



ENERGY AND GREEN HOUSE GAS Benchmark Study



JULY 2009

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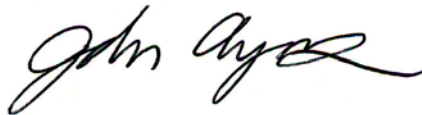
Subject: Energy and Greenhouse Gas Benchmark Study

Dear Mr. Martin:

Brown and Caldwell is pleased to submit this final report for your review. Please do not hesitate to contact me if you have any questions or comments.

Sincerely,

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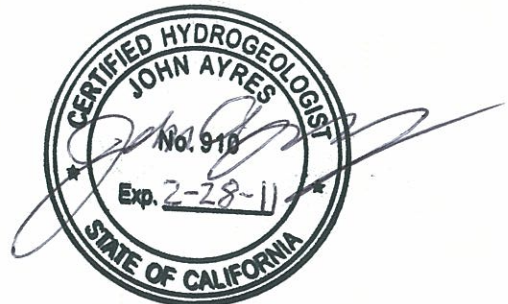
Enclosure

ENERGY AND GREENHOUSE GAS BENCHMARK STUDY

Prepared for
Placer County Water Agency
July 2009

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LIST OF ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ac-ft	acre-feet
ARPS	American River Pump Station
ATPS	Auburn Tunnel Pump Station
BMP	best management practices
CAFE	Corporate Average Fuel Economy
CARB	California State Air Resources Board
CCAR	California Climate Action Registry
CFC	chlorofluorocarbons
cfs	cubic feet per second
CHP	combined heat and power
CO ₂	carbon dioxide
CO _{2e}	carbon dioxide equivalent
CPUC	California Public Utilities Commission
CREBS	Clean Energy Renewable Bonds
CSI	California Solar Initiative
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DOE	Department of Energy
GHG	greenhouse gas
GNG	Compressed Natural Gas
gpm	gallons per minute
HCFC	hydro chlorofluorocarbons
HEB	Hybrid Electric Vehicle
HVAC	heat, ventilation and air conditioning
KW	kilowatts
kWh	kilowatt hour
LED	light-emitting diode
LPG	liquified petroleum gas
MFP	Middle Fork Project
MGD	million gallons per day
MOU	Memorandum of Understanding
MW	megawatts
NEG	net excess generation
NEMA	National Electric Manufacturer's Association
NO _x	nitrogen oxide
NREL	National Renewable Energy Laboratory
NRNC	Non-Residential New Construction
O ₂	oxygen
OSA	outside air
PCWA	Placer County Water Agency
PG&E	Pacific Gas & Electric
PRS	pressure reducing station
PRV	pressure reducing valves
PV	photovoltaic
RECs	renewable-energy credits

RFS	Renewable Fuels Standard
RPS	Renewables Portfolio Standard
SGIP	Self Generation Incentive Program
SNC	Sierra Nevada Conservatory
TES	thermal energy storage
unk	unknown
UV	ultraviolet
VFD	variable frequency drive
WAPA	Western Area Power Authority
WTP	water treatment plant

ENERGY AND GREENHOUSE GAS BENCHMARK STUDY

1. INTRODUCTION

This report addresses the energy use, greenhouse gas (GHG) emissions, and reduction strategies available to Placer County Water Agency (PCWA). This section describes the report purpose, PCWA water system, and document organization.

1.1 Report Purpose

Energy efficiency and GHG emissions issues are recently gaining more attention from the water industry and the general public at large. There is a strong relationship between water and energy conservation. The cost of energy represents an increasing portion of the overall cost of delivered water.

The PCWA Board of Directors has a strong interest in being a regional leader among water agencies on the issues of climate change, carbon footprint, greenhouse gas emissions, biomass management, and energy efficiency, just as it has been with water use efficiency. PCWA officials want to gain a more thorough understanding of the energy use by PCWA, the energy costs that are embedded in the costs of water delivery, and the implications of climate change to PCWA.

This work is being developed utilizing a phased process. This first phase is focused on gathering background information, benchmarking PCWA's energy use, inventorying GHG emissions, and developing energy and GHG emissions options. This report represents the results of the Phase 1 effort.

Subsequent phases will screen energy efficiency and GHG options, select the options, and implement the selected options.

1.2 Description of PCWA Water System

PCWA serves approximately 36,100 connections and a population of approximately 135,900 in 2004. The PCWA service area is divided into four service zones. Surface water is the only supply source, except for a small amount of groundwater that is used to supply Zone 4, near Truckee, CA. Zones 1, 3, and 5 are located in western Placer County, where most of PCWA's customers are located. The PCWA system in those three zones includes eight water treatment plants (WTPs).

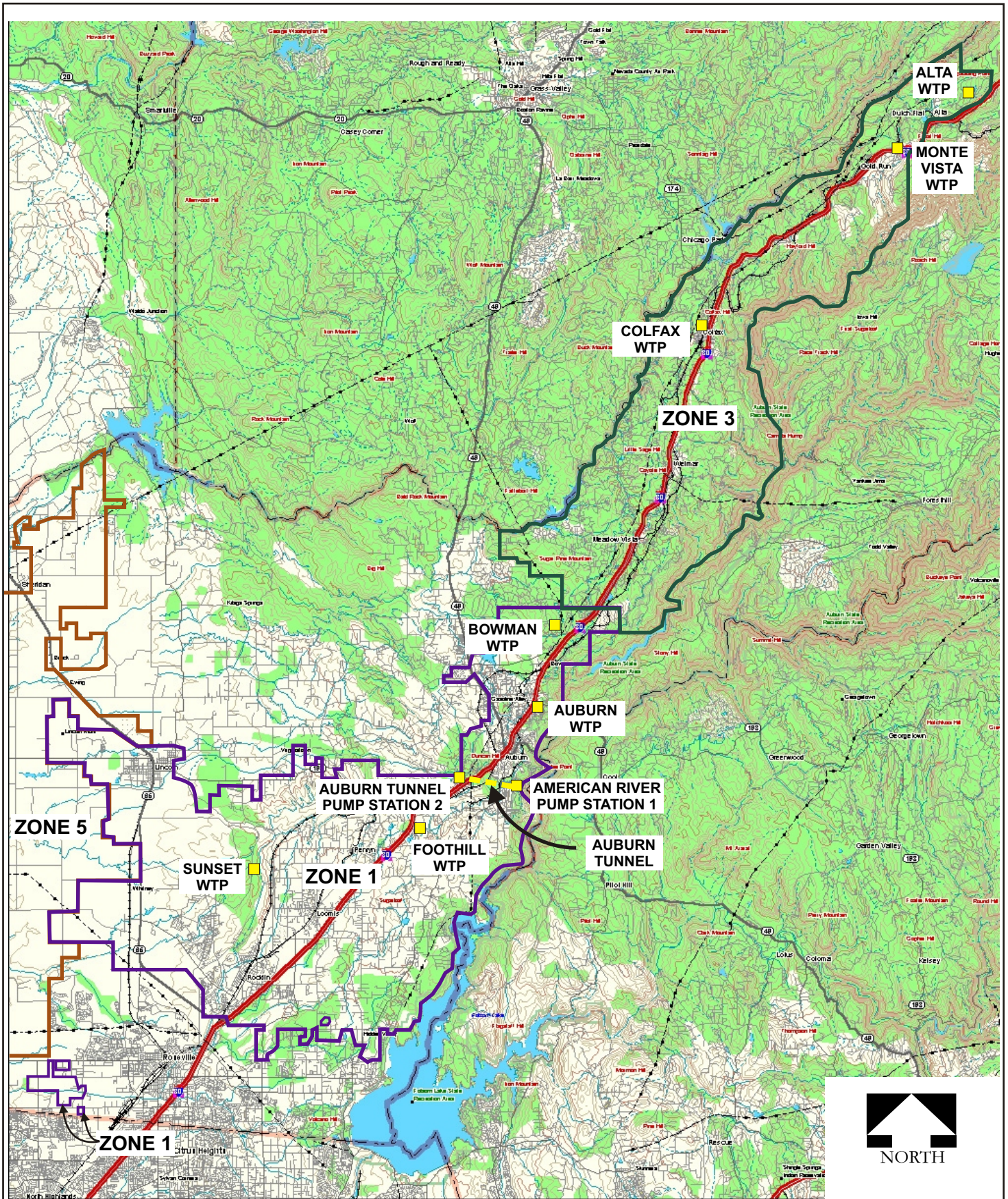
PCWA's surface water supply sources consist of Middle Fork Project (MFP) water from the American River, water purchased from Pacific Gas & Electric (PG&E) from the Yuba and Bear Rivers, a water right from Canyon Creek, and Central Valley Project (CVP) water from the American River. Most of the water that is currently used is the PG&E contract water. The PG&E water is mostly supplied via gravity through a reservoir and ditch system that flows off of the Sierra foothills. All of the MFP and CVP water must be pumped up into the water system.

PCWA supplied approximately 32,700 acre-feet (ac-ft) of water to its treated water retail customers in 2007, which includes the water supplied to Lincoln. An additional 81,500 ac-ft of water was supplied to raw water customers in 2007. PCWA also wholesales water to other agencies, although this water is not diverted or treated by PCWA facilities. Figure 1-1 depicts the PCWA zones and Figure 1-2 depicts the locations of the key water pumping and treatment facilities.



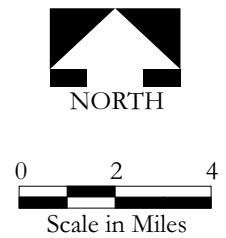
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10-7-08

SITE
TITLE

PCWA Energy Benchmark Study
Placer County, California
Key Facilities

Figure
1-2

Table 1-1 presents information on PCWA's larger water facilities. Each of the service zones is described below.

Table 1-1. PCWA Facilities			
Category	Facility	Capacity	Description
Pump Stations	Auburn Tunnel Pump Station	48 cfs	Pumps water from the Auburn Tunnel to the South Canal
	Rock Creek Pump Station	21 cfs	Pumps water during the PG&E water outage to Fiddler Green Canal
	Laird Pump Station	450 gpm	Pumps raw water
	American River Pump Station	148 cfs	Pumps water from the American River to the Auburn Tunnel
	Skyridge Pump Station	1,300 gpm	Pumps to Skyridge storage tank
	Stoneridge Pump Station	3,000 gpm	Pumps during summer to retain distribution pressure
	Sunset Pumps	1,300 gpm	Pumps to Sunset WTP
	Tinker Road Pump Station	unk	Pumps water into the 350 zone and to Roseville
	Turner Pump Station	350 gpm	Pumps water for irrigation use
	North Auburn Pump Station	1,000 gpm	unk
	North Star Pump Station	700 gpm	Located in Rocklin
Water Treatment Plants	Alta WTP	0.43 MGD	Treated water used in Zone 3 distribution, serves Alta
	Applegate WTP	0.065 MGD	Treated water used in Zone 3 distribution, serves Applegate
	Auburn WTP	6 MGD	Treated water used in Zone 1 distribution, serves Auburn, Bowman, Ophir, and Newcastle
	Bowman WTP	7 MGD	Treated water used in Zone 1 distribution, serves Auburn, Bowman, Ophir, and Newcastle
	Colfax WTP	1.4 MGD	Treated water used in Zone 3 distribution, serves Colfax
	Foothill WTP	55 MGD	Treated water used in Zone 1 distribution, serves Penryn, Loomis, Rocklin, and Lincoln
	Monte Vista WTP	0.108 MGD	Treated water used in Zone 3 distribution, serves Monte Vista
	Sunset WTP	8 MGD	Treated water used in Zone 1 distribution, serves Penryn, Loomis, Rocklin, and Lincoln, capacity currently limited by canal size

Zone 1

Zone 1 is the largest of the five zones, providing water service to Auburn, Bowman, Ophir, Newcastle, Penryn, Loomis, Rocklin, Lincoln, and portions of Granite Bay. Zone 1 includes four water treatment facilities.

The source of water for Zone 1 facilities comes from either PG&E's Wise/South Canal, PCWA's Boardman Canal, or from the American River. This water is used to supply the PCWA's Bowman, Auburn, Foothill, and Sunset Water Treatment Plants as well as raw water customers.

The Auburn and Bowman WTPs are located in the northern part of Zone 1 and serve the Auburn, Bowman, Ophir, and Newcastle areas of Placer County. The facilities treat surface water from the Bear River through the Boardman, Wise, and South Canals.

The Foothill and Sunset WTPs are located in the southern part of Zone 1 and serve the communities of Penryn, Loomis, Rocklin, Lincoln, and a portion of Granite Bay. The facilities treat surface water from the Wise/South and Caperton Canals. The Foothill WTP is used as the primary treatment facility. The Sunset

WTP is typically operated during the peak summer months and during outages in the PG&E supply to the Foothill WTP.

Water can be supplied to lower Zone 1 from the American River by operating pumps located near the proposed Auburn Dam site at the American River Pump Station (ARPS). These pumps lift water from the river to the inlet of the Auburn Tunnel. The Auburn Tunnel is a 3-mile long tunnel that connects the American River Canyon with Auburn Ravine near the town of Ophir. In addition to being able to supply American River water to Auburn Ravine, PCWA is also able to supply water to PG&E's South Canal during PG&E annual outages by operating pumps at the Auburn Tunnel Pump Station (ATPS) that intercept the tunnel and pump water to the surface and discharge it into PG&E's South Canal.

Zone 2

Zone 2 consists of the Bianchi Estates water system that serves a small subdivision directly south of Baseline Road. The system is serving approximately 46 connections with an estimated population of 152. Zone 2 receives wheeled water from Zone 1 through Roseville's water facilities.

Zone 3

Zone 3 includes four treatment facilities and provides water services to the communities of Monte Vista, Alta, Applegate, and Colfax.

The Monte Vista WTP is located in the northern part of Zone 3 and services the community of Monte Vista. The facility treats surface water from Cedar Creek Canal.

The Alta WTP is located in the northern part of Zone 3 and services the community of Alta. The facility treats surface water from the PG&E's Alta forebay.

The Applegate WTP is located in the southern part of Zone 3 and services a small portion of the community of Applegate. The facility treats surface water from the Boardman Canal and provides an estimated 31 ac-ft of treated water annually.

The Colfax WTP is centrally located in Zone 3 and services the community of Colfax. The facility treats surface water from the Boardman Canal.

The source of water for Zone 3 customers comes from PG&E. PCWA purchases water from PG&E at various buy points. PCWA's Boardman Canal, beginning near Alta, extends along the I-80 corridor to Zone 3 near Lake Theodore. From the Boardman Canal, water is delivered to the four PCWA WTP facilities located within Zone 3, other community water districts, and PCWA's raw water customers.

Zone 4

The Zone 4 system consists of three water wells within the Lahontan development and Timilick development and serves communities south of Truckee. The key water facilities within Zone 4 include three wells, several water storage tanks, and approximately 8.2 miles of treated water distribution system piping.

Zone 5

Zone 5 includes all areas of west Placer County outside of PCWA Zone 1 or other water provider service areas. Only raw water is distributed within Zone 5 to agricultural customers located near Auburn Ravine, which is delivered via Auburn Ravine to canals and creeks that traverse the area.

1.3 Document Organization

This report is organized into the following sections:

- Section 1 Introduction: discusses report purpose and the PCWA water system and facilities.
- Section 2 Current and Anticipated Energy Use and Cost: describes current and future energy use and PG&E rate structures.
- Section 3 Current Greenhouse Gas Emissions: quantifies greenhouse gas emissions by PCWA and discusses emission avoidance by power generation at PCWA hydropower facilities.
- Section 4 Energy and GHG Conservation: describes existing conservation, the linkage between water conservation and energy conservation, potential energy conservation, and potential GHG conservation.
- Section 5 Alternative Energy Sources: describes and recommends energy generation alternatives, including: solar, wind, hydroelectric, biomass, and geothermal alternatives.
- Section 6 Funding Opportunities: describes and recommends federal, state, and PG&E funding programs.
- Section 7 Conclusions and Recommendations: identifies recommended strategies for energy and GHG conservation, alternative energy generation, and funding.
- Section 8 References: provides document references
- Appendices: several appendices provide detail regarding electrical accounts, cost, and rate schedules; greenhouse gas emissions; solar projects, and water conservation efforts.

ENERGY AND GREENHOUSE GAS BENCHMARK STUDY

2. CURRENT AND ANTICIPATED ENERGY USE AND COST

This section describes current and anticipated energy use by PCWA. Current energy use was compiled, analyzed, and reported by cost, source, and facility category. Anticipated future energy use is estimated for water deliveries at system buildout, and electric rate schedules are summarized and evaluated.

2.1 Current Energy Use

Energy use for the years 2006 and 2007 are quantified by collecting and assessing 2006 and 2007 energy use records and billing information from the Agency. The following subsections present the approach and methodology for quantifying energy use, the amount of energy use, energy costs for 2006 and 2007, and the amount of power generated.

2.1.1 Approach and Methodology

PCWA utilizes energy from a number of sources including electricity, natural gas, propane, diesel, and gasoline. This study quantified electricity use by obtaining and reviewing 2006 and 2007 electricity bills from PG&E, Sierra Pacific Power, and the City of Roseville. Propane and natural gas use was quantified by obtaining and reviewing gas bills from PG&E, Southwest Gas, and Suburban Propane. Diesel and gasoline use was quantified using PCWA's internal fleet vehicle and equipment log summaries.

Energy records were compiled and analyzed in Microsoft Excel spreadsheets. Monthly electrical bills were compiled and totaled for 2006 and 2007 annual totals. Energy bill calculations are presented in Appendix A.

2.1.2 Results

The majority of PCWA energy use in 2006 and 2007 was purchased electricity, and diesel and gasoline use, as shown in Table 2-1. Electricity use accounted for 76 percent (%) and diesel and gasoline use accounted for 22% of PCWA's energy costs in 2007. Figure 2-1 presents the breakdown of energy cost by energy type. The majority of PCWA's energy costs are electrical purchases from PG&E.

Overall PCWA energy use and cost increased from 2006 to 2007. Electricity use increased by 67%, and electricity costs increased by 87%. Natural gas use increased 24%, propane use decreased 50%, and diesel and gasoline use increased 11% from 2006 to 2007.

Table 2-1. Energy Use and Cost by Type

Energy Type	2006 use	2006 cost	2007 use	2007 cost
PG&E Electricity	5,092,389 kWh	\$ 624,695	8,562,182 kWh	\$ 1,171,669
Sierra Pacific Electricity	442,477 kWh	\$ 59,901	264,420 kWh	\$ 51,756
City of Roseville Electricity	1,727 kWh	\$ 302	1,834 kWh	\$ 320
Natural Gas	18,466 Therms	\$ 25,188	25,901 Therms	\$ 31,446
Propane	3,447 Gallons	\$ 8,447	1,626 Gallons	\$ 4,145
Diesel and Gasoline	114,997 Gallons	\$ 314,939	121,015 Gallons	\$ 351,026
Total Cost		\$ 1,033,471		\$ 1,610,362

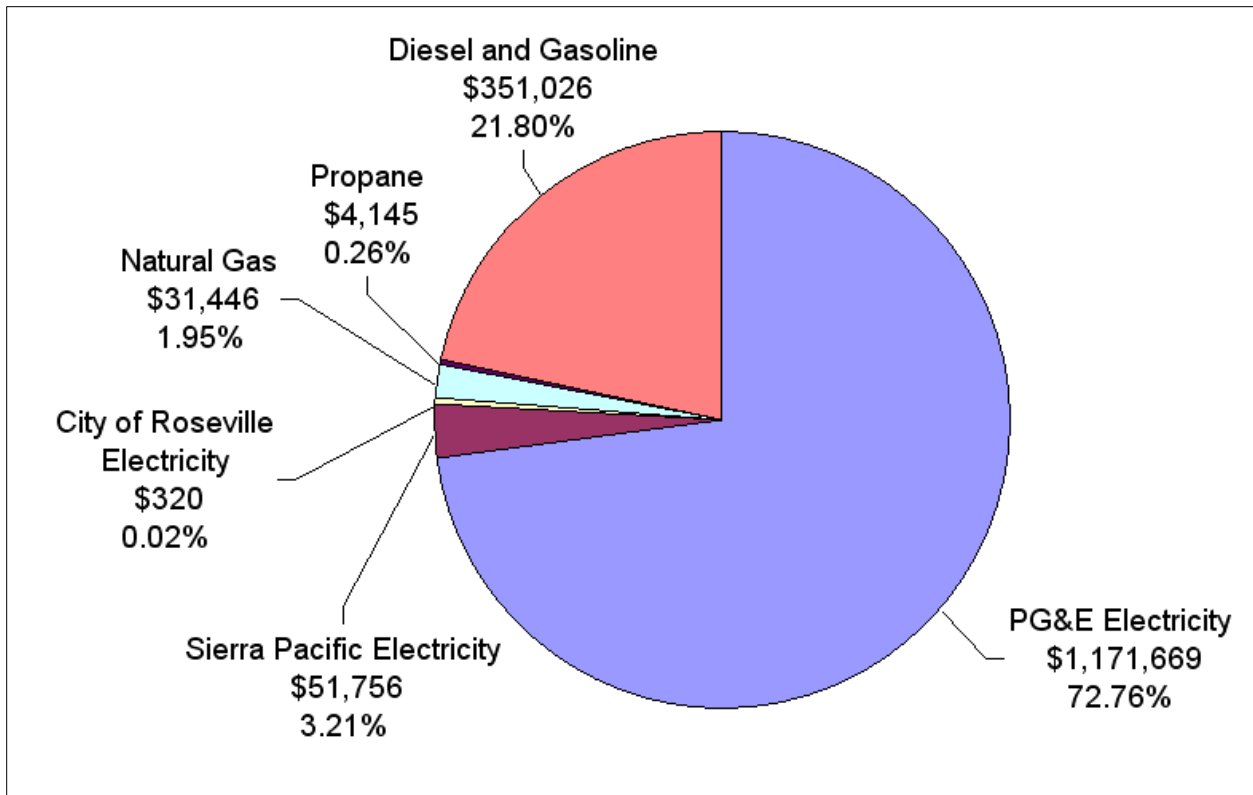


Figure 2-1. 2007 Energy Costs

2.1.2.1 Electricity Use

PCWA’s largest use of electricity is for pumping and water treatment. Electricity use by category for 2006 and 2007 is presented in Figures 2-2 and 2-3, respectively. PCWA used 5,509,985 kilowatt hours (kWh) in 2006, and 8,828,436 kWh in 2007. For the purposes of this study, the Sierra Pacific category is for the power used by Zone 4, the small groundwater system that supplies water near Truckee.

