depending on available funding). The actual incentive depends on your annual energy use and the maximum incentive allowed is 50% of the total project cost. Some important eligibility factors include:

- we need a copy of pump tests performed both before and after the project. They cannot be more than 3 years apart. An application must be complete and approved within 2 years after the post-project test. These tests do not have to have been done by APEP testers but we must feel they are accurate.
- the ONLY eligible project is a retrofit or replacement of either or both of the pump bowl or impeller.
- we can accept an incentive application for a project after the fact (i.e., the project has already been completed before you fill out the application). Again though, the application has to be complete and approved within 2 years after the post-project pump test.

Ineligible projects include:

- replacement of the motor only.
- installation of a variable frequency drive (although check with your PG&E rep for other energy efficiency programs that may allow for this).
- a simple pump impeller adjustment.
- construction, rehabilitation, or finishing of a water well (although check with your PG&E rep for other applicable energy efficiency programs).
- retrofits intended to change the operational purpose of the pump (e.g., changing a well pump from low pressure flood irrigation to high pressure drip irrigation).
- multi-pump projects, unless the system is a booster pump in series with a water well.
- projects intended to reduce the total dynamic head in the system (e.g., remove a throttling valve.)

The APEP Policies and Procedures manual that contains all eligibility factors and incentive application forms for either electric or natural gas-powered pumping plants are on the web site. Please call one of the APEP offices to discuss any project you think might be eligible for the program incentives.

PG&E and other utilities and agencies have many energy efficiency programs available. Call your account representative, go to the PG&E web site at www.pge.com, or go to www.californiaenergyefficiency.com for more information.

Again, we appreciate your participation in the Program.