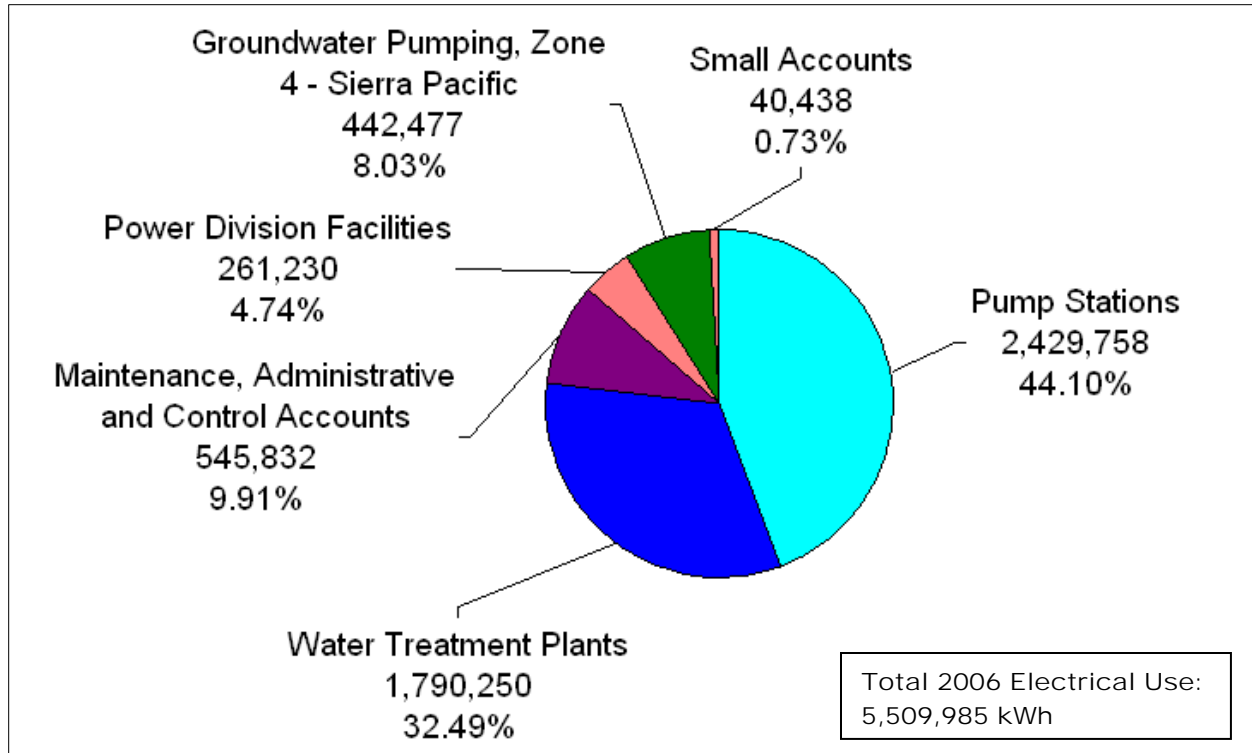


Figure 2-2. 2006 Electrical Use by Category (kWh)

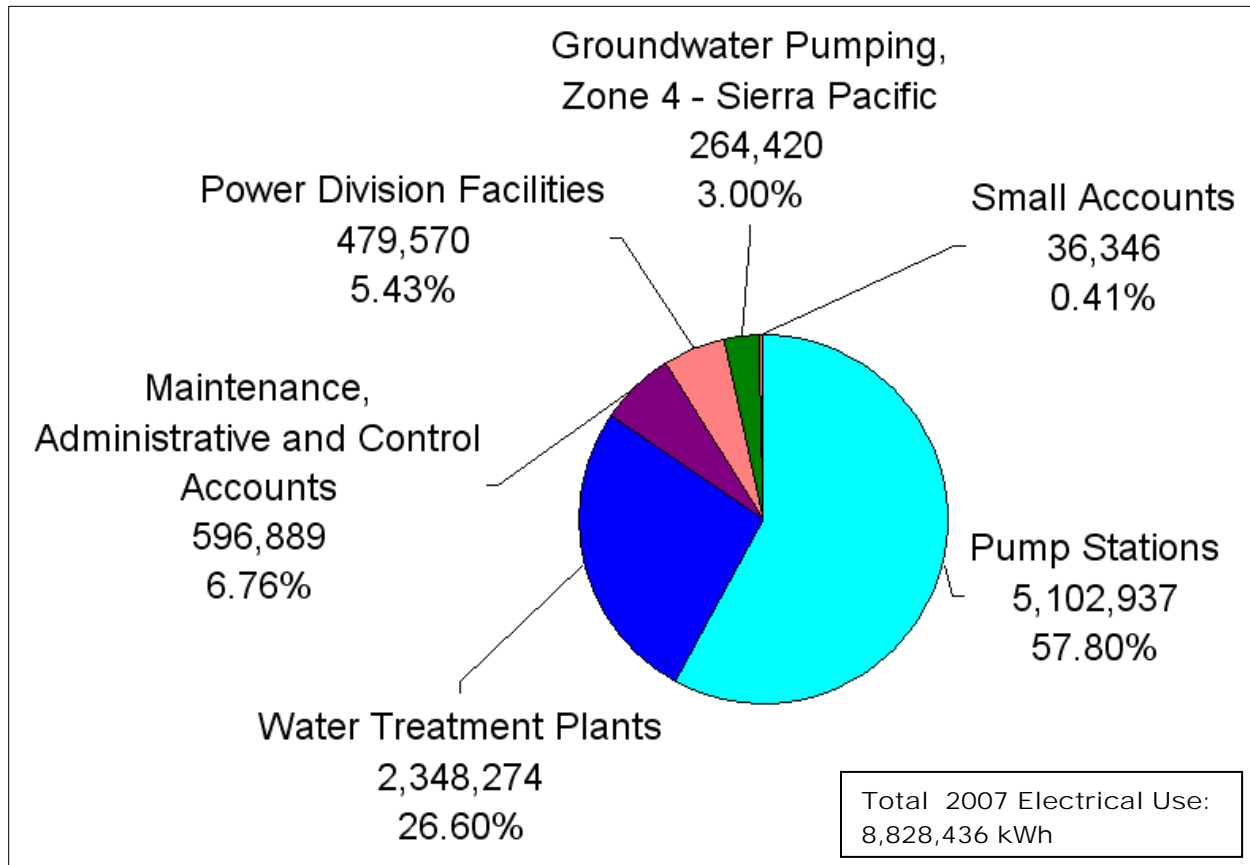


Figure 2-3. 2007 Electrical Use by Category (kWh)

PCWA's largest uses of electricity in 2006 and 2007 were the ATPS and the ARPS, as indicated in Figures 2-4 and 2-5. Both pump stations ran intermittently during 2006 and 2007 with an increase in electricity use in 2007. The ARPS electricity use increased 200% from 2006 to 2007, and the ATPS's electrical use increased by 77% from 2006 to 2007. Both of these pump stations were operated more frequently and pumped more water in 2007 compared to 2006.

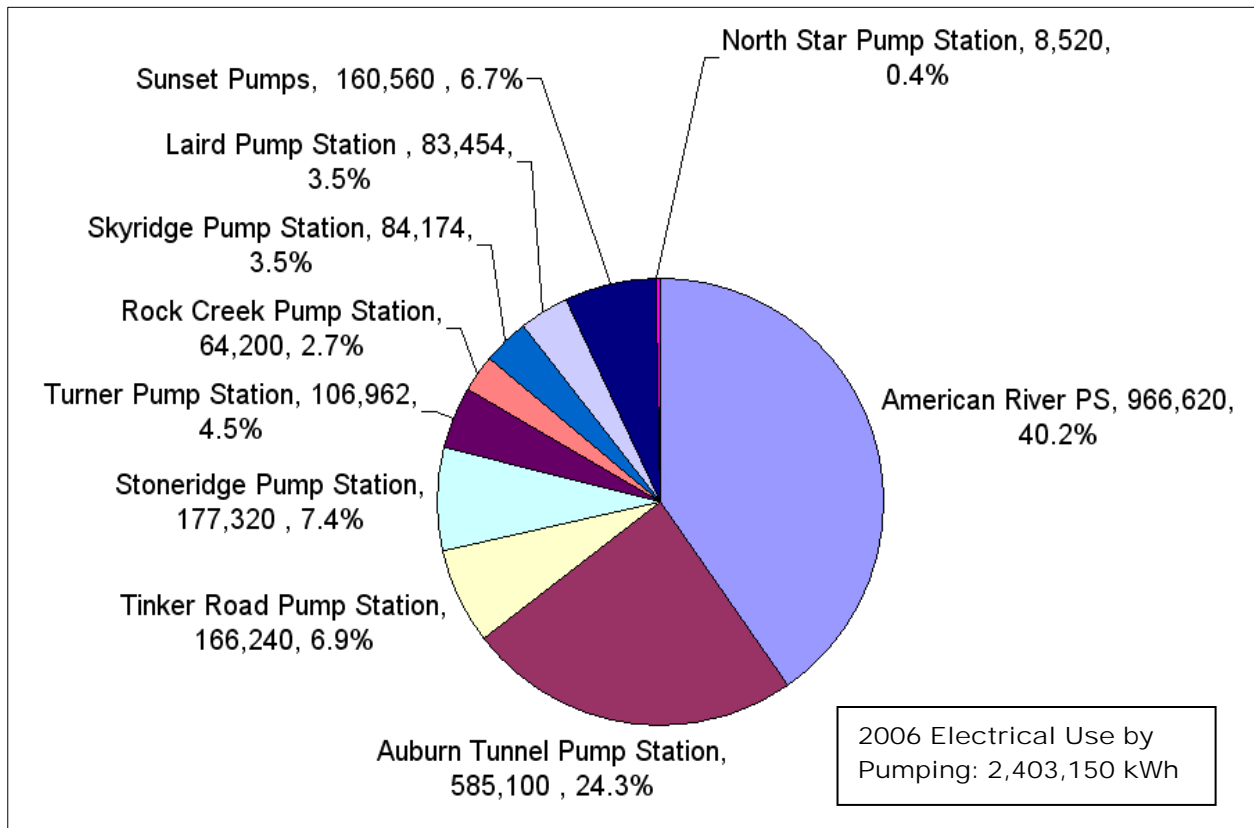


Figure 2-4. 2006 Electrical Use by Pumping Station (kWh)

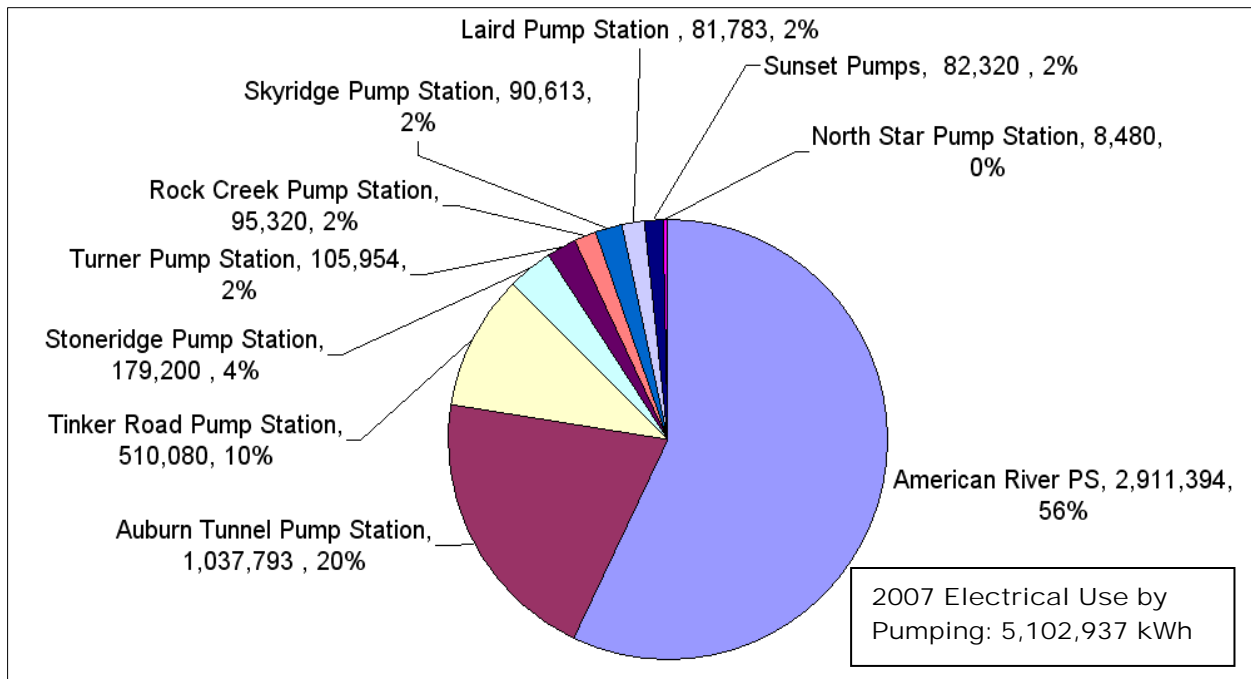


Figure 2-5. 2007 Electrical Use by Pumping Station (kWh)

PCWA WTPs used 2,348,274 kWh in 2007. The Foothill WTP accounted for 42% of electricity use by all WTPs in 2007. WTP electricity usage for 2006 and 2007 are presented in Figure 2-6 and 2-7. The WTP electricity use includes the power to operate treated water pumping facilities located at the treatment plants. Within the WTPs, pumping can account for up to 70 to 90 percent of energy use in water treatment processes (Elliot, 2003). The Foothill WTP is the largest PCWA WTP, with an overall capacity of 55 million gallons per day (mgd). For months with inaccurate electricity billing, the Foothill WTP electrical use was estimated by determining the ratio of kWh to acre-feet and applying that ratio.

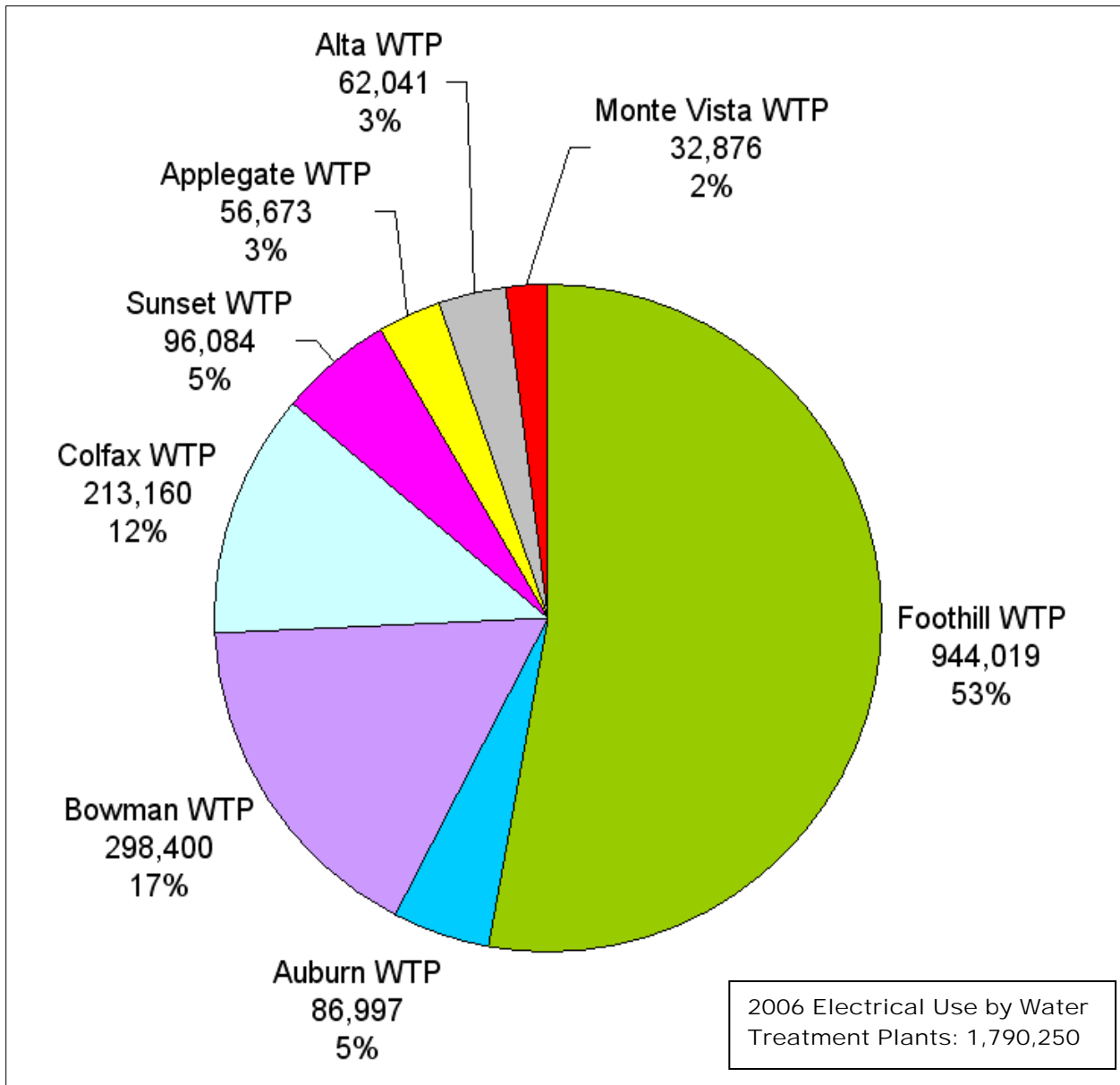


Figure 2-6. 2006 Electrical Use by Water Treatment Plants (kWh)

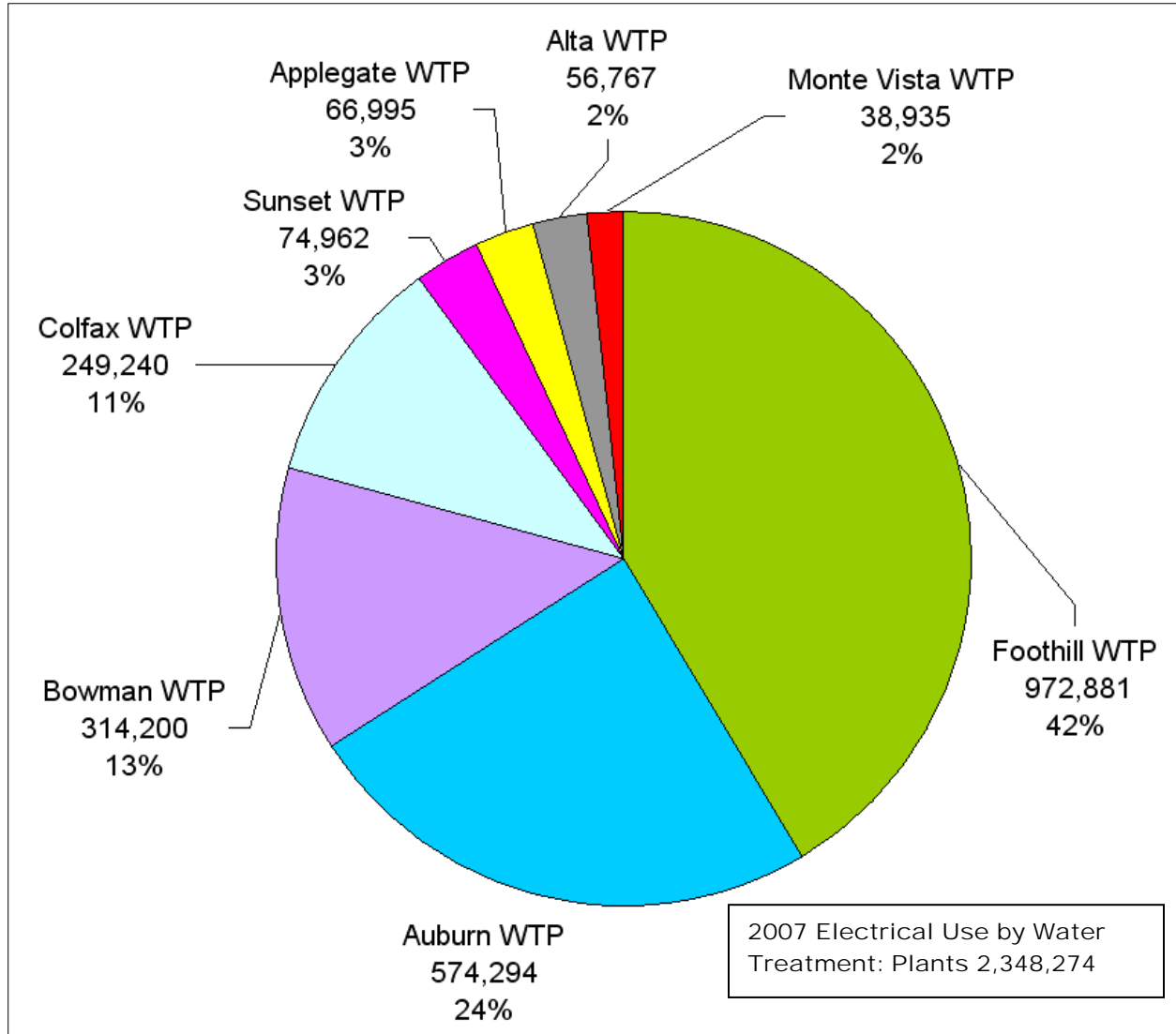


Figure 2-7. 2007 Electrical Use by Water Treatment Plants (kWh)

The Power Division’s electrical energy supplied by PG&E increased from 261,230 kWh in 2006, to 479,570 kWh in 2007, as shown in Figures 2-8 and 2-9. During periods when the hydroelectric facilities in the Power Division do not produce hydroelectric power, electrical power must be purchased from PG&E. The increased electrical supply from PG&E in 2007 was largely due to the extended power generation outage which occurred in 2007, which was longer than the 2006 outage, as presented in Table 2-2.

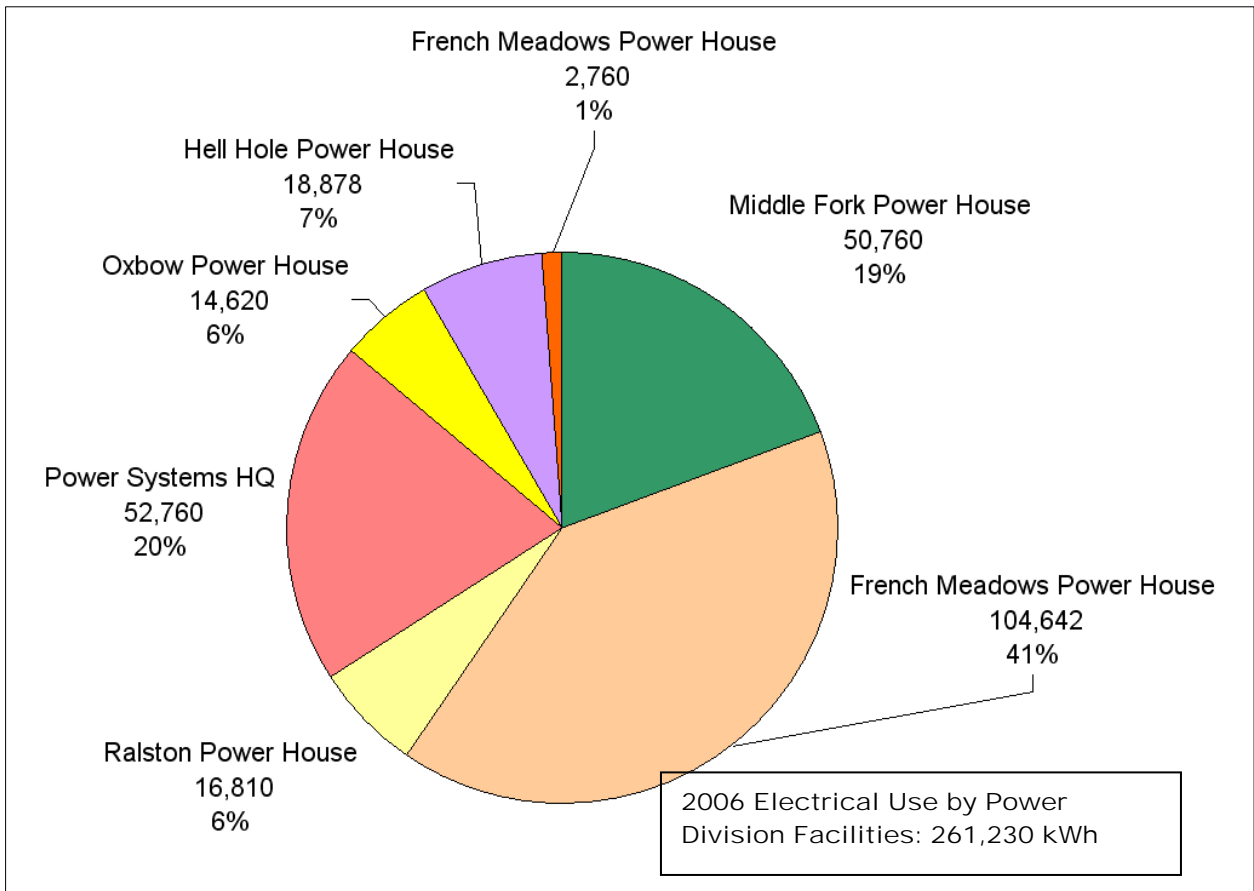


Figure 2-8. 2006 Electrical Use by Power Division Facilities (kWh)

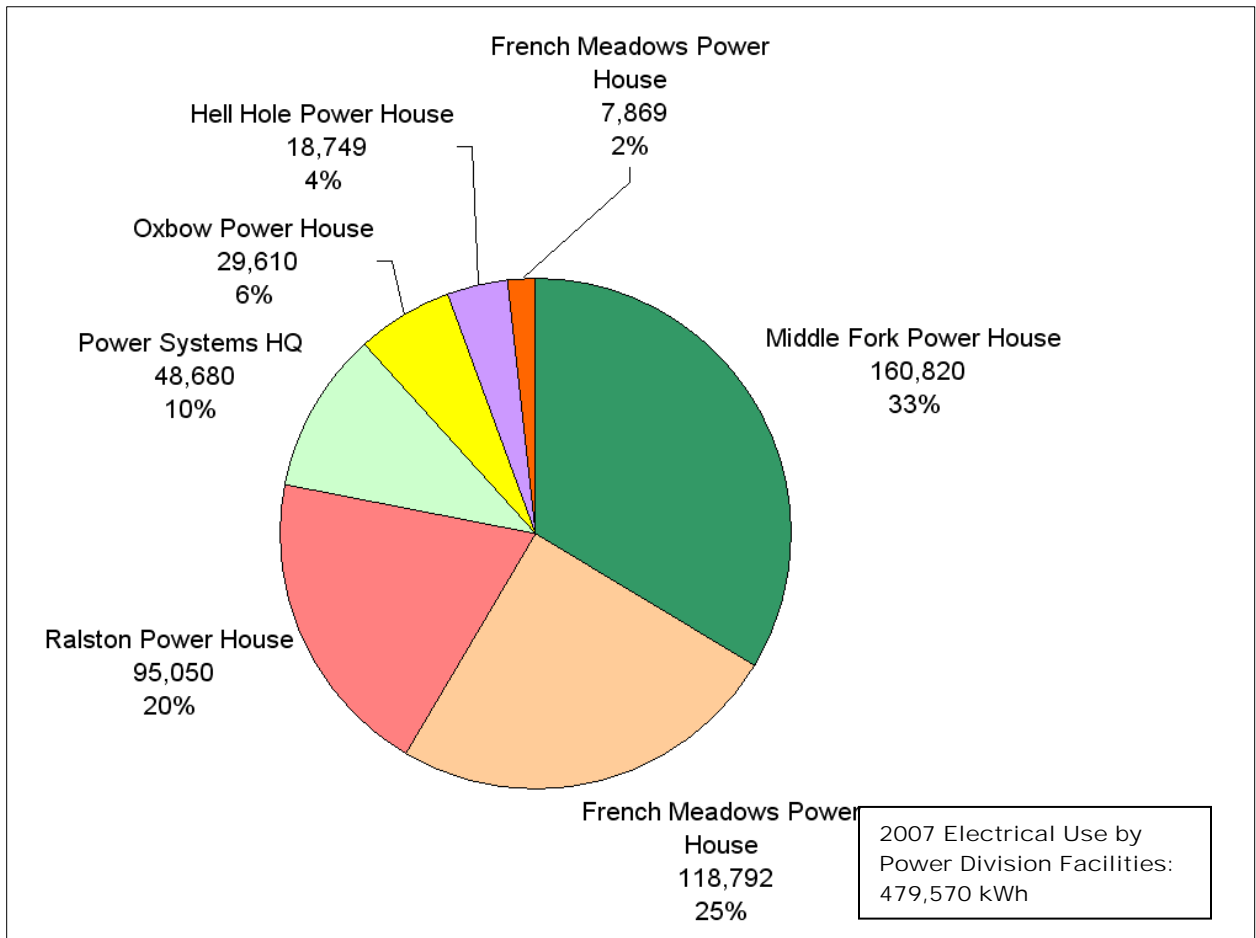


Figure 2-9. 2007 Electrical Use by Power Division Facilities (kWh)

Table 2-2. PCWA Power Generation Outage Days

Power Generation Facility	2006 Outage Days	2007 Outage Days
French Meadows	12	19
Middle Fork Units 1 and 2	25	94
Ralston	40	93
Oxbow	40	90
Hell Hole	2	30

Table 2-3 presents the electricity use, cost, and unit cost by account group. A detailed table with electricity use and cost by facility is presented in Appendix B. Total electrical bill cost includes use, taxes, and associated fees. As shown in Table 2-3, PCWA's average cost per kWh for 2007 was \$0.14. The unit cost per kWh varies across all of PCWA's electrical accounts. PG&E billing rate schedules are discussed in Section 2.3

Table 2-3. Electricity Use and Cost by Account Group

Category	2006 Electricity Use (kWh)	2006 Cost	2006 Average Cost per kWh	2007 Electricity Use (kWh)	2007 Cost	2007 Average Cost per kWh
Groundwater Pumping , Zone 4 - Sierra Pacific	442,477	\$59,901	\$0.14	264,420	\$51,756	\$0.20
Maintenance, Administrative, and Control Accounts ^a	545,832	\$79,069	\$0.14	596,889	\$99,056	\$0.17
Power Division	261,230	\$45,451	\$0.17	479,570	\$80,868	\$0.17
Pump Stations ^b	2,429,758	\$344,878	\$0.14	5,102,937	\$699,406	\$0.14
Water Treatment Plants ^c	1,790,250	\$144,957	\$0.08 ^d	2,348,274	\$282,247	\$0.12 ^d
Small Accounts	40,438	\$10,641	\$0.26	36,344	\$10,412	\$0.29
Total	5,509,985	\$684,897	\$0.12	8,828,434	\$1,223,745	\$0.14

^a Admin complex electricity use estimated for August-December 2007. This category includes field operations activities at the Maidu Maintenance center.

^b Stoneridge Pump Station electricity records partially unavailable. Electrical use was estimated.

^c The water treatment plant category contains data for facilities with incomplete records. Foothill WTP billing was incomplete. Auburn WTP 2007 electrical cost and electrical use was metered through three PG&E meters (84P365, 84P362 and 1P9886), which combined electrical use from the Sierra Center, communication tower, parking lights, gate access control, PCWA business complex, North Auburn Pump Station, and Auburn WTP. Portions of Auburn and Foothill WTPs' electricity use were estimated.

^d Average cost per kWh for WTPs may be low due to incomplete records for Foothill WTP.

Electricity use and volume of water pumped and treated are directly correlated. Electrical use by water agencies is typically expressed as kWh per ac-ft. Table 2-4 shows the size, amount of treated or pumped water, and the resulting kWh per ac-ft of treated water for PCWA's WTPs and large pump stations. The

largest amount of energy per ac-ft is used for pumping water, as noted in Table 2-4 for the ATPS and the ARPS. The operation of the WTPs uses less electricity per ac-ft in comparison to the pump stations.

Table 2-4. PCWA Water Division kWh/ac-ft

Selected Water Treatment Plants and Pump Stations	Rated Capacity (mgd)	2006 ac-ft treated	2007 ac-ft treated	2006 kWh/ac-ft	2007 kWh/ac-ft
Foothill WTP	55	29,589	31,226	32	31
Auburn WTP ^a	8	2,346	2,193	37	262 ^a
Sunset WTP	8	1,427	853	67	88
Bowman WTP	7	5,245	5,021	57	63
Colfax WTP	1.4	586	608	364	410
Monte Vista WTP	0.43	28	24	1,195	1,636
Alta WTP	0.11	152	151	408	375
Applegate WTP	0.07	25	25	2,272	2,639
Auburn Tunnel Pump Station	31	1,965	2,374	492	432
American River Pump Station *	30	3,591	7,892	163	376
Zone 1 Distribution Pump Stations	-	31,900	31,900	16	28

^a Auburn WTP electricity billing was combined in 2007 with other accounts, which increased the reported electrical use for 2007.

PCWA's electrical use and cost varies throughout the year as the quantity of water supplied to customers varies. The highest water use and electrical use is during the summer months. Electrical costs per kWh tend to be higher in the summer. As an example of this variation, electrical use and costs for the Skyridge pump station and the Colfax WTP are shown in Figures 2-10 and 2-11. Both facilities use more electricity during the summer months and less in the winter months and both pay a higher unit cost for electricity during the summer months. Monthly electrical use and costs for other facilities are presented in Appendix C.

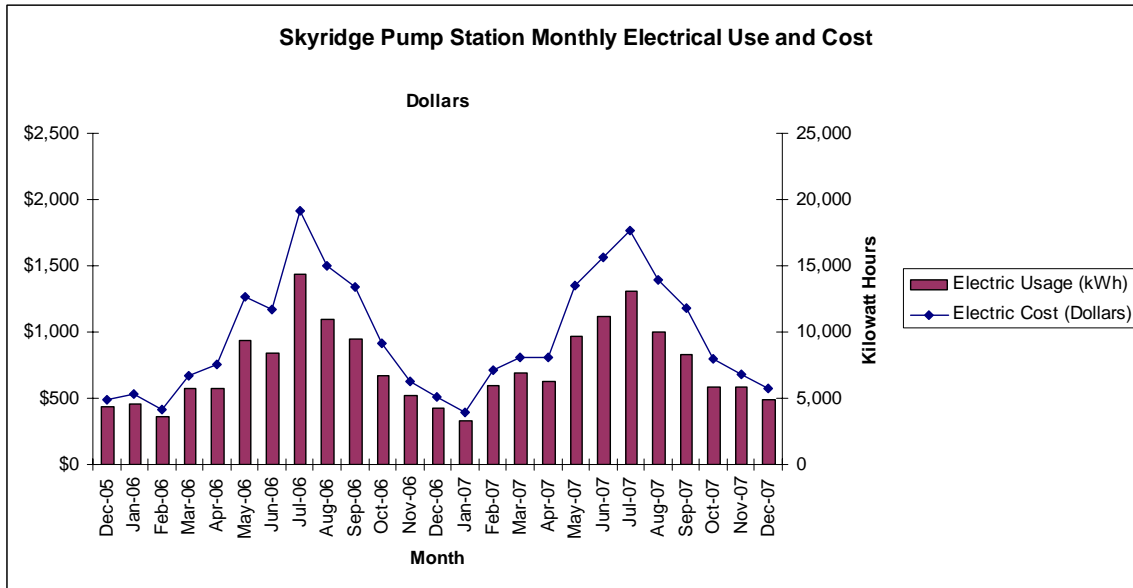


Figure 2-10. Skyridge Pump Station Monthly Electrical Use and Cost

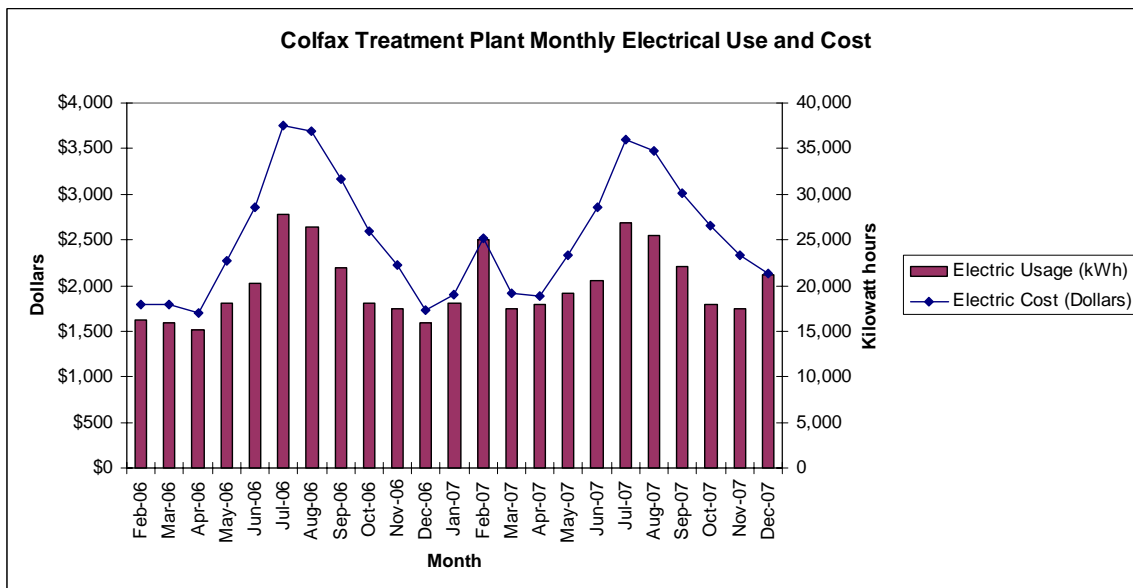


Figure 2-11. Colfax Water Treatment Plant Monthly Electrical Use and Cost

2.1.2.2 Fossil Fuel Use

Fossil fuel usage by PCWA represents approximately one quarter of all PCWA energy costs as shown in Figure 2-1. The majority of fossil fuel use is in the form of gasoline and diesel use. Table 2-5 shows PCWA gasoline and diesel fuel usage by equipment type for 2006 and 2007. On-road vehicle use accounted for 97% of 2007 PCWA gasoline usage and 86% of 2007 diesel usage. Off-road vehicle diesel use accounted for less than 1% of 2007 PCWA gasoline usage and 6% of 2007 PCWA diesel use. Emergency generators and portable equipment accounted for 3% and 6% of 2007 PCWA diesel use, respectively.

Table 2-5. Gasoline and Diesel Fuel Use by Equipment Type

Category	2006 Gasoline (Gallons)	2007 Gasoline (Gallons)	2006 Diesel (Gallons)	2007 Diesel (Gallons)
On-Road Vehicles	66,340	71,107	39,507	40,719
Off-Road Vehicles	147	189	2,767	2,906
Portable Equipment	779	2,178	3,026	2,700
Emergency Generators	0	0	2,431	1,217
Total	67,266	73,473	47,732	47,542

2.1.3 Power Generation

The PCWA Power Division consists of five hydroelectric dams: French Meadows, Middle Fork Units 1 and 2, Ralston, Oxbow, and Hell Hole. These hydroelectric dams produce electrical power which is sold to PG&E. Table 2-6 and Figure 2-12 shows 2006 and 2007 Power Division power generation and delivery. Power generation decreased by 70% from 2006 to 2007. This reduction was due to reduced precipitation in 2007, the Ralston wildfire, flooding, and an extended power generation outage period.

Table 2-6. PCWA Power Division 2006 & 2007 Power Generation and Delivery

Power Generation Facility	2006 Power Generation (kWh)	2006 Power Sold (kWh)	2007 Power Generation (kWh)	2007 Power Sold (kWh)
French Meadows	97,671,031	97,182,676	32,112,042	31,951,482
Middle Fork Units 1 and 2	846,594,383	842,361,412	255,360,417	254,083,615
Ralston	555,706,003	552,927,473	194,731,723	193,758,065
Oxbow	35,658,495	35,408,885	15,863,796	15,752,749
Hell Hole	4,986,450	4,836,857	4,596,900	4,458,993
Total	1,540,616,362	1,532,717,303	502,664,878	500,004,904

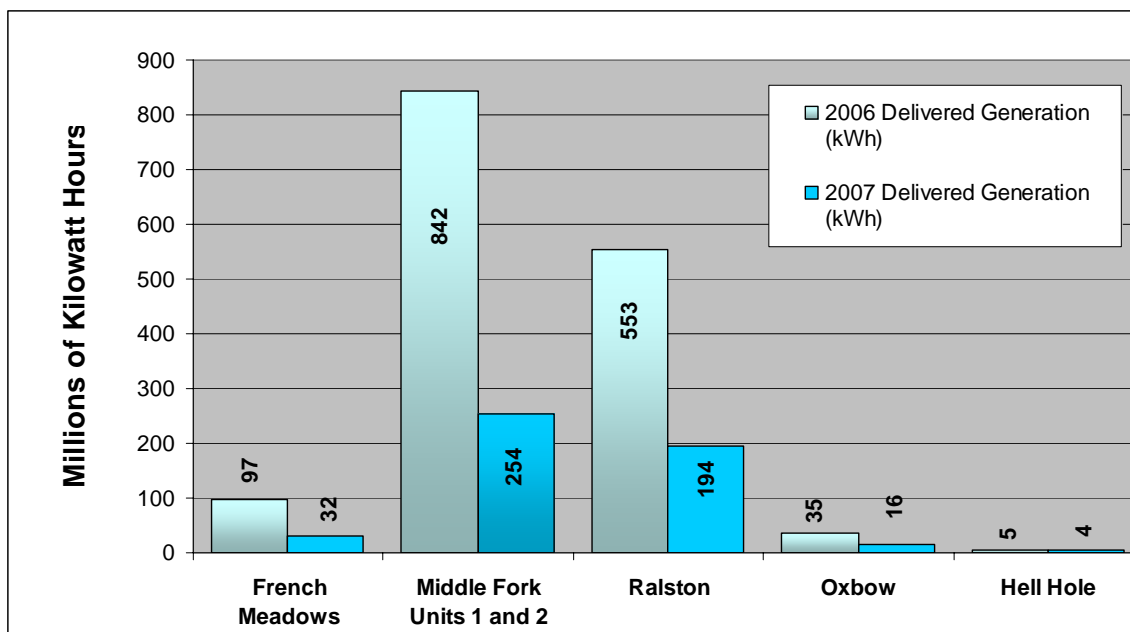


Figure 2-12. Delivered Electricity from PCWA Hydropower Facilities

2.1.4 Summary

PCWA's current energy supplies consist primarily of electricity, gasoline, and diesel fuels. Electricity use accounted for 76% and diesel and gasoline use accounted for 22% of PCWA's total energy costs of \$1.6 million in 2007. Electricity was predominately used by WTPs and pump stations. PCWA's average cost per kWh for 2007 was \$0.14. The unit cost per kWh varies across all of PCWA's electrical accounts. Electrical use and costs varies throughout the year to meet water deliveries, and is higher during summer periods. Ninety-two percent of gasoline and diesel fuel was used in on-road PCWA fleet vehicle operations.

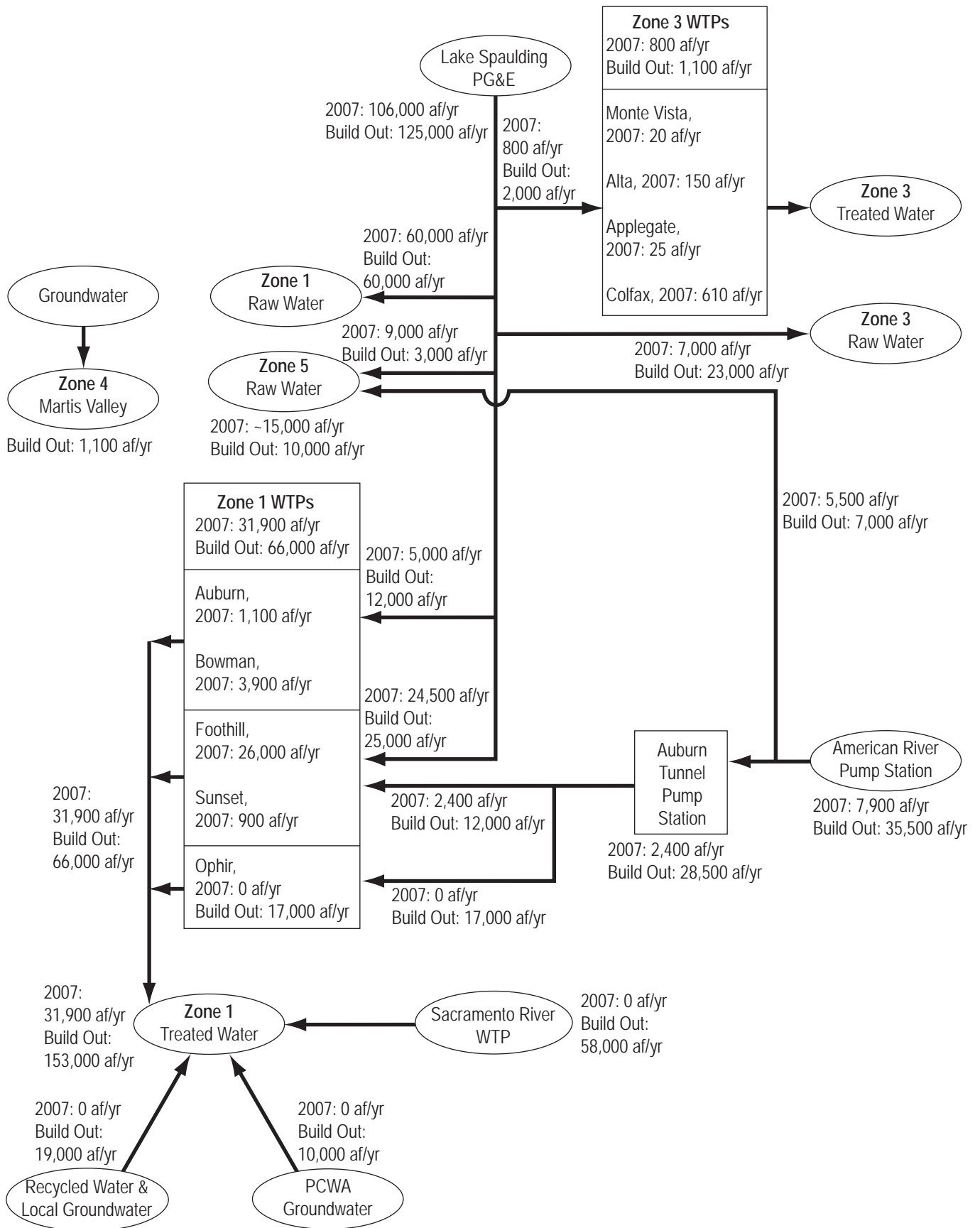
2.2 Future Energy Use

Future energy use through buildout of the PCWA service area is projected in this section. Future energy use is estimated by combining energy use factors and buildout water demand estimates.

2.2.1 Approach and Methodology

Buildout water demands for PCWA's service area were developed in the 2006 Integrated Water Resources Plan (Brown and Caldwell, 2006). These buildout water demands and the unit energy use by supply source allow for the estimate of buildout energy needs.

PCWA's principal surface water supply sources are the MFP, CVP, and PG&E. The PG&E water is supplied by gravity. The MFP and CVP supply sources must be pumped. Currently, the ARPS is the only location where the MFP and CVP water can be diverted. In the future, PCWA may choose to also add a diversion and treatment facility on the Sacramento River, which would also require pumping. The PG&E source provides most of the surface water supply in use today. At buildout, the PG&E supply will represent about half of the total supply. Figure 2-13 presents the water supply flow configuration for 2007 and buildout conditions.



	PROJECT 134903-008	SITE PCWA Energy Benchmark Study Placer County, California	Figure 2-13
	DATE 5-29-09	TITLE Current and Future Water Supply Configuration	

As noted in Section 2.1.2, most of PCWA's energy use is for the pumping and treatment of water. The most energy intensive water supply source is the water that is diverted and pumped by the ARPS and the ATPS, which are the MFP and CVP supplies. As shown in Table 2-4, the water pumped by both the ARPS and the ATPS requires approximately 800 kWh per ac-ft of supplied water. The PG&E water is supplied by gravity, so there is no energy needed for raw water pumping. The portion of the surface water supply that is used for treated water also requires energy for treatment and distribution pumping.

2.2.2 Results

Table 2-7 presents the estimate of future electrical energy use resulting from the buildout water demand projections. The estimate is first broken down by service zone, and then into treated and raw water. The 2007 energy use and supplied water quantity is presented, along with the resulting unit energy use per ac-ft of supplied water. The buildout energy use is estimated based on combining the buildout water supply projections with the unit energy use.

Some water supply and energy use observations resulting from the information in Table 2-7 can be made, as follows:

1. Water use will almost double by buildout from 2007 levels. Treated water use will grow by four times while raw water use will stay almost the same.
2. Total energy use will increase by approximately eight times. The majority of the increase in energy used will be for the pumping of MFP and CVP water from the American and Sacramento Rivers.
3. PCWA's current and future use of energy for the delivery and treatment of water per ac-ft is very low in comparison to the other water agencies in California. As shown in Table 2-7, the total energy use including for maintenance and the Power Division is approximately 78 kWh per ac-ft. At buildout the unit energy use overall will be approximately 300 kWh per ac-ft. While this unit use is large for PCWA, it is still a low value compared to the approximately 1,000 kWh per ac-ft seen in the Sacramento area, and the 3,000 and more kWh per ac-ft that is typical for southern California.

Table 2-7. Future Energy Use

Zone		2007			Build-Out	
		Energy use, kWh/yr	Water supply, ac-ft/yr	Unit energy use, kWh/ac-ft/yr	Water supply, ac-ft/yr	Energy use, kWh/yr
1	Treated Water					
	Raw Water Pumping					
	PG&E	0	29,500	0	37,000	0
	MFP and CVP-ARPS ^b	847,621 ^c	2,400	353	28,500	10,060,500
	MFP and CVP-ATPS	1,037,793	2,400	432	28,500	12,312,000
	WTPs	1,936,337	31,900	61	66,000	4,026,000
	CVP-Sacramento River WTP	0	0	500 ^c	58,000	29,000,000
	PCWA Groundwater	0	0	200 ^c	10,000	2,000,000

Table 2-7. Future Energy Use (continued)

Zone		2007			Build-Out	
		Energy use, kWh/yr	Water supply, ac-ft/yr	Unit energy use, kWh/ac-ft/yr	Water supply, ac-ft/yr	Energy use, kWh/yr
	Distribution Pumping	1,153,750	31,900 ^a	36	134,000 ^a	4,824,000
	Treated Water Subtotal	4,975,501	31,900	156	134,000	62,222,500
	PG&E-Raw Water	0	60,000	0	60,000	0
	Zone 1 Subtotal	4,975,537	91,900	54	194,000	62,222,500
3	PG&E-WTPs	411,937	800	515	2,000	1,030,000
	PG&E-Raw Water	0	7,000	0	23,000	0
	Zone 3 Subtotal	411,937	7,800	53	25,000	1,030,000
4	Sierra Pacific-Martis Valley			200(c)	1,100	220,000
5	Raw Water Pumping PG&E MFP-ARPS ^b	0 2,063,773	9,000 5,500	0 375	3,000 7,000	0 2,625,000
	Zone 5 Subtotal	2,063,773	14,500	142	10,000	2,625,000
Total Raw Water		2,063,773	81,500	25	81,000	2,625,000
Total Treated Water		5,387,438	32,700	165	136,200	63,473,500
Subtotal		7,451,211	114,200	65	217,200	66,098,500
Maintenance/Admin.		596,883				1,100,000
Power Division		838,869				850,000
Total		8,886,963	114,200	78	217,200	68,048,500

^a Not included in subtotal to avoid double counting.

^b ARPS total 2007 use 2,911,394 kWh for 7,900 ac-ft.

^c Assumed.

2.3 Electrical Utility Charges and Rate Schedules

PCWA purchases electricity from three electric utilities, PG&E, Sierra Pacific, and the City of Roseville. PCWA has a total of 121 separate electrical accounts that includes 3 Sierra Pacific and 2 Roseville accounts. Of the 116 PG&E accounts, there are 21 accounts that were not used nor billed in 2006 and 2007. Each utility has its own set of rate structures and billing mechanisms. Electrical use is reported in kilowatts per hour (kWh) and is generally billed based on electrical consumption and fees.

Over 95% of PCWA's electrical costs were billed under 15 PG&E rate schedules in 2007, as shown in Table 2-8. Two thirds of the electrical costs were billed under three rate schedules. Eight percent of total electrical cost was billed under rate "A1" and its variant "A1-P." Forty-seven percent of electrical cost was billed under rate "A6" and its variants, which included billing for the ATPS and the temporary ARPS. Twelve percent was billed under rate "E19-PX", the rate used for the permanent ARPS.

Table 2-8. Electric Rate Schedules and Use, 2007

Rate	Use	Cost	Cost/kWh	% of total Cost
A1	215,736	32,701	\$0.15	3%
A1-P	366,240	62,117	\$0.17	5%
A10-S	746,675	113,206	\$0.15	9%
A10-SX	179,200	40,298	\$0.22	3%
A6	2,788,409	386,442	\$0.14	32%
A6-X	510,080	63,337	\$0.12	5%
A6-W ^a	1,377,694	122,646	\$0.09	10%
AG-1B	36,777	6,094	\$0.17	0%
AG-5A	105,954	11,237	\$0.11	1%
ABS-TX	163,934	46,955	\$0.29	4%
E19-PX	1,217,545	147,698	\$0.12	12%
E19-SW	249,240	30,635	\$0.12	3%
NEMS	284,706	47,571	\$0.17	4%
STOUP	29,610	5,448	\$0.18	0%
STOUT	255,870	45,191	\$0.18	4%
Small PGE Accounts	34512	10412	\$0.30	1%
Sierra Pacific Accounts	264420	51756	\$0.20	4%
Roseville Accounts	1834	320	\$0.17	0%
Total	8,828,436	\$1,224,065	\$0.14	100%

^a Foothill WTP is included under the A6-W rate, and the cost per kWh rate is low because of incomplete records.

PG&E has 84 standard or published rates schedules and several customized rate schedules for certain large users, such as PCWA. A listing of the 84 general PG&E electric rate schedules is presented in Appendix D. The 15 rate schedules that encompass most of PCWA's electrical costs are summarized in Table 2-9. These rate schedules define the manner in which electrical use and cost are metered and billed by PG&E.

Electricity is typically billed through a quantity rate (dollars per kWh) demand charge, meter charge, and fees. The rate per kWh can vary by rate structure in amount and variability. Rates per kWh can vary seasonally and can vary by time of use during the day. Many rates, such as the "A-1" rate, utilize a seasonal rate, but do not use a time of use rate. Other rates, such as the "A-6" rate, utilize both a seasonal rate and a time of use rate. The demand charge is based on the maximum electrical demand.

Table 2-9. PG&E Rate Schedules for PCWA						
Rate Schedules	Title	Number of Accounts	Time of Use Rate	Seasonal Rate	Fee Structure	Account Name
A-1	Small (Basic) General Service	47	No	Summer (May 1 through October 31) Winter (November 1 through April 30)	Customer Charge (\$ per meter per day)	Multiple
A-1P	Small General Service P = Polyphase	20	No	Summer (May 1 through October 31) Winter (November 1 through April 30)	Customer Charge (\$ per meter per day)	Multiple
A10-S	Commercial General Service High Energy Use & Medium to High Load Factor S=Secondary Demand Charge	10	Yes	Summer (May 1 through October 31) Winter (November 1 through April 30)	Customer Charge (\$ per meter per day)	Multiple
A10-SX	Commercial General Service High Electrical Use & Medium to High Load Factor Discount during off-peak hours	1	Yes	Summer (May 1 through October 31) Winter (November 1 through April 30)	Customer Charge (\$ per meter per day) Demand Charge (\$ per kW of available demand per month)	Stoneridge Pump Station
A-6	Small General Time-of-Use Service Percent of energy used during off-peak hours	4	Summer Peak, Partial and Off-Peak Winter Peak and Off-Peak	Summer (May 1 through October 31) Winter (November 1 through April 30)	Customer Charge (\$ per meter per day)	Multiple
A6-X	Small General Service Time-of-Use Percent energy use during off-peak hours, with meter type X	1	Summer Peak, Partial and Off-Peak Winter Peak and Off-Peak	Summer (May 1 through October 31) Winter (November 1 through April 30)	Customer Charge (\$ per meter per day)	Tinker Road Pump Station
A6-W	Small General Service Time-of-Use Percent energy use during off-peak hours, with meter type W	6	Summer Peak, Partial and Off-Peak Winter Peak and Off-Peak	Summer (May 1 through October 31) Winter (November 1 through April 30)	Customer Charge (\$ per meter per day)	Multiple
AG-1B	Large Agricultural Flat Rate Energy Charge Based on kW demand	1	No	Summer (May 1 through October 31) Winter (November 1 through April 30)	Customer Charge (\$ per meter per day) Demand Charge (\$ per kW of available demand per month)	Laird Pump Station
AG-5A	Small Agricultural - High annual operational benefit Time-of-Use rate	1	Summer Peak, Part-Peak and Off-Peak Winter Part-Peak and Off-Peak	Summer (May 1 through October 31) Winter (November 1 through April 30)	TOU Meter Charge (\$ per meter per day) Customer Charge (\$ per meter per day) Demand Charge (\$ per kW of available demand per month)	Turner Pump Station
ABS-Tx	Solar Energy Metering	1	PG&E selects applicable rate schedule for application.	PG&E selects applicable rate schedule for application.	PG&E selects applicable rate schedule for application.	Auburn WTP
E19-PX	General Commercial Service Demand meter time-of-use service during peak hours X=Account between 500 to 1,000 kW	1	Summer Peak, Part-Peak and Off-Peak Winter Part-Peak and Off-Peak	Summer (May 1 through October 31) Winter (November 1 through April 30)	Customer Charge (\$ per meter per day) TOU Demand Charge Demand Charge (\$ per kW of available demand per month)	Permanent ARPS
E19-SW	General Commercial Service SW = Meter type	1	Summer Peak, Part-Peak and Off-Peak Winter Part-Peak and Off-Peak	Summer (May 1 through October 31) Winter (November 1 through April 30)	Customer Charge (\$ per meter per day) TOU Demand Charge Demand Charge (\$ per kW of available demand per month)	Colfax WTP

Table 2-9. PG&E Rate Schedules for PCWA (continued)						
Rate Schedules	Title	Number of Accounts	Time of Use Rate	Seasonal Rate	Fee Structure	Account Name
NEMS	Standard Net Energy Metering	1	PG&E selects applicable rate schedule for application.	PG&E selects applicable rate schedule for application.	PG&E selects applicable rate schedule for application.	PCWA Admin Complex
STOUP	Standby Time of Use Primary	1	Summer Peak, Part-Peak and Off-Peak Winter Peak, Part-Peak and Off-Peak	Summer (May 1 through October 31) Winter (November 1 through April 30)	Customer Charge (\$ per meter per day) Total Maximum Reactive Demand Charge (\$ per KVAR) Total Reservation Charge Demand Charge (\$ per kW of available demand per month)	Oxbow Power House
STOUT	Standby Time of Use Transmission	2	Summer Peak, Part-Peak and Off-Peak Winter Peak, Part-Peak and Off-Peak	Summer (May 1 through October 31) Winter (November 1 through April 30)	Customer Charge (\$ per meter per day) Total Maximum Reactive Demand Charge (\$ per KVAR) Total Reservation Charge Demand Charge (\$ per kW of available demand per month)	Ralston Power House, Middle Fork Power House

2.3.1 Discussion of Select Electric Rate Schedules

The following section describes the PG&E rate schedules which compromise over 67% of the electricity used for PCWA accounts and other select accounts that represent high and low rate accounts. Rate schedules described in this section include AG-5A, A6, A1, STOUP, and A10.

2.3.1.1 AG-5A Rate

The AG-5A rate is an account for large time-of-use agricultural power, and is described here because of the rate's low cost per kWh. Under the AG5A rate schedule an electrical account will qualify for this rate if 70% or more of the annual energy use on the meter is for agricultural end-uses. Agriculture end-uses consist of growing crops, raising livestock, pumping water for irrigation of crops, or other uses which involve production for sale. The Turner Pump Station is the only PCWA account billed under the AG5A rate, and it qualifies because it delivers water to agricultural uses.

The total cost for electricity under the AG-5A rate is determined from meter fees, kW demand fees, and electricity use. Meter and demand fees depend on sub-categories based on kW demand and motor types and are billed monthly. Electricity is charged on a per kWh basis in addition to the fees. Table 2-10 outlines AG5A time-of-use electrical rates.

Table 2-10. AG5A Time-of-Use Service Electrical Rates		
Energy Use	Energy Cost (\$/kWh)	Time Period of Energy Charges
Summer Services		May 1 through October 31
Peak Summer	\$0.20666	12:00 noon to 6 p.m. Monday through Friday (except holidays)
Partial Peak Summer	-. ^a	N/A ^b
Off-Peak Summer	\$0.10796	6p.m. through 12:00 noon - Monday through Friday All day - Saturday, Sunday and holidays
Winter Services		November 1 through April 30
Partial-Peak Winter	\$0.11324	8:30 a.m. to 9:30 p.m. Monday through Friday (except holidays)
Off-Peak Winter	\$0.09691	9:30 p.m. through 8:30 a.m. - Monday through Friday All day - Saturday, Sunday, holidays

^a Partial Peak Summer rate for AG5A does not exist.

^b Not applicable

Turner Pump Station's detailed bill summary is located in Appendix A. The detailed bill shows that Turner Pump Station consumes more electrical energy in the off-peak summer and winter hours than during the peak summer and winter hours. This pattern of utilizing off-peak electrical use utilizes the lowest energy cost under the A6 rate schedule.

2.3.1.2 A6, A6-W, and A6-X Rates

This rate is described here because a large portion of PCWA electricity use is billed under this rate. The A6 rate is a time-of-use rate schedule that is not available for residential or agricultural service for which a residential or agricultural schedule is applicable. Customers with a maximum demand of 200kW or greater for three consecutive months must have interval data meters that can be read remotely by PG&E. There are two sub-groups of rate A6, which are rate A6-W and rate A6-X. PCWA is billed under all three rates based on whether or not a time-of-use meter was installed and charged prior to May 1, 2006.

PCWA was billed under A6, A6-W, and A6-X in 2007 at the following facilities:

- Temporary American River Pump Station
- Auburn Tunnel Pump Station
- Alta WTP
- Foothill WTP
- Bowman WTP
- Skyridge Pump Station
- Tinker Road Pump Station

The total cost for electricity under A6, A6-W, and A6-X rates is determined from meter fees and electricity use. Meter fees vary by account sub-type, with A6, A6-W, and A6-X each having different daily meter fees. Electricity is charged on a per kWh basis in addition to the fees. Table 2-11 outlines A6, A6-W, and A6-X time-of-use electrical rates, which are the same for each sub-rate. Monthly electric bill summaries are located in Appendix A.

Table 2-11. A6, A6-W and A6-X Time-of-Use Service Electrical Rates

Energy Use	Energy Cost (\$/kWh)	Time Period of Energy Charges
Summer Services		May 1 through October 31
Peak Summer	\$0.37008	12:00 noon to 6 p.m. Monday through Friday (except holidays)
Partial Peak Summer	\$0.17321	8:30 a.m. to 12:00 noon and 6:00 p.m. to 9:30 p.m. Monday Through Friday (except holidays)
Off-Peak Summer	\$0.11087	Monday through Friday Saturday, Sunday and holidays, except for 8:30 a.m. to 9:30 p.m.
Winter Services		8:30 a.m. to 12:00 noon and 6:00 p.m. to 9:30 p.m. November 1 through April 30
Partial-Peak Winter	\$0.13349	Monday through Friday (except holidays)
Off-Peak Winter	\$0.11015	Monday through Friday (except holidays) Saturday, Sunday, and holidays

2.3.1.3 A1 and A1-P Rates

PCWA has 47 accounts that are billed under the A1 rate. The A1 rate is used for small general service and is not available to residential or agricultural service for which a residential or agricultural schedule is applicable. The A1 rate is limited to accounts with a maximum demand of 200kW or less. The A1 electrical rate schedule has a flat rate schedule for summer and winter months.

The total cost for electricity under the A1 and A1-P rates is determined from meter fees and electricity use. Meter fees vary by account sub-type, with A1 and A1-P each having different daily meter fees. Electricity is charged on a per kWh basis in addition to the fees. Table 2-12 outlines the A1 and A1-P flat rate electrical rates, which are both the same.

Table 2-12. A1 Electrical Rates

Energy Use	Energy Cost (\$/kWh)	Time Period of Energy Charges
Summer Services		May 1 through October 31
Summer Flat Rate	\$0.18376	All Day, Every Day
Winter Services		November 1 through April 30
Winter Flat Rate	\$0.13024	All Day, Every Day

2.3.1.4 STOUT, and STOUP Rates

STOUT and STOUP rates are used at three power division facilities, Oxbow Power House, Middle Fork Power House, and Ralston Power House. These facilities purchase power from PG&E during periods when the hydroelectric facilities are not generating power, and are described here because of a high total cost for electricity purchases under these rates.

The total cost for electricity under the STOUT and STOUP rates is determined from meter fees, kW demand fees, and electrical use. Meter and demand fees depend on sub-categories based on kW demand and motor types and are billed monthly. Electricity is charged on a per kWh basis in addition to the fees. Table 2-13 outlines STOUT and STOUP time-of-use electrical rates.

Table 2-13. STOUP and STOUT Time-of-Use Service Electrical Rates

Energy Use	STOUP Energy Cost (\$/kWh)	STOUT Energy Cost (\$/kWh)	Time Period of Energy Charges (Times apply to both STOUP and STOUT)
Summer Services			May 1 through October 31
Peak Summer	\$0.26206	\$0.10286	12:00 noon to 6:00p.m. Monday through Friday (except holidays)
Part-Peak Summer	\$0.16196	\$0.08857	8:30a.m. to 12:00 noon and 6:00p.m. to 9:30p.m. Monday through Friday (except holidays)
Off-Peak Summer	\$0.12343	\$0.08341	9:30p.m to 8:30a.m. Monday through Friday All day Saturday, Sunday, and Holidays
Winter Services			November 1 through April 30
Part-Peak Winter	\$0.14262	\$0.08341	Monday through Friday (except holidays)
Off-Peak Winter	\$0.12098	\$0.07751	Monday through Friday (except holidays) All day Saturday, Sunday and holidays

2.3.1.5 A10S Rate

The A10 is a demand metered rate schedule for general service customers, and is described here because a significant portion of PCWA electricity use is billed under this rate. It is not available for residential or agricultural service for which a residential or agricultural schedule is applicable. Under A-10, electricity demand may not exceed 499 kW for three consecutive months or the account will be transferred to another rate schedule. A sub schedule of rate A10 is schedule S, which is for customers whose premises are regularly supplied in part by electric energy from a non-utility source of supply. All PCWA accounts that are under the A10 rate are under schedule S, which is named A10-S.

The total cost for electricity under the A10-S rate is determined from meter fees, kW demand fees, and electricity use. Meter and demand fees depend on sub-categories based on kW demand and voltage requirements and are billed monthly. Electricity is charged on a per kWh basis in addition to the fees. Cost per kWh is variable based on voltage, transmission, transmission rate, adjustments, and reliability service charges.

PCWA was billed under A10-S in 2007 at the following facilities:

- Auburn WTP
- Maidu Maintenance Complex
- Sunset Pump Station
- Applegate WTP
- Stoneridge Pump Station

2.3.1.6 E19-PX Rate

PCWA is billed for electricity under the E19-PX rate at the Permanent ARPS. The ARPS is required by PG&E to be billed under the E19 rate schedule because it has a maximum power demand that exceeds 499 kW, and the account receives the PX designation by the timing of account setup.

The total cost for electricity under the E19 rate is determined from meter fees, kW demand fees, and electricity use. There are three demand charge categories under the E19 rate, dependant on voltage requirements, a maximum peak period demand charge, a maximum part peak period charge, and a maximum demand charge. The bill for the E19 rate includes all three charges. Meter fees are dependant on the voltage required and are billed on a per day basis. The electric use is billed on a per kWh basis that is dependant on the voltage required.

2.3.2 Sierra Pacific and City of Roseville

PCWA has three electrical accounts with Sierra Pacific, which are billed on under rate schedules A-1 and A-2, as identified in Table 2-14. Sierra Pacific supplies electricity to customers in portions of Nevada and California, and has 20 rate schedules for California consumers. Electrical rate schedules provided by Sierra Pacific can be viewed in Appendix D. The general service rate schedule is defined as an account that demands less then 20 kW for any three months of the last twelve months. The medium general service rate schedule is defined as an accounts demand that is between 50 kW and 200 kW for any three months of the last twelve months.

Table 2-14. PCWA SP Accounts and Rate Schedules

Rate Schedules	Rate Code	Rate Schedule Title	Sierra Pacific Accounts
A-1	E50	General Service	Pump Station
A-1	E52	Medium General Service	Groundwater Well

City of Roseville Electric Utility provides electrical power to two telemetry stations for PCWA at 232 Sagemoor Court and 7098 Claremont Circle in Roseville, CA. The telemetry units are used for water metering stations. The rate schedule of these COR accounts are classified as GS-1 small general services, which coincides with each account's small power use.

2.3.3 Western Area Power Authority

PCWA purchased electricity from Western Area Power Authority (WAPA) for the temporary ARPS, ATPS, and Foothill WTP facilities. PCWA obtains WAPA power through the WAPA transmission service. WAPA transmits electrical power to PG&E substations where the incoming WAPA electrical power is metered. Electric power from the substation is sent over PG&E's distribution network to the end user. This process is called wheeling, and thus, PG&E wheels the WAPA power from its substations to PCWA facilities.

WAPA electricity costs for the temporary ARPS, ATPS, and Foothill WTP are rolled into PG&E bills for those facilities. PG&E bills include PG&E's wheeling charge and the lump sum from WAPA for the electricity.

2.3.4 Electric Utility Bill Summary

This study examined the rate schedules that were used for the billing of electricity to PCWA's largest electricity using accounts. Over 60% of PCWA's electrical costs are billed under 4 rates (A6, A1, E19-PX, and A10-S). The majority of PCWA electrical costs are billed under 11 rate schedules, many of which serve one account. Due to the complexity of the multiple rate schedules and electrical use for PCWA facilities, a detailed analysis of current rate schedules and power usage for each facility is needed to determine if the most optimal schedule is being used at each site. To prioritize this analysis, additional investigation should first be performed for facilities that are billed under the A6, E19-SW, A10-S rate schedules

Due to the large quantity of power used by PCWA, it may be possible to realize significant savings in electricity costs by reducing electricity use by a relatively small percentage. Additionally, it is possible that a new rate schedule could be negotiated with PG&E for a specific electric account. Renegotiation of the rate schedules would have the most value for PCWA's largest electrical use accounts, specifically the ATPS and ARPS.

3. GREENHOUSE GAS FOOTPRINT

This section provides background information on greenhouse gas emissions, describes inventory boundaries, identifies the inventory approach and methodology, and provides a GHG inventory for 2006 and 2007.

3.1 Greenhouse Gas Emissions Inventory Background

Under Assembly Bill 32 (AB 32), GHG emissions became a regulated emission to be regulated by the California State Air Resources Board (CARB). AB 32 requires CARB to adopt regulations that require the reporting and verification of statewide GHG emissions. AB 32 further requires that statewide emissions be limited and reduced to a similar level of emissions to those emitted in 1990. The reduction of statewide GHG emissions is required by AB 32 to be reduced to 1990 levels by 2020. The bill requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions.

Under AB 32's direction, CARB began to implement guidelines and requirements that would begin compliance with the reduction of GHG emissions by 2020. In June 2007, CARB published a list of early action items for use in reducing GHG emissions. CARB also designated requirements for select industries, such as power generation and cement manufacturing, to quantify their emissions in 2008 and report them to CARB in 2009. Industries not required to report GHG gases under this requirement were encouraged to voluntarily report their GHG emissions to the California Climate Action Registry (CCAR). Water agencies such as PCWA are not required but are encouraged to report GHG emissions to CCAR.

The CCAR was established by California statute as a non-profit voluntary registry for GHG emissions. The purpose of CCAR is to help companies and organizations with operations in the state to establish GHG emissions baselines against which any future GHG emission reduction requirements may be applied.

CCAR encourages voluntary actions to increase energy efficiency and decrease GHG emissions. Using any year from 1990 forward as a base year, participants can record their GHG emissions inventory. The State of California, in turn, will offer its best efforts to ensure that participants receive appropriate consideration for early actions in the event of any future state, federal, or international GHG regulatory scheme. Registry participants include businesses, non-profit organizations, municipalities, state agencies, and other entities.

CCAR has developed a General Protocol and additional industry-specific protocols which give guidance on how to inventory GHG emissions for participation in CCAR: what to measure, how to measure, the back-up data required, and certification requirements. The Registry requires the inclusion of all direct GHG emissions, along with indirect GHG emissions from electricity use. CCAR appropriate GHG inventories follow five principles that serve as the basis of reporting and verifying emissions with CCAR:

- **Relevance:** Relevant GHG inventories reflect the GHG emissions of the entity and include emissions information produced by following the appropriate entity boundaries.
- **Completeness:** Complete GHG inventories include emissions from all GHG sources and activities within the specified scope of the participant's report. Baseline and annual emissions results include all GHG emission sources.

- **Consistency:** Consistently developed GHG inventories enable meaningful comparison of emissions performance over time and across similar organizations.
- **Accuracy:** Accurate GHG inventories must be within the materiality threshold of 5% of the verifier's estimate of total emissions. The verification process validates the accounting and reporting decisions made by the participant and ensures that the GHG emissions reports are precise and credible.
- **Transparency:** Reporters must make available to their verifiers the necessary information and documentation used to produce the inventory.

There are two types of GHG inventories, uncertified and certified. Uncertified inventories have not been through the verification process, and certified inventories have been verified by a third party reviewer as accurate. The CCAR requires verification for membership, however, member agencies are not required to submit verification for the first two years of participation. This flexibility is intended to allow agencies to have time to fully understand the calculating, reporting, and verification processes.

The baseline year of GHG emissions is used as the datum or reference point against which to measure GHG emissions increases and decreases over time. Member agencies select their baseline according to the year that best represents their standard emissions profile. The baseline is adjusted over time to reflect structural changes in the agency. The baseline year can be any year after 1990. After establishing a baseline, participants should report verified emissions each following year. There are several factors to consider when selecting a baseline:

- **Data Certainty:** There should be sufficient data to verify emissions against the requirements in the General Reporting Protocol for the baseline year.
- **Comparable Organizational Structure:** The agency's organization during the baseline year should be sufficiently comparable to its current organization to allow a meaningful comparison of current emissions with those of the baseline year.
- **Relative Emission Levels:** The baseline year should be selected to report maximized or minimized emissions relative to recent emissions based on which emission level provides the most benefit to the agency.

3.2 Boundaries

To establish an accurate GHG inventory, the member agency should identify the geographic and organizational boundaries that the inventory will be conducted under. Geographic boundaries are primarily intended for agencies that operate in multiple states and/or countries. Since PCWA entirely exists within California, the geographic boundary is defined as the entirety of PCWA's operations area. To establish an organizational boundary, member agencies should evaluate all operations, facilities, and sources that are within the selected geographic boundary. There are two options for determining the GHG emissions based on management control or ownership control. Ownership control reports a percentage of emissions based on percent ownership of a facility or company. Management control reports 100% of emissions from operations, facilities, and sources that the agency controls. Because PCWA wholly owns and manages all operations, facilities, and sources, its organizational boundary will include 100% of emissions from all of its operations, facilities, and sources.

3.3 Approach and Methodology

The approach and methodology used in this inventory is consistent with the approach identified in *California Climate Action Registry General Reporting Protocol Version 3.0 April 2008* (general reporting protocol). Emissions are inventoried in three categories, indirect, direct, and de minimis.

Indirect emissions are emissions that occur because of the member agency's actions, but are produced by sources owned or controlled by another entity. Indirect emissions generally occur from electricity, steam, and heat purchases, however most indirect emissions occur from electricity purchases. Direct emissions are emissions that are from sources that are owned or operated by the member agency. Direct emissions include: mobile combustion sources, stationary combustion sources, process emissions, and fugitive sources, such as tetrafluoroethane. De minimis emissions are a quantity of GHG emissions from any combination of sources which, when summed equal less than 5% of the member agency's total emissions. The de minimis category of emissions is intended to ease the burden of reporting when a large number of very small emissions are present.

3.3.1 Methodology by Emissions Source

The methodology used to calculate GHG emissions varied by source. There were six primary types of sources evaluated in the GHG inventory. In general, direct emissions are calculated by identifying fuel use, and applying an emission factor from the general reporting protocol to calculate the carbon dioxide (CO₂), methane, and nitrous oxide emissions. Methane and nitrous oxide emissions are then converted into carbon dioxide equivalent (CO₂e), and summed to total GHG emissions. The source type and methodology are identified below.

Small Gasoline Powered Equipment

Direct CO₂ emissions from small gasoline powered equipment were calculated using the following steps:

1. Identification of total annual fuel consumption
2. Selection of the appropriate CO₂ emission factor from the general reporting protocol
3. Multiplication of fuel consumed by the emission factor to calculate total CO₂ emissions.

Direct methane and nitrous oxide emissions from gasoline powered equipment were calculated using the following steps:

1. Identification of total annual fuel consumption
2. Selection of appropriate emission factors from the general reporting protocol
3. Calculation of methane and nitrous oxide emissions for each piece of equipment
4. Conversion of methane and nitrous oxide emissions to CO₂e.

Diesel Equipment and Emergency Generators

Direct CO₂ emissions from diesel equipment were calculated using the following steps:

1. Identification of total annual fuel consumption
2. Selection of the appropriate CO₂ emission factor from the general reporting protocol
3. Multiplication of fuel consumed by the emission factor to calculate total CO₂ emissions.

Direct methane and nitrous oxide emissions from diesel equipment were not calculated, because emissions factors were not available in the general reporting protocol. Methane and nitrous oxide emissions from diesel equipment are identified as de minimis in this inventory.

Vehicles

Direct CO₂ emissions from mobile combustion sources were calculated using the following steps:

1. Identification of total annual fuel consumption by fuel type and vehicle type
2. Selection of the appropriate CO₂ emission factor from the general reporting protocol
3. Multiplication of fuel consumed by the emission factor to calculate total CO₂ emissions.

Direct methane and nitrous oxide emissions from mobile sources were calculated using the following steps:

1. Identification of the vehicle types, fuel, and model years of all vehicles.
2. Identification of annual mileage by vehicle type
3. Selection of appropriate emission factors from the general reporting protocol
4. Calculation of methane and nitrous oxide emissions for each vehicle
5. Conversion of methane and nitrous oxide emissions to CO₂e.

Electricity Use

To calculate indirect emissions from electricity use, the following steps were used: determination of annual electricity use in the inventory area, acquisition of the appropriate electricity emission factor that apply to the electricity source used from PG&E (0.45581 pounds CO₂e per kWh), and determination of the annual emissions in metric tons.

Propane and Natural Gas

Direct CO₂ emissions from propane and natural gas use were calculated using the following steps:

1. Identification of total annual propane and natural gas use
2. Selection of the appropriate CO₂ emission factor from the general reporting protocol
3. Multiplication of fuel consumed by the emission factor to calculate total CO₂ emissions.

Direct methane and nitrous oxide emissions from propane and natural gas use were calculated using the following steps:

1. Identification of the total annual propane and natural gas use
2. Selection of appropriate emission factors from the general reporting protocol
3. Calculation of methane and nitrous oxide emissions for propane and natural gas use
4. Conversion of methane and nitrous oxide emissions to CO₂e.

Fugitive Tetrafluoroethane Releases from Air Conditioning Maintenance

Direct CO₂ emissions from fugitive tetrafluoroethane emissions were calculated using the following steps:

1. Identification of total fugitive tetrafluoroethane emissions
2. Conversion of methane and nitrous oxide emissions to CO₂e.

Direct methane and nitrous oxide emissions are not applicable to fugitive tetrafluoroethane emissions because tetrafluoroethane is not burned, and therefore does not convert into other gases.

Reservoir Emissions

Reservoir GHG emissions from decaying organic matter are not reported under CCAR protocols. In general, shallow reservoirs in tropical climates have more GHG emissions than deeper reservoirs in boreal climates, where reservoir emissions are low (World Commission on Dams, 2000). Reservoir emissions were studied

through a sampling program in *The Issue of Greenhouse Gases from hydroelectric Reservoirs: From Boreal to Tropical Regions* (Tremblay et al 2007). Tremblay concludes that “In reservoirs older than 10 years in boreal and semi-arid regions, GHG emissions are similar than those of natural lakes.”

3.4 2006 and 2007 Greenhouse Gas Emissions Inventory Results

The GHG inventory indicates that 2,207 metric tons of CO₂e were emitted in 2006, and 3,053 metric tons of CO₂e were emitted in 2007. An 846 metric ton increase of emissions took place from 2006 to 2007. Appendix E provides detailed GHG emissions calculations, and Table 3-1 provides a summary of emissions. The largest change in emissions from 2006 to 2007 is accounted for by an increase in electricity use, a 767 metric ton increase. Electricity use increased in 2007 because of increased raw water pumping through the ARPS and the ATPS.

Emission Source Type			2006	2007
			Total (Metric Tons CO ₂ Equivalent)	Total (Metric Tons CO ₂ Equivalent)
Vehicles and Equipment	Water Services	On Road Vehicles	749	841
		Off Road Vehicles	29	31
		Portable Equipment	10	5
		Deactivated During Year - Vehicle	140	73
		Deactivated During Year - Portable	1	1
		Fuel Cans	28	28
		Small Engines	<1	13
	Power Services	On Road Vehicles	131	166
		Off Road Vehicles	10	12
		Generators & Misc Equipment	5	3
		Misc Equipment	<1	<1
	Emergency Generators		26	10
	Natural Gas and Propane	Natural Gas		98
Propane		20	9	
Electricity			1,139	1,825
Tetrafluorethane in Vehicle Maintenance			5	2
Total			2,392	3,158

Electricity accounted for an increasing amount of GHG emissions while vehicles accounted for a decreasing percentage of PCWA’s GHG emissions from 2006 to 2007 (Figures 3-1 and 3-2). Although vehicle and

equipment emissions increased from 2006 to 2007, their proportion of PCWA’s emissions decreased in comparison to the increase of emissions from electricity use.

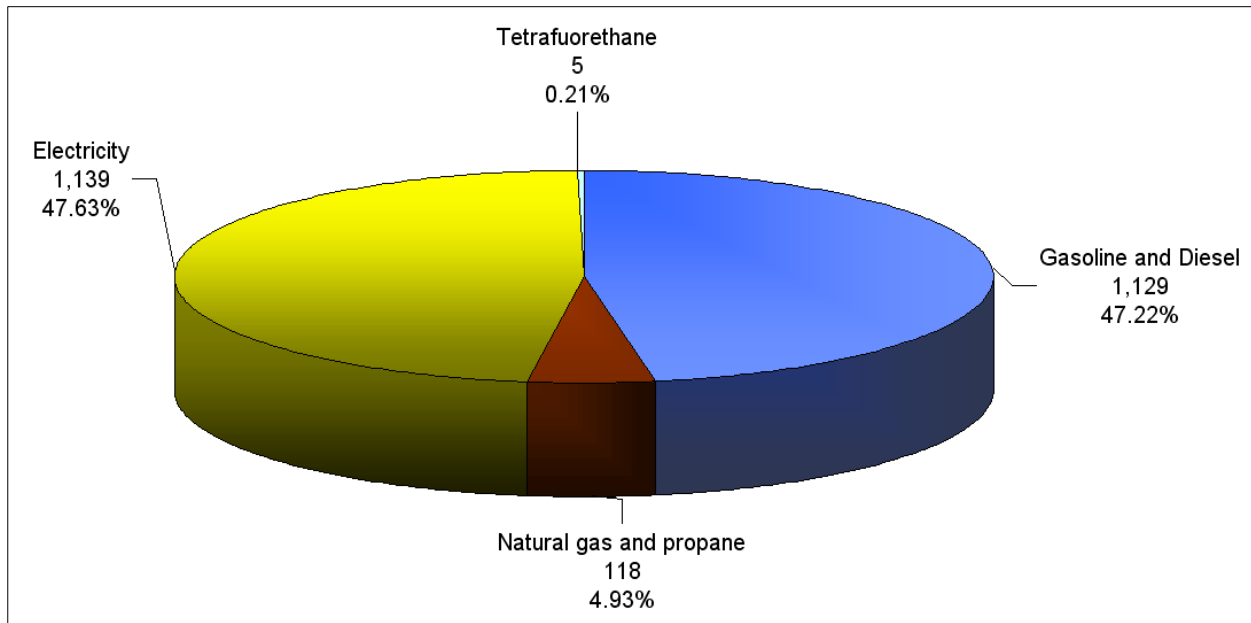


Figure 3-1. 2006 Greenhouse Gas Emissions by Emission Type (Metric Tons of CO₂e)

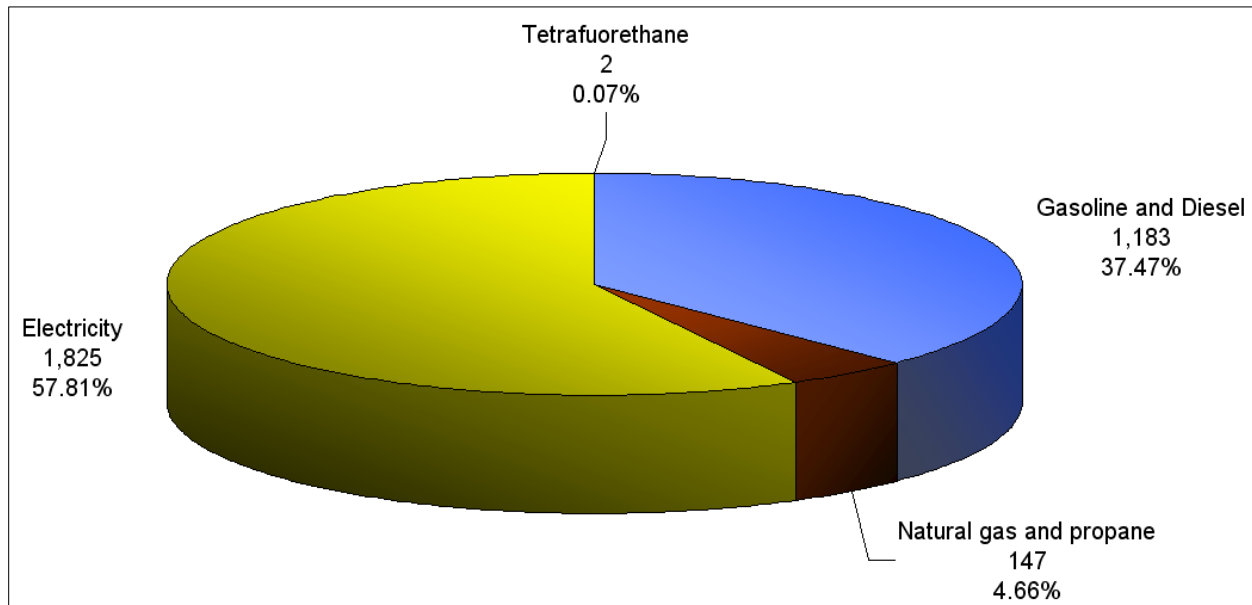


Figure 3-2. 2007 Greenhouse Gas Emissions by Emission Type (Metric Tons of CO₂e)

Electricity and vehicle use are the primary sources of GHG emissions for PCWA, as indicated in Figure 3-3. Other sources, including portable equipment, backup generators, propane, and natural gas use, account for less than 1/5th of PCWA’s GHG emissions in 2006, and less than 1/9th of GHG emissions in 2007, as shown in Figures 3-3 and 3-4.

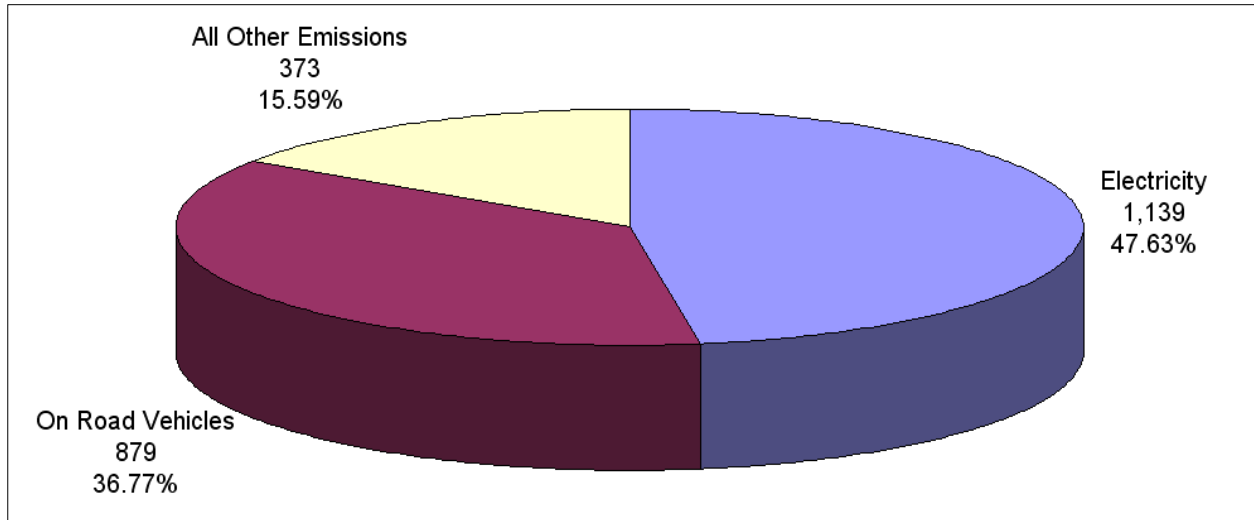


Figure 3-3. PCWA 2006 Greenhouse Gas Emissions by Energy Use Group (Metric Tons of CO₂e)

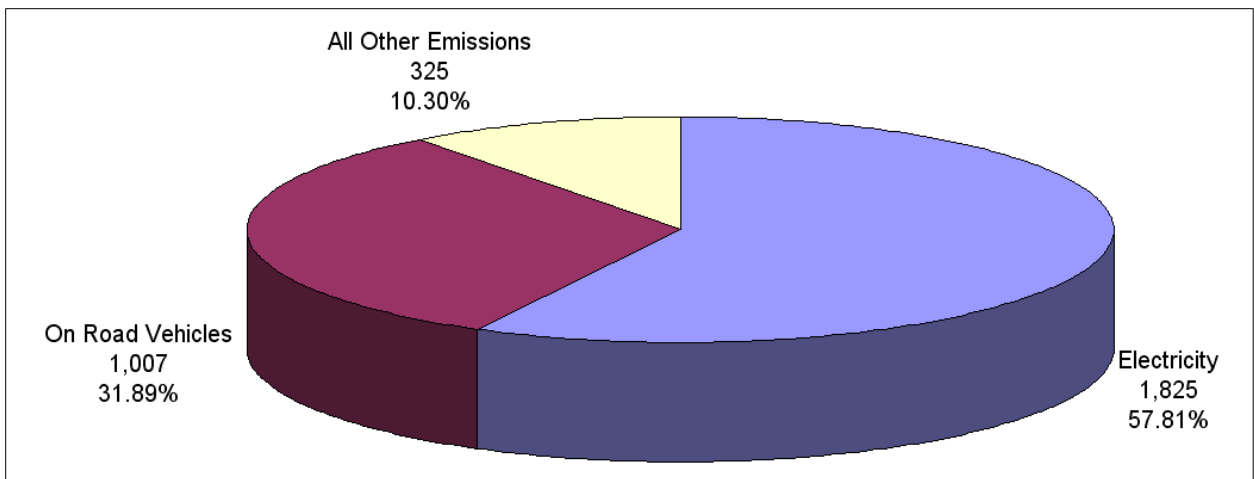


Figure 3-4. PCWA 2007 Greenhouse Gas Emissions by Energy Use Group (Metric Tons of CO₂e)

3.5 Avoided Emissions from Hydroelectric Generation

PCWA generates electricity at five hydropower facilities, generating electricity without emitting GHG into the atmosphere. Electricity generated by PCWA hydropower is used by PCWA and other PG&E electrical customers. If PG&E were to replace PCWA generated hydropower from another source, the other source

could have associated GHG emissions. The equivalent emissions from PG&E's electric profile are calculated and presented in Table 3-2.

Hydropower generated electricity is more valuable than electricity generated from fossil fuels. Electric utilities are required to monitor their carbon efficiency. Avoided emissions are not recordable under CCAR inventory guidelines, however avoided emissions may be reportable in another GHG inventory program. Additionally, electric utilities are required to meet the renewable energy goals under the California Renewables Portfolio Standard, which requires electric corporations to increase procurement from eligible renewable energy sources to 20% by 2010. This requirement makes PCWA hydropower (a renewable energy source) more valuable than regular power, and should be considered during the hydroelectric relicensing process.

Table 3-2. Greenhouse Gas Emissions Avoided by Hydropower Electricity Generation

Station	2006 Delivered Generation (kWh)	2007 Delivered Generation (kWh)	Pounds of CO2 emissions generation by PG&E avoided per kWh generated by PCWA hydropower	2006 CO2e emissions avoided (metric tons)	2007 CO2e emissions avoided (metric tons)
French Meadows	97,182,676	31,951,482	0.45581	20,093	6,606
Middle Fork Units 1 and 2	842,361,412	254,083,615	0.45581	174,162	52,533
Ralston	552,927,473	193,758,065	0.45581	114,320	40,060
Oxbow	35,408,885	15,752,749	0.45581	7,321	3,257
Hell Hole	4,836,857	4,458,993	0.45581	1,000	922
Total	1,532,717,302	500,004,904	0.45581	316,896	103,378

3.6 Summary

Since the majority of emissions are from vehicle use and electricity use, the most significant emissions reductions can be accomplished through emissions reduction efforts in these areas. Use of alternative sources of electricity (small hydropower and photovoltaic power in particular) provides electricity that does not have an associated GHG emission. Reduction of electricity use through the application of conservation alternatives (described in Section 4.3) can help reduce electricity usage, and through reduced energy use, reduce GHG emissions. Use of improved efficiency vehicles (hybrid, electric, and alternative fuels) can help reduce vehicle based GHG emissions (described in Section 4.5).

PCWA should join CCAR to formally document GHG emissions. Submitting a verified GHG emissions summary to CCAR as part of membership provides a public record of PCWA's GHG emissions. Membership in CCAR provides acknowledgement of PCWA's stewardship of the environment. The GHG emissions presented in this section and documented in Appendix E were prepared to be consistent with CCAR guidelines and are ready for input into CCAR's emissions entry tool, CARROT.

4. ENERGY AND GHG CONSERVATION ALTERNATIVES

This section describes ongoing energy conservation efforts by PCWA, the linkage between water conservation and energy conservation, and potential energy conservation and GHG reduction measures.

4.1 Existing Energy Conservation

This section summarizes the existing energy conservation measures currently being utilized at PCWA. These measures include the use of efficient motors, electrical load management, and water storage, and the practice of a conservation ethic within PCWA.

Premium efficient motors and right sizing pumps are being utilized. PCWA currently utilizes Variable Frequency Drive (VFD) motors at many of the major WTPs and pump stations. The utilization of VFD technology allows an electric controller to adjust the speed of an electrical motor by modulating the frequency of electrical power being delivered. VFD's provide continuous controls, matching motor speed to the specific demands of the amount of pumping being performed. VFD's have "soft start" capability that gradually ramp up the motor to operating speed, which lessens the startup electrical load. Single speed drive pumps start motors more abruptly, subjecting the motor to high torque and current surges up to 10 times the full load current. PCWA currently utilizes VFD technology at several facilities, including all of PCWA's WTPs and several pumps stations such as the Tinker Road and Laird pump stations.

Energy efficient motors are utilized at the Auburn and Foothills WTP. Energy efficient motors, also called premium or high-efficiency motors, are on average up to 8% more efficient than standard motors. These motors meet or exceed the efficiency levels listed in the National Electric Manufacturers Association's (NEMA's) MG1-1993 publication. Pumps and blower motors account for 80 to 90% of the energy cost in water treatment and pumping (Elliot, 2003), and the lifetime energy cost to run a continuous-duty motor can be 10 to 20 times higher than the original motor purchase prices.

Energy smart lighting and electrical load management are being utilized to reduce energy consumption during peak demand periods. Electrical load management has also been used in shifting electrical loads to off-peak schedules. Electrical load management utilizes awareness that electrical rate schedules are structured to encourage customers to minimize high energy consumption during peak periods (U.S. Environmental Protection Agency, 2008a). Reducing operational functions, unnecessary lighting, heat, ventilation and air conditioning (HVAC), and pumping during peak hours are ways PCWA has performed electrical load management to reducing electrical energy consumptions. Electrical load management is being performed at the staff level.

PCWA staff is making a conscious effect in electricity conservation awareness. Staff members are making sure lights in office complexes and other buildings are turned off when there is no occupancy. Use of HVAC is minimized when building space is unoccupied. HVAC and lighting use is minimized for nominal usage during working hours. Electricity use at the PCWA Business Complex, the Auburn, Bowman, and Foothill WTPs, and unoccupied or partial use facilities benefit from conservation awareness.

Water storage and gravity flow operations are utilized to reduce energy consumption. Water storage is currently being utilized throughout PCWA water systems providing raw and treated water storage for providing adequate system pressure and eliminating the need for numerous booster pump stations. Water storage provides PCWA the ability to pump and store water during off-peak hours. Gravity flow operations

allow PCWA to capture water from high elevations and transport the water through canal systems to water storage or WTPs without the assistance of pumps.

4.2 Linkage between Water and Energy Conservation

There is a strong linkage between water and energy conservation. A significant portion of the cost of delivering water includes the cost of energy used to pump and treat water. Therefore, using water more efficiently results in reduced energy use and cost. This section discusses this water and energy linkage and how to better target water conservation efforts to maximize energy savings.

PCWA is a signatory in the *Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California*, which formalizes an agreement to implement 14 water conservation best management practices (BMPs) and makes a cooperative effort to reduce the consumption of California's water resources. The MOU is administered by the California Urban Water Conservation Council (CUWCC). PCWA, by signing the MOU, has pledged to develop and implement the cost effective BMPs. A BMP is determined to be cost effectiveness if the cost to implement a BMP is less than the cost to supply the amount of water that is saved, and is typically expressed in terms of dollars per ac-ft. The cost to supply the next increment of water is also referred to as the value of saved water or the marginal cost of new water supplies. The value of saved water per ac-ft includes the total cost to divert, treat, and deliver that next ac-ft increment of supply. The value of saved water is determined by annualizing the capital cost of new water supply and treatment facilities and adding the operational costs, including power. The higher the value of saved water, the more cost effective BMPs become. A weakness of current approaches to evaluate the cost effectiveness of BMPs is that a uniform value of saved water is typically used. This approach overlooks that the value of saved water can vary significantly by supply source and by season and time of day.

In a 2006 analysis of BMPs conducted for PCWA, a \$450 per ac-ft total value of conserved water was used (Brown and Caldwell, 2006). As presented in Table 2-7, the average electrical used by PCWA to supply treated water is 165 kWh per ac-ft, which equates to \$23 per ac-ft in electrical cost using the average cost of \$0.14 per kWh. The electrical use to supply treated water from the MFP and CVP supplies is 882 kWh or \$123 per ac-ft, which is much greater than the average electrical use because of the pumping through the ARPS and the ATPS. Clearly, the power portion of the value of saved water varies significantly by water supply source for PCWA.

Another variable is the cost of electricity, which is higher during the summer, particularly during summer afternoons. For example, the electrical rate for the ATPS is as high as \$0.37 per kWh from noon to 6 pm, Monday to Friday, May 1 to October 31, as presented in Table 2-11. Therefore, the power portion of the value of saving water in a summer afternoon from the MFP and CVP supplies is even a greater value. A key conclusion is that the value of water saved from water conservation efforts is greatest for the MFP and CVP supplies that are pumped from the American River and the value is the greatest for water saved during a summer afternoon.

PCWA would maximize its energy cost savings by targeting its water conservation efforts on the MFP and CVP supplies, with a particular emphasis on summer water use. It is recommended that PCWA evaluate the water conservation BMPs and consider that the value of saved water varies significantly by water supply source and time of year.

4.3 Future Energy Conservation and Optimization Measures

This section summarizes potential energy conservation and optimization measures that could be implemented by PCWA to raise the level of energy conservation.

Energy conservation has been a growing element in California's energy use policy and goal setting requirements as California continues to grow in population. The Warming Solutions Act of 2006 caps California's GHG emissions at the 1990 level by 2020. Achieving this goal requires California to cut emissions by 29 percent. Energy conservation and GHG emissions reduction are directly related.

Energy conservation is the practice of decreasing the quantity of energy used. This may be achieved through several ways by utilizing efficient energy use, optimizing processes and equipment, reducing consumption of fossil fuels, and employee conservation awareness programs. PCWA water treatment and pumping electrical use is approximately 87% of PCWA total electrical use and is expected to increase dramatically as outlined in Section 2.2. Fossil fuel use represents approximately 25 percent of PCWA energy cost. Reducing the need and use of fossil fuel resources also reduces cost and the overall impact on the environment. The following section presents categories of energy conservation that have been used successfully by other agencies to reduce energy use, many of which could be implemented by PCWA.

4.3.1 Energy Conservation Alternatives by Category

Energy conservation can be loosely grouped into a number of general categories, including pumping, process, on-site power generation, vehicle fleet usage, lighting, equipment, HVAC, and general operations, and are discussed below. Energy conservation alternatives within each category are detailed in Table 4-1.

The pumping category focuses on reducing energy consumption by increasing pump efficiencies. A pump's primary job and energy use is to provide lift and move water. Pumps lose a considerable amount of energy from friction and vibrational forces in the system. Increasing the pumps overall efficiency allows the pump to direct more of the energy to the move water versus to overcoming friction, vibration, and turbulence, performing the same work with less energy (Department of Energy, September 2006f). Several ways of increasing a pump's efficiency is by right sizing a pump, using the correct size pump for the volume of water being moved. Trimming oversize impellers, replacing worn parts, and eliminating excessive head are also ways to increase a pump's efficiency (Hydraulic Institute, 2000).

The process category focuses on reducing energy consumption by reviewing PCWA current water treatment and pumping operations. Process energy reduction focuses on assessing process piping and pumps for proper installation and condition. Determining process piping and pump condition and performance is an important process in determining where system can be optimized. Inspection of pipes can identify where high fouling is causing excessive head build up against pump. Increasing water storage and rescheduling plant process pumping where applicable to off-peak hours would lower energy cost by utilizing electrical utilities off-peak rate schedules and cleaner power during the off-peak hours.

The vehicle fleet usage category focuses on reducing fossil fuel use and using alternative fuel or hybrid vehicles for energy conservation. Reducing PCWA's overall fossil fuel usage not only decreases PCWA energy use but also decreases direct GHG emissions. Decreasing fossil fuel usage related to vehicle fleet can be achieved by right sizing vehicle selection for the specified job task. Hybrid vehicles and alternative fuel vehicles can be used to reduce the usage of fossil fuels by using cleaner burning fuels and stored electricity (National Renewable Energy Laboratory, 2008c). Vehicle fleet alternatives are discussed in Section 4.5.

The system lighting category focuses on reducing the quantity of low efficient lamps and amount of lighting used. Replacing low efficiency lamps with high efficient lamps throughout a process area or business complex can reduce electrical cost and use from lighting by up to 15 percent (U.S Environmental Protection Agency, 2008a). Delamping, or minimizing the number of lamps required in a light fixture to the minimal acceptable level defined by the Illuminating Engineering Society of North American level of occupant comfort eliminates unnecessary lighting (Lane, 2001). Placing timing sensors and using ambient lighting during work hours to reduce electrical consumption and unnecessary lighting of unoccupied spaces would also contribute to energy conservation (California Energy Commission, 2008d).

The HVAC category is focused on reducing energy use by maintaining and optimizing HVAC units for high efficiency and monitoring HVAC loading of buildings. Possible actions include reducing HVAC system operation when building or spaces are unoccupied, adjusting areas that are too hot or cold, and reducing unnecessary heating and cooling to save energy (U.S Environmental Protection Agency, 2008a). Equipment condition and performance checks should be performed to ensure HVAC units are functioning correctly.

The general PCWA operations category, also known as employee conservation awareness, focuses on increasing energy conservation by increasing staff awareness of energy conservation. Conservation in this category includes power saving modes and settings for digital equipment, normal building maintenance including the checking and changing of air filters to ensure HVAC equipment has proper unobstructed flow to minimize equipment usage, ensuring high efficient light bulbs are installed and used, and unoccupied space lighting control (U.S Environmental Protection Agency, 2008a).

Table 4-1 outlines energy conservation measures by category which PCWA could implement for energy conservation.

Table 4-1. Energy Conservation Category Listings

Energy Conservation Measures by Category	Comments
Pumping Category	
Right size oversized water pumps	Identify and retrofit pumps that are too large for the volume of water being pumped.
Eliminate excess head in pumping operation	Reduce system pressures to reduce pumping energy requirements.
Trim oversized pump impellers	Identify and retrofit pumps that have large impellers for the volume of water being pumped.
Review the water pump packing	Identify and retrofit pump bearings and packing to modern, high efficiency bearings.
Install VFD were applicable	Identify locations, purchase, and install VFD drives where appropriate.
Process Category	
Test, clean, and upgrade pumps	Condition and performance testing will indicate process efficiency.
Test, clean, and upgrade pipes	Old pipes and process pipes need condition and performance assessments to determine if fouling is occurring. Fouling of pipe causes increase friction to pump against. Condition and performance testing of pipes will indicate internal condition of pipes and allow energy efficiency determinations to be made.
Inspect process pipes for leaks	Leaks in existing pipes such as cooling water or heating water cause water loss and energy loss.
Reschedule water pumping to off-peak hours	Off-peak pumping shifts power usage from high peak times to off-peak schedules. This shift allows cleaner and less expensive electrical energy to be used.
Increase water storage capacity	Increase water storage allows for off-peak pumping to fill storage tanks. Storage tanks can then be used to supply water needs during peak hours, eliminating pumping during peak hours.
Water source heat pump for process heating	Utilize a water heat source pump to heat water.
Use high-efficiency blowers	Purchase and install modern high efficiency blowers.
Energy efficient belt drives	Belt drives are to transmit power from a motor to a pump or blower. This alternative would purchase and install modern, high efficiency belt drives.
Reschedule backwashing to occur at off-peak hours	Backwashing process use pumps and blowers. Rescheduling the backwash process to occur at off peak hours will decrease the peak demand on the system and lower energy cost.

Table 4-1. Energy Conservation Category Listings (continued)

Energy Conservation Measures by Category	Comments
Vehicle Fleet Usage Category	
Right size vehicle	Right sizing vehicle for task use for reducing fossil fuel usage.
Hybrid vehicles	Hybrid vehicles are a vehicle that uses two or more distinct power sources to propel the vehicle. The most common power sources are internal combustion engine fueled by fossil fuels and rechargeable energy storage system such as batteries.
Electric Vehicles	Electric vehicles are vehicles with one or more electrical motors used for propulsion. Unlike an internal combustion engine that is tuned to specifically operate with a particular fuel such as gasoline or diesel, an electric drive vehicle needs electricity, which comes from sources such as batteries, fuel cells, or a generator.
Retire older vehicles	Retiring older, less efficient vehicles will decrease higher fossil fuel use and allow for more efficient travel.
Alternative fuels	Alternative fuel vehicles consist of ethanol, biodiesel, natural gas, propane, and hydrogen. Ethanol is produced domestically from corn and other crops. Biodiesels are derived from vegetable oils and animal fast. Compressed natural gas (CNG) is a fossil fuel that generates less air pollutants and greenhouse gases than gasoline or diesel fuel. Propane or liquefied petroleum gas (LPG), is a domestically abundant fossil fuel that generates less harmful pollinates and greenhouse gases. Hydrogen can be produced from fossil fuels. Fuel cell vehicles powered by pure hydrogen emit no harmful air pollutants.
System Lighting Category	
Upgrade T12 lamps (1-1/2in diameter) and magnetic ballasts with T8 lamps (1-inch diameter) and electronic ballasts	Replacing lamps and ballast with more efficient light lamps and ballast can produce an energy savings of up to 20%.
Apply motion sensor and photocells	Motion sensors and photocells lights to be only used during movement in a room or by timed durations, minimizing lighting areas with no occupancy.
Replace metal hylites with compact fluorescent and motion sensors	Replacing incandescent lights with more efficient lighting and reducing use through motion sensors provides energy savings
Use energy efficient lights for outdoor lighting	Replacing outdoor lighting with high efficiency lights to reduce energy consumption and increase energy savings.
Add vending misers to beverage machines	Vending misers consist of a motion sensor and timer and monitors vending machines. A typical beverage vending machine use is 3,500 kWh is a year, at \$0.10/kWh, the cost to operate the beverage machine is \$350 per year. If no motion is sensed in a 15 minute period the miser shuts down the vending machine and allows the vending machine to control its internal thermostat to keep cold items cool.
Utilize day-lighting when applicable	Utilizing day-lighting is allowing enough natural ambient light to enter a working space that electrical lighting is not necessary.
Install multi-level switching	Multi-level switching allows the occupant to adjust lighting illumination level.
Upgrade exit signs with light-emitting diode (LED) lamps	Upgrading exit signs with LED provides longer illumination life and uses lower energy.
Delamping and adding reflectors of lights to minimum level of IESNA levels	Delamping and adding reflectors requires removal of typical fluorescent lighting system to the minimum IESNA level for occupant comfort. Delamping removes unnecessary lights.

Table 4-1. Energy Conservation Category Listings (continued)

Energy Conservation Measures by Category	Comments
Equipment Category	
Reduced voltage motor starters	Used to "soft" start or reduce the in-rush current to accommodate a weak distribution system or to reduce the kW demand to equipment during the starting phase.
Perform equipment tune-ups and upgrades	Equipment tune-ups and upgrades help maintain equipment efficiencies.
Use high efficiency boilers	Purchase and install modern high efficiency boilers.
Use high efficiency water chillers	Purchase and install modern high efficiency water chillers.
Compressor sequencer	Allows operation areas that use more than one compressor to be sequenced to minimize the number of compressing cycles.
HVAC Category	
Solar thermal heating system	Used to trap solar energy and use for heating purposes.
Perform equipment tune-ups and upgrades	Equipment tune-ups and upgrades help maintain equipment efficiencies.
Replace old HVAC systems to new efficient systems	Updating old equipment to new and more energy efficient equipment.
Properly insulate to hot & cold piping	Proper insulation techniques allows for hot and cold piping system to run more energy efficient and not produce high system cycling.
Insulate equipment	Insulating equipment where applicable to ensure excessive energy loss is not occurring and causing equipment to have to operate longer for intended use.
Reduce the pump station ventilation when unoccupied.	Reduce air circulation at unoccupied facilities.
Add a Thermal Energy Storage (TES) system for off-peak cooling	Off-peak cooling, or thermal energy storage (TES), is an alternative to conventional chiller operation in commercial buildings. Off-peak electricity is used to provide some or all of a building's cooling requirements by chilling thermal-storage media during times of low electrical demand.
Consider water source heat pump for heating	Heat pumps use electricity to move heat from a cool space into a warm space, making the cool space cooler and the warm space warmer.
Evaluate evaporative coolers for space cooling	That's evaporative cooling: the reduction in air temperature that occurs when water evaporates. Evaporative coolers, commonly called "swamp coolers," use this effect to cool homes. Evaporative coolers have a low first cost, use a lot less electricity than conventional air conditioners, and do not use refrigerants, such as chlorofluorocarbons (CFCs) and hydro chlorofluorocarbons (HCFCs), which can harm the ozone layer.
Use "double pane" skylights to reduce lighting energy needs.	Double pane sky lighting reduces internal lighting needs by using natural ambient light during electrical peak hours.
Reduce building outside air (OSA) to minimum level	Reducing outside air recirculation will cut down on building fan use.
Use a central system in lieu of packaged units	Central air conditioning systems provide more energy efficient air conditioning supply than stand alone packages.
Add a combined heat and power system	Combined heat and power (CHP) systems (also known as cogeneration) generate electricity (and/or mechanical energy) and thermal energy in a single, integrated system.
General Agency Operations Category	
Ensure proper equipment setup	Ensuring proper equipment setup maximizes all energy save modes and energy efficiency modes as possible.
Power save modes	Ensure power save modes on equipment to reduce electrical energy use when not in service.

Table 4-1. Energy Conservation Category Listings (continued)

Energy Conservation Measures by Category	Comments
Power down after period of inactivity	Use power down modes to stop electrical energy consumption when equipment is not being used.
Maintain the building ventilation air filters	Maintaining building filters allows for maximum volume of air flow through building and reduces unnecessary air loading periods.
O ₂ sensors and time clocks to reduce ventilation rates during unoccupied periods.	O ₂ and timing clocks regulate the amount of necessary ventilation needed for occupant comfort.
Consider a passive solar heating system	Passive solar heating systems use sunlight for energy without active mechanical systems (as contrasted to active solar). Such technologies convert sunlight into usable heat (water, air, and thermal mass), cause air-movement for ventilating, or store heat for future use, without the assistance of other energy sources.

4.3.2 Recommended Energy Conservation Alternatives

The previous section provided a global list of energy conservation measures which provide varying degrees of energy savings. A number of energy conservation categories and measures that could provide the most significant energy savings for PCWA include:

- Right sizing pumps by performing condition and performance assessments to determine if pumps are optimally sized for current flow and pressure conditions.
- Evaluating locations for increased water storage to allow for more off-peak pumping operations and utilizing water storage to assist in water treatment processes such as backwashing filters.
- Right sizing vehicle use to task.
- Investing in alternative vehicles such as hybrid cars and trucks.
- Optimizing vehicle travel routes.
- Checking system piping for leaks and minimizing water loss.
- Installing premium energy efficient motors where older less efficient motors exist.
- Installing low energy use lighting and lighting fixtures.

4.4 Water Treatment and Distribution System Energy Optimization

This section identifies operations alternatives to optimize energy use for the operation of PCWA's WTPs and water distribution system.

4.4.1 Water Treatment Plant Optimization

The operations of PCWA's WTPs have been reviewed with the intent of identifying alternatives to optimize energy use at the plants. Optimizing a water treatment process for energy use could provide environmental benefits such as reduced carbon and landfill impacts. A summary of the optimization alternatives for the Auburn, Bowman, and Foothill WTPs is provided below.

4.4.1.1 Auburn Water Treatment Plant

The Auburn WTP, located in the northern part of Zone 1, has a 5 million gallons per day (mgd) capacity and is used during periods of high demand. The Auburn WTP was replaced in 2007 by a new plant with an initial capacity of 8 mgd. Recommended operations alternatives to optimize energy use are as follows:

- a) **Time of day for centrifuge sludge dewatering activities.** At facilities with twenty-four hour operations, conducting centrifuge sludge dewatering activities at night may result in lower energy costs, depending on the electric rate schedule. This measure should include an assessment of the rate structure to optimize the potential savings.
- b) **Backwash water and filter-to-waste recycle.** This operation pumps water to the head of the plant instead of disposing backwash water. This could save energy if cost to filter and pump backwash water is less than the cost of pumping new supply water to the WTP to replace backwash water. In addition, the cost to treat the water in the wastewater treatment plant, which is the other likely point of disposal, should also be considered.

4.4.1.2 Bowman Water Treatment Plant

The Bowman WTP, located in Zone 1, has a maximum daily capacity of 7 mgd and is used as the primary treatment facility in the northern part of Zone 1. Recommended operations alternatives to optimize energy use are as follows:

- a) **Water quality based operations.** The Bowman WTP should use the larger 5 mgd WTP during the better water quality periods and then use the 2 mgd WTP for the low water quality periods or during higher demand periods, to maximize efficiency gains from using the larger facility. PCWA staff report that this approach is currently being implemented.
- b) **Chemical concentration.** Receiving chemicals in a more concentrated form and diluting them at the WTP would have an overall lower energy footprint.
- c) **Change from mechanical to hydraulic mixing and flocculation.** The conventional WTP at the Bowman facility could benefit from coagulation mixers and flocculation that utilize a hydraulic flocculation system instead of a mechanical system to reduce energy consumption. This modification has been implemented in the City of Antioch's conventional WTPs. A cost evaluation of this option is recommended as a first step.
- d) **Backwash water and filter-to-waste recycle.** This operation pumps water to the head of the plant instead of disposing backwash water. This could save energy if cost to filter and pump backwash is less than the cost of pumping new supply water to the WTP to replace backwash water. In addition, the cost impact of disposing the backwash water properly should be considered.
- e) **Future centrifuge dewatering project.** PCWA staff mentioned a future centrifuge dewatering project at the Bowman WTP. This process would increase the energy use at the plant. Non-mechanical dewatering options should be considered and may be worth a review to ensure the life-cycle costs are accurate. The percent solids would have a cost impact by increasing overall trucking costs.

4.4.1.3 Foothill WTP

The Foothill WTP has a maximum daily capacity of 55 mgd and is used as the primary treatment facility in the southern part of Zone 1. Recommended operations alternatives to optimize energy use are as follows:

- a) **Backwash water and filter-to-waste recycle.** This operation pumps water to the head of the plant instead of disposing backwash water. This could save energy if cost to filter and pump backwash is less

than the cost of pumping new supply water to the WTP to replace backwash water. In addition, the cost impact of disposing the backwash water should also be considered.

- b) **Increase filter backwash storage.** Storing water in the existing storage tank, although not sized for full backwash flow, should allow some use of off-peak pumping. There is also potential to build a larger storage facility for backwash storage, if facility space is available.
- c) **Pretreatment process choice.** The Foothill plant has a new side (Actiflo) and an old side (conventional sedimentation). The operators appear to favor the new Actiflo side since it works best for a wider range of water quality scenarios. Actiflo is more energy intensive, and it may conserve energy to treat water with the conventional sedimentation side of the WTP when possible. A study should be conducted to determine the feasibility of increasing use of conventional treatment, as long as utilizing conventional treatment has no negative impact on treated water quality.
- d) **Change from mechanical to hydraulic mixing and flocculation.** The conventional side at the Foothill facility could benefit from coagulation mixers and flocculation that utilize a hydraulic flocculation system instead of a mechanical system to reduce energy consumption. This modification has been implemented in the City of Antioch's conventional WTPs.

4.4.2 Distribution System Optimization

A summary of some energy-saving measures that could be used in the water distribution system is provided below. A more detailed analysis utilizing the system's hydraulic model could be performed to determine actual infrastructure improvements.

- a) **Decrease the volume of water pumped.** A pressure zone analysis would determine if pressure zone boundaries could be adjusted to ensure the optimal volume of water is being pumped within the service area.
- b) **Lower the head against which water is pumped.** The water system delivery pressure could be reduced. Another option is to optimize the tank water level range for energy efficiency.
- c) **Utilize off-peak electricity rates.** Avoid peak hour pumping and make effective use of storage tanks by filling them during off-peak periods and draining them during peak periods.
- d) **Increase the efficiency of pumps.** Ensure that pumps are operating near their best efficiency point and that premium efficiency motors are used. PCWA staff reports that this activity has recently been completed.
- e) **Implement on-line telemetry and control systems (SCADA).** Use SCADA to operate the distribution system and control reservoir levels to optimize energy consumption within the distribution system.
- f) **Determine pipelines of high headloss within the system.** Identify areas of pipeline with high headloss and change operations to reduce headloss. Pumping costs within the distribution system are a function of pipe diameter as diameter relates to velocity and unit head loss within the pipelines.

4.5 Greenhouse Gas Emission Reduction Alternatives

This section identifies a list of potential GHG emission reduction alternatives for direct emission sources. Since on-road vehicles produce the greatest emissions from direct sources, they provide the greatest potential for reductions. Because direct emissions from small gasoline powered equipment and generators are less than 2% of total GHG emission from PCWA facilities and activities, GHG reduction alternatives for these

emission sources are not discussed. Electricity conservation is discussed in Section 4.3 of the report. Reducing electricity use results in a reduction of indirect GHG emissions.

4.5.1 Vehicles

Vehicles are PCWA's second largest contributor to GHG emissions. PCWA operates a large fleet of vehicles, including cars, vans, and trucks of many types and sizes. Transportation-related fuel consumption accounts for 39.86% of total GHG emissions from PCWA facilities and activities (2006 Metric Tons CO₂ equivalent). In addition, because of new facilities going on line and additional service area growth, more emissions of GHG's and other air pollutants from mobile sources are likely in future years.

The following transportation-related alternatives provide GHG reduction benefits:

Vehicle Fuel Efficiency

- Retire old and under-used vehicles.
- Purchase fuel efficient (e.g., hybrid) and/or smaller fleet vehicles.
- Utilize a routing study to determine the most efficient routes for routine monitoring, maintenance, and meter reading.

Alternative Fuels

- Utilize biodiesel in agency fleet currently burning diesel.
- Utilize ethanol in agency fleet currently burning gasoline.
- Utilize electric vehicles in PCWA fleet for use in confined environments like warehouses, in-town commuting, meter readers, or others who require limited travel distances and parking convenience. PCWA is already implementing this option.
- Utilize compressed natural gas in PCWA fleet.

Trip Reduction / Demand Management

- Encourage car-pooling or van-pooling by employees.
- Encourage telecommuting by employees.
- Encourage use of mass-transit by agency employees.

Other Transportation-Related Measures

- Implement engine idling reduction programs/operations. Any off-road diesel vehicle fleet with over 2,500 hp is required to develop a written idling policy and have it available to vehicle operators by March 1, 2009, as identified in the *Written Idling Policy Guidelines* (CARB 2008).
- Provide driver education and outreach program.
- Install automatic idle shut-offs.
- Replace off-road equipment (e.g. fork lifts) with modern electric drive equipment that will reduce emissions and improve performance.
- Implement a tire pressure checking program.

Table 4-2 provides a summary of the pros and cons of alternative fuel vehicles.

Table 4-2. Alternative Fuel Pros and Cons

	Pros	Cons
Compressed natural gas	<ul style="list-style-type: none"> • Almost any existing gasoline car can be turned into a bi-fuel (gasoline/CNG) car. • Cleaner burning than gasoline or diesel fuel, 60-90% less VOCs, 30-40% less greenhouse gas emissions. ^a • Impact on NOx emissions have varied. • CO2 reductions by 25% ^a • Less expensive than gasoline ^a 	<ul style="list-style-type: none"> • Compressed natural gas vehicles require a greater amount of space for fuel storage than conventional gasoline power vehicles. • Compressor stations are very expensive to install. • Limited vehicle availability. • Less readily available than gasoline and diesel. Can only use within driving distance of the compressor station. CNG generally not available in the general market although availability is good in the immediate area of Auburn, CA. May not be useful for vehicles driving long distances. • Fewer miles on a tank of fuel. • Potential increase in nitrogen oxide emissions in retrofitted vehicles.
Propane or liquefied petroleum gas (LPG)	<ul style="list-style-type: none"> • Emission results have varied. Manufactured vehicles have performed better than converted vehicles. • 85% of LPG used in U.S. comes from domestic sources. ^b • Less expensive than gasoline. ^b 	<ul style="list-style-type: none"> • No new passenger cars or trucks commercially available (vehicles can be retrofitted for LPG). ^b • Less readily available than gasoline & diesel. ^b • Availability is very limited in the immediate area of Auburn, CA • Fewer miles on a tank of fuel. ^b
Bio-diesel	<ul style="list-style-type: none"> • Yields 93% more energy than the energy invested in its production. • GHG emissions reduced by 41%. ^c • Impact on NOx emissions have varied. • Diesel drivers can transition to biodiesel without purchasing new vehicles. In the case of fleets, managers can transition to biodiesel without acquiring new spare parts inventories or rebuilding refueling stations. • Generally, the use of biodiesel does not cause many maintenance issues. Maintenance issues can be minimized by cleaning tanks, changing rubber seals, etc. Also, improved lubricity may actually extend the life of the engine. 	<ul style="list-style-type: none"> • A 2002 EPA summary analysis of existing data suggests vehicles using biodiesel may emit slightly more nitrogen oxide (NOx) (about 2% for B20 and 10 percent for B100). Subsequent studies have yielded mixed results, with some showing small increases and others showing small decreases. • Biodiesel generally costs more than petro diesel. • Biodiesel distribution and retail infrastructures are growing slowly. Availability is very limited in the immediate area of Auburn, CA.
Ethanol (corn grain)	<ul style="list-style-type: none"> • Yields 25% more energy than the energy invested in its production. ^e • GHG emissions reduced by 12%. ^d 	<ul style="list-style-type: none"> • Large nationwide demand has resulted in competition for corn between ethanol producers and the food supply. Pure ethanol or E85 is not available in the immediate vicinity of Auburn, CA.

Table 4-2. Alternative Fuel Pros and Cons (continued)

	Pros	Cons
Hybrid electric vehicles	<ul style="list-style-type: none"> • Auto manufacturers have begun to produce Hybrid Electrical Vehicles (HEVs) with comparable performance, safety, and cost to conventional vehicles. • Improved fuel economy reduces GHG emissions and provides savings to help offset the incremental capital cost of the vehicle. 	<ul style="list-style-type: none"> • Will never be true zero-emission vehicles because of their internal combustion engine. • Cost is more than a comparable, mass produced gasoline or diesel powered vehicle. • There is currently a limited selection of hybrid vehicles available.
Electric	<ul style="list-style-type: none"> • Several major auto manufacturers are producing high-performance Electrical Vehicles (Evs), including passenger cars, minivans, sport utility vehicles, pickup trucks, and buses. • EVs do not require tune-ups or oil changes associated with conventional vehicles. 	<ul style="list-style-type: none"> • At \$15,000 to \$40,000, EVs cost more than comparable, mass-produced gasoline- or diesel-powered vehicles. • Currently, a large drawback is that the driving range of EVs is much less than that for gasoline- or diesel-powered vehicles. Depending on battery type, climate, and terrain, an EV can travel from 40 to 120 miles on a single battery charge. • Space considerations with EVs because their batteries can be large and heavy, resulting in less room for cargo or passengers, (although, battery technology is changing rapidly).

^a<http://www.fueleconomy.gov>

^b www.fueleconomy.com

^c Barrett Consulting Associates. July 2004. *Assessing Bio-diesel in Standby Generators for the Olympic Peninsula, Final Report.*

^d Relative to the fossil fuels they displace.

^e Jason Hill Et Al. June 2, 2006. *Environmental, Economic, and Energetic Costs and Benefits of Biodiesel and Ethanol Biofuels.*

4.5.2 Association of GHG Reduction Alternatives with Energy Reduction

Table 4-3 summarizes the potential GHG emission reduction alternatives in comparison to the energy conservation measures that are outlined previously in this section. Energy conservation measures that are also potential direct or indirect GHG emission reduction alternatives are identified with an “X”. As discussed in Section 3 of this report, indirect emissions are emissions that occur because of an entity’s actions, but are produced by sources owned or controlled by another entity. Indirect emissions generally occur from electricity, steam, and heat purchases, however most indirect emissions occur from electricity purchases. Direct emissions are emissions that are from sources that are owned or operated by the entity.

Table 4-3. Comparison of Potential GHG Emission Reduction Alternative with Energy Conservation Measures

Energy Conservation Measures	Potential GHG Emission Reduction Alternative		Notes
	Direct	Indirect	
Pumping Category			
Right size oversized water pumps		X	
Eliminate excess head in pumping operation		X	
Trim oversized pump impellers		X	
Review the water pump packing			
Install VFD were applicable		X	
Recirculate pump station ventilation		X	
Process Category			
Test, clean and upgrade pumps		X	
Inspect process pipes for leaks		X	
Reschedule water pumping to off-peak hours			No energy reduction.
Increase water storage capacity			No energy reduction.
Water source heat pump for process heating	X		
Use high-efficiency blowers		X	
Use high-efficiency, single stage blowers when applicable		X	
Install energy efficient belt drives		X	
Reschedule backwashing to occur at off peak hours			No energy reduction.
Vehicle Fleet Usage Category			
Right size vehicle	X		
Use hybrid vehicles	X		
Use electric Vehicles	X		This can reduce PCWA's direct emissions, but can potentially increase indirect emissions through increased electricity usage.
Retire older vehicles	X		
Implement an idling program	X		
Use alternative fuels	X		
System Lighting Category			
Upgrade T12 lamps (1-1/2in diameter) and magnetic ballasts with T8 lamps (1-inch diameter) and electronic ballasts		X	
Apply motion sensor and photocells		X	
Use energy efficient lights for outdoor lighting		X	
Replace metal hylites with compact fluorescent and motion sensors		X	

Table 4-3. Comparison of Potential GHG Emission Reduction Alternative with Energy Conservation Measures (continued)

Energy Conservation Measures	Potential GHG Emission Reduction Alternative		Notes
	Direct	Indirect	
Install vending misers to beverage machines		X	
Utilize day-lighting when applicable		X	
Install multi-level switching		X	
Upgrade exit signs with light-emitting diode (LED) lamps		X	
Delamp and add reflectors of lights to minimum level of IESNA levels		X	
Equipment Category			
Install reduced voltage motor starters		X	
Perform equipment tune-ups and upgrades		X	
Use high efficiency boilers		X	
Use high efficiency water chillers		X	
Use compressor sequencer		X	
HVAC Category			
Install solar thermal heating system		X	
Perform equipment tune-ups and upgrades		X	
Replace old HVAC systems to new efficient systems		X	
Properly insulate to hot & cold piping		X	
Insulate equipment		X	
Use building energy management system		X	
Reduce the pump station ventilation when unoccupied.		X	
Add a Thermal Energy Storage (TES) system for off-peak cooling		X	
Consider water source heat pump for heating	X		
Evaluate evaporative coolers for space cooling		X	
Use "double pane" skylights to reduce lighting energy needs		X	
Reduce building Out Side Air (OSA) to minimum level		X	
Use a central system in lieu of packaged units		X	
Consider a heat recovery run around loop		X	
Add a combined heat and power system		X	
General Agency Operations Category			
Ensure proper equipment setup		X	
Use power save modes		X	
Power down after period of inactivity		X	
Maintain the building ventilation air filters		X	
Use O ₂ sensors and time clocks to reduce ventilation rates during unoccupied periods.		X	
Consider a passive solar heating system		X	

4.5.3 GHG Reduction Recommendations

The most effective conservation and emission reduction measures target areas of use that comprise the majority of emissions. Electricity, gasoline, and diesel use accounted for 95% of PCWA GHG emissions in 2007. Consequently, GHG reduction measures should include the electricity conservation measures described in Section 4.3 and vehicle efficiency measures described in this section.

Vehicle efficiency can be increased most cost effectively by converting from diesel to biodiesel, and converting to new, more efficient technologies. Replacement of retired gasoline vehicles with CNG or electric hybrid vehicles as available on a case by case basis would reduce gasoline use. Replacement of diesel vehicles that do not have high power requirements with CNG or electric hybrids would conserve diesel fuel.

5. ALTERNATIVE ENERGY SOURCES

This section defines and describes potential alternative energy sources. Each potential alternative energy source is described for type, size, cost, output, and other considerations. There are several potential sources of renewable and alternative energy currently used in the US:

- Solar Photovoltaic and Passive Solar
- Wind
- Biomass
- Hydropower
- Geothermal
- Water Source Heat Pumps

Electric power generation is usually considered to be the most valuable, flexible and diverse form of energy of these six likely sources, solar power, wind power and small hydroelectric are most suitable for generating electric power from renewable energy. The following sections provide an evaluation of potential alternative energy sources applicable to this region, and their potential for use at PCWA facilities.

5.1 Solar

Solar photovoltaic (PV), also known as solar cells, transform sunlight directly into electricity. Sunlight is a relatively abundant, clean renewable resource available for energy harnessing. Solar cells utilize semiconductors to create the electrical power when exposed by light. Solar PV systems can be utilized in a variety of ways. Stand-alone systems can be the best choices for applications where utility-generated power is unavailable, unreliable, undesirable or simply too costly to provide electrical services. Grid-connected solar PV systems can assist in supplying some of the electrical power consumed during peak hours. Grid-connected solar also provides the benefit of net metering, described in Section 6.

Passive solar is the technology of non-mechanical solar collection. Passive solar design integrates a combination of building features to reduce or even eliminate the need for mechanical cooling and heating and daytime artificial lighting. Building heating and natural lighting can all be accomplished with passive solar heating. Passive solar technologies in the proper application can assist in lowering energy consumption and energy cost. Passive solar is best suited for new construction, due to architectural requirements.

Solar power is the most visible and well-known form of renewable energy. Solar power projects prove to the public that clean renewable electricity is in use, and are rapidly being applied to homes, businesses, industrial facilities and commercial office buildings. At least 25 water agencies and water treatments plants in California and Nevada have recently installed solar power projects. Appendix F provides listing of water agencies and treatment plants with solar power projects.

- **System types:** Solar energy is converted to electricity by photoelectric (PV) panels or by solar thermal power plants. PV projects are much more common, but passive systems are also being explored.
- **Size:** Most commercial and institutional PV systems have been in the 50 kW to 1,000 kW size. Water agencies and WTPs have an average PV size of about 500 to 550 kW.

- **Cost:** Solar PV system have a typical installed cost of \$7,500 to \$10,000 per kW and small grid isolated sites with batteries can cost even more.
- **Site considerations:** Solar systems require a reasonably large land or spatial area for direct exposure to sunlight so that the shading effect of one array does not affect an adjacent array.
- **Capacity factor:** The output of any electric power generation system can be measured and compared by a concept called the capacity factor. The capacity factor is the ratio of the output of a system to its full output capacity over a period of time, indicating how much of the facility's energy generating capacity is in use over time. Typical solar power projects have a capacity factor of 0.14 to 0.21, and this value is among the lowest of all renewable energy technologies.
- **PCWA application:** With a solar isolation exceeding 5.5 kilowatt hours per square meter PCWA is a candidate for added solar power generation. PCWA has already installed some solar PV, and has several sites ready for PV installation.

5.2 Wind

Wind power is captured by utilizing wind turbines. The power of the wind has been harnessed for centuries, from windmills pumping water, grinding grain and generating small amounts of electricity. Wind power is considered a clean, renewable energy technology that is becoming ever more popular to utility customer. When the wind blows the turbine blades rotate that turns a generator that makes high quality, electrical current that is transmitted through the power grid to users. Wind energy is one of the fastest growing energy resources in the world and the recent growth of wind power in the US was 45% in 2007 (Department of Energy, 2008)

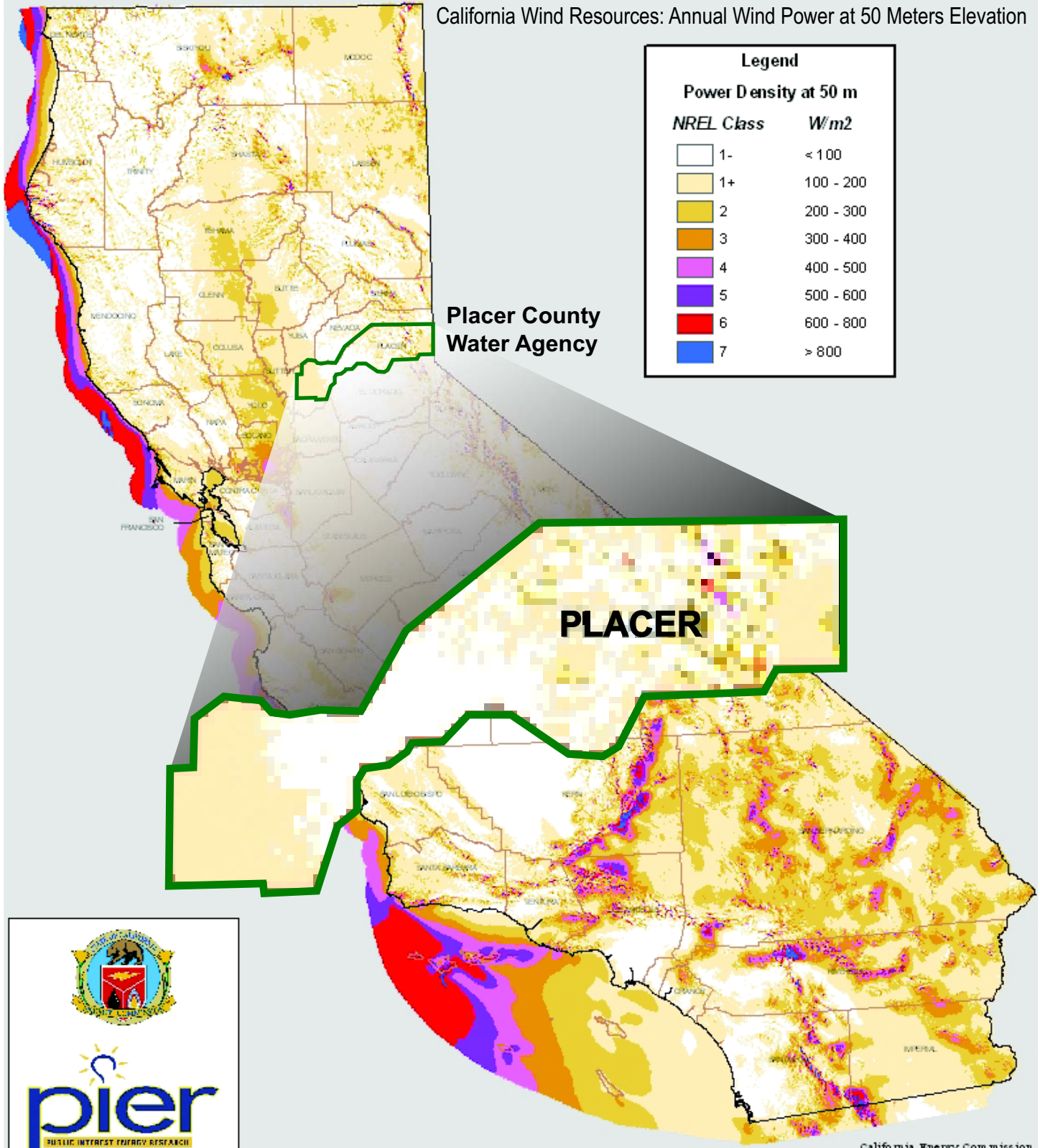
- **System types:** Wind turbines include both horizontal axis and vertical axis turbine. Horizontal axis turbines are clearly the most widely used, particularly in sizes above 250 kW.
- **Size:** Most commercial and institutional wind power turbines have been in the 50 kW to 2500 kW. Single turbine and multiple wind turbine sites are common.
- **Cost:** Wind power system have an installed cost of \$1,800 to \$3,000 per kW. Smaller systems are on the higher end of the range. \$1,500 per kW Self Generation Incentive Program (SGIP) incentives are available if for projects over 30 kW (Department of Energy, 2008).
- **Site considerations:** Wind power systems require a section of clear unobstructed land area to avoid disrupting the flow of wind through the turbine blades.
- **Output:** Typical wind power projects have a capacity factor of 0.28 to 0.40.

PCWA application: Wind power applicability is extremely site specific and dependent on a reliable wind resource. Wind power is classified in one of seven classes per the National Renewable Energy Laboratory (NREL) system. Generally to be economically attractive, wind power projects should be located in NREL Wind Power Class 3 or higher (National Renewable Energy Laboratory, 2008a). Figure 5-1 presents the NREL Wind Resource Map for California.

The PCWA service territory is predominantly designated Class 1 or 2, which is marginally suitable for wind power. To use wind power, PCWA may have to use a wind turbine specifically designed for lower wind speeds or locate a wind turbine in a high elevation portion of Placer County, where winds are Class 3 or above.

California Wind Resources: Annual Wind Power at 50 Meters Elevation

Legend	
Power Density at 50 m	
NREL Class	W/m ²
1-	< 100
1+	100 - 200
2	200 - 300
3	300 - 400
4	400 - 500
5	500 - 600
6	600 - 800
7	> 800



Placer County Water Agency

PLACER



This map was created by AWS TrueWind Solutions using the Mesomap system and historical weather data. Although it is believed to represent an accurate overall picture of the wind energy resource, estimates at any location should be confirmed by measurement. Data current 2006

T:\Pracer\CD\Wind Speed\Wind Maps\2006\A\Map\PLR\WE\WindPower_50m_A.sxd.mxd

California Energy Commission
Facilities Siting Division
Cartography Unit
www.energy.ca.gov

To inquire about ordering this map or information on other types of maps call the map line at (916) 654-4162 or E-Mail: JGILBRE@ENERGY.STATE.CA.US

P:\340001\34903 - PCWA Benchmark Study\Project Documents\graphics

	PROJECT 134903-008	SITE PCWA Benchmark Study Placer County, California	Figure 5-1
	DATE 8-14-08	TITLE Wind Resources Map	

5.3 Biomass

Biomass is a renewable energy source because the energy contained from organic material is exploited into power and fuel energy. Biomass sources consist of plant materials and animal products. Biomass fuels include wood and paper products, residues from food production and processing, waste tires, trees and grasses, and landfill waste.

There are 31 wood-waste power plants in California of which 20 are still operating and 11 are currently in idle status as of 2008. More plants are under consideration or being built in strategic areas. Waste to energy projects have large environment constraints and are capital intensive. None of the 20 wood waste power plants are economically healthy. They require extensive land area, along with a consistent and reliable source of fuel. Transportation cost for biomass fuels increase dramatically as the distance of fuel transportation to the plant increases. These high diesel fuel cost are the reason for most idle plants.

Some of the benefits of a local watershed located biomass project that are not typically quantified include the reduction in wild fires and the improvement in water quality. Biomass is unlikely to be a cost effective energy generation option for PCWA unless funding partners participate to make a project cost effective from PCWA's perspective.

5.4 Hydropower

Hydroelectric energy is a renewable energy source that can be implemented on a small scale to take advantage of existing energy that is often lost in the operation of water systems. PCWA has multiple sites that are candidates for small hydro power, as discussed in the following sections.

Hydropower is typically categorized by the size of the generating facility, as described in Table 5-1.

Large- hydro	More than 100 MW and usually feeding into a large electricity grid
Medium-hydro	15 - 100 MW - usually feeding a grid
Small-hydro	1 - 15 MW - usually feeding into a grid
Mini-hydro	Above 100 kW, but below 1 MW; either stand alone schemes or more often feeding into the grid
Micro-hydro	From 5kW up to 100 kW; usually provided power for a small community or rural industry in remote areas away from the grid.
Pico-hydro	From a few hundred watts up to 5kW

Because of the familiar technology involved, small hydroelectric power projects are particularly well suited for water agencies. The hydropower opportunities for PCWA are of the micro-hydro to mini-hydro size. Some of the key characteristics of these sized facilities are as described below.

- System types:** Small hydropower projects are built with Francis type turbines, Pelton wheels, Kaplan turbine, or Archimedes screw type turbines in the very low head applications.

- **Cost:** Small hydroelectric power system costs vary extensively. They often have a typical installed cost of \$3,000 to \$10,000 per kW and average unit cost is very site-specific.
- **Site considerations:** Small hydropower systems are extremely site-specific and require a continuous or near continuous source of water, along with excess head or water pressure, and a nearby connection to the electric power grid.
- **Output:** Typical small hydropower projects have a capacity factor of 0.30 to 0.80.

Hydropower opportunities for PCWA include energy recovery in the canal system and from pressure reducing valves (PRVs) in water distribution pipelines. Capturing energy from pipelines is known as in-conduit hydro.

Canal Hydropower. PCWA has investigated the potential of hydroelectric installations on its canal system in the past. A 1984 study investigated five sites, with all of the sites showing potential. A 1985 study looked at 15 sites, including three sites previously investigated. Another 1985 study examined a site located south of Auburn near the Foothill WTP. No hydropower facilities were constructed as a result of these investigations. A brief 2002 evaluation developed some preliminary cost estimates for four of the sites previously investigated. PCWA concluded in 2002, that the payback period for these hydropower projects varied from 12 to 34 years and that these projects should be reevaluated if the price of energy changes substantially. In 2008, PCWA identified six other sites along the canal system that might have good hydropower potential.

For this report, the past hydropower evaluations were reviewed, the results for the same sites compared, and the costs indexed to current costs. The costs were escalated to a 2010 level to provide a cost number that would be realistic for any of these projects being considered at this time. No site specific evaluations and quantity take-offs were done at this level of evaluation. Only very approximate costs based on maximum flow rate only are presented for the new sites identified in 2008. The intent of this current evaluation is to see if any of the previously identified power opportunities make sense to investigate further in Phase 2 of this energy project.

Table 5-2 presents a summary of the potential sites. The table presents the facility sizes and cost estimates that were developed for each of the sites by the previous evaluations. The locations of many of the sites are depicted in Figure 5-2. An initial cost screening of the sites results in 5 of the sites being most economically favorable. However, all of the sites should be further evaluated to verify their economics before final site selection decisions are made. These 5 sites have potential hydropower capacities that range from 87 to 182 kW. Many of the sites include the costs of replacing existing pipe. The costs of pipe replacement for the Gold Run, Hayford, and Secret Town sites are excluded because these sites have recently had or soon will have the pipelines replaced as part of overall canal improvements being done by PCWA. The other listed projects do include the costs of pipe replacements. Replacing pipelines as part of these energy projects provides the additional benefit of upgrading the canal system.

As can be seen in Table 5-2, the 5 best canal hydropower sites would have a total capital cost of approximately \$2 million, and would generate almost 3 million kWh per year. Annual revenue at \$0.11 per kWh would be \$0.3 million. This list of potential canal hydropower sites is not complete. There are very likely other sites that have not yet been identified and evaluated. It is possible that some of the identified individual hydropower sites could be consolidated to allow for greater cost effectiveness.

Table 5-2. Canal Hydropower

No.	Name	Flow, maximum, cfs	Effective Head, ft.	Power Capacity, KW	Annual Power, KWH	Capital Cost	Cost per KW Capacity	Cost/KWH, 6%, 30 yrs.	Annual Revenue at \$0.11/KWH	Simple Payback, yrs.	Remarks	Source
1	Antelope Drop	15									"Grand Canyon of the Antelope", upstream of where Antelope drops upstream of Clover Valley Reservoir. See Bickford Ranch plans for piping around Clover Valley Reservoir.	5, 6
2	Cape Horn Random	25	32	38	219,400	\$ 425,163	\$ 11,188	\$ 0.14	\$ 24,134	17.6		3
2b	Cape Horn Settler Random	25	35	42	242,508						New site, 35' drop, about 150' in length	8
3	Cape Horn Shoot Pipe	25		125	650,000	\$ 714,254	\$ 5,714	\$ 0.08	\$ 71,500	10.0	Flow too high.	2
		25	59	91	433,100	\$ 485,774	\$ 5,338	\$ 0.08	\$ 47,641	10.2		3
4	Colfax Header Box Pipe											
5	Crows Flat Flume	20			-						Drop just upstream of the flume. Pipe once sized for this stretch, including converting the flume to a siphon	5, 6
6	Gold Run	28	62	98	510,900	\$ 415,872	\$ 4,244	\$ 0.06	\$ 56,199	7.4	Does not include cost of pipeline. Head based on 2,000 ft. alternative.	3
		24	62	94	502,600	\$ 440,496	\$ 4,686	\$ 0.06	\$ 55,286	8.0	Does not include cost of pipeline. Used for total. Likely candidate. Replacement of over two thirds of pipe by end of 2008.	4
			146								Head might be 146 ft.	6
			140								11,300 ft. of pipe.	7
9	Hayford Pipe	22	86	112	495,800	\$ 350,982	\$ 3,134	\$ 0.05	\$ 54,538	6.4	Does not include cost of pipeline.	3
		16	86	87	404,600	\$ 385,434	\$ 4,430	\$ 0.07	\$ 44,506	8.7	Does not include cost of pipeline. Replacement of a third of siphon by end of 2008.	4
10	Heather Glen Spill	20		125	710,000	\$ 1,091,758	\$ 8,734	\$ 0.11	\$ 78,100	14.0		2
		17	104	102	543,600	\$ 624,029	\$ 6,118	\$ 0.08	\$ 59,796	10.4	Includes cost of pipe.	3
		16	104	113	526,000	\$ 389,105	\$ 3,443	\$ 0.05	\$ 57,860	6.7	Does not include cost of pipeline.	4
11	Kilmer Pipe	24	20	25	109,500	\$ 527,140	\$ 21,086	\$ 0.35	\$ 12,045	43.8		3
12	Lake Alta	28	49	72	390,800	\$ 631,108	\$ 8,765	\$ 0.12	\$ 42,988	14.7		3
13	Lake Theodore Lower Random	9.5	96	59	290,500	\$ 733,748	\$ 12,436	\$ 0.18	\$ 31,955	23.0		3
14	Lake Theodore Upper Random	9.5	54	29	135,000	\$ 342,209	\$ 11,800	\$ 0.18	\$ 14,850	23.0		3
15	Long Ravine Pipe	24		150	760,000	\$ 722,834	\$ 4,819	\$ 0.07	\$ 83,600	8.6	Includes cost of pipe.	2
		25	94	130	614,000	\$ 455,468	\$ 3,504	\$ 0.05	\$ 67,540	6.7	Includes cost of pipe.	3
		20	84	114	563,300	\$ 409,294	\$ 3,590	\$ 0.05	\$ 61,963	6.6	Does not include cost of pipeline.	4
16	Lower Banvard Siphon	9			-						Starts at Granada spill	5, 6
16b	New, Lower, Lower Banvard Site	9	50	25	127,500						50' head estimated through rough estimate	8
17	Mammoth Reservoir Random	20			-						Drop in the Boardman Canal downstream of the reservoir.	5, 6
18	Marshall Siphon	60			-						Replaced about 13 years ago.	5, 6
19	McCrary Reservoir on Boardman	40	279	660	3,317,000	\$ 3,899,419	\$ 5,908	\$ 0.09	\$ 364,870	10.7	Canal has been modified. Flows may be less.	1
20	Monte Vista	27		150	820,000	\$ 836,514	\$ 5,577	\$ 0.07	\$ 90,200	9.3	Flow too high.	2
		28	71	83	534,900	\$ 570,718	\$ 6,876	\$ 0.08	\$ 58,839	9.7		3
21	Red Ravine on Boardman	36			-						Boardman canal from just below YB78 to the head of the Red Ravine on Foothill's property. Backing up water to get head may adversely affect the ability for Foothill to overflow into the Boardman.	5, 6
22	Schroeder Gap Random	25	33	39	223,800	\$ 373,842	\$ 9,586	\$ 0.12	\$ 24,618	15.2		3

Table 5-2. Canal Hydropower (continued)

No.	Name	Flow, maximum, cfs	Effective Head, ft.	Power Capacity, KW	Annual Power, KWH	Capital Cost	Cost per KW Capacity	Cost/KWH, 6%, 30 yrs.	Annual Revenue at \$0.11/KWH	Simple Payback, yrs.	Remarks	Source
23	Secret Town Pipe	26		200	1,150,000	\$ 718,544	\$ 3,593	\$ 0.05	\$ 126,500	5.7	Does not include cost of pipeline. Flow high. Half pipe replaced, with rest by 2010.	2
		27	114	182	818,300	\$ 521,769	\$ 2,867	\$ 0.05	\$ 90,013	5.8	Does not include cost of pipeline.	3
			185								Head with Phase 1 and 2 of pipe may be more than 185 ft.	6
			170								Over 3,185 feet of 36" pipe. More pipe than early references.	7
24	Secret Town Upper Random	27	30	46	534,900	\$ 415,429	\$ 9,031	\$ 0.06	\$ 58,839	7.1		3
											The Shoot Flume is located about 650 feet upstream of the inlet to the Secret Town Pipe (Old Highway Spill) . Extending pipe to the upstream end of the flume would gain 30 ft.	7
25	Secret Town Lower	27	20								Siphon drop 600 ft. downstream of the outlet of the Secret Town Siphon, upstream of Magra Flume. Same flows as Secret Town.	6, 7
26	6' Vertical drop on Boardman Canal/Lake Arthur Road	40	6	12	61,200						6' of vertical drop, same flow as Boardman in this area	8
27	Mammoth Reservoir Outlet Pipe		15								Between 15-20 feet of head	8
28	Clover Valley Reservoir Outlet Pipe		30								Head approximately estimated	8
29	Boardman by Dutra Property, Powerhouse Road, below YB 78										To be piped within 5 years, flow of YB 78	8
	Total (bold sites only)			606	2,865,500	\$ 2,192,272	\$ 3,618	\$ 0.06	\$ 315,205	7.0		

¹ Initial Boardman Canal Evaluation, Boyle Engineering, Dec. 1985.

² Report on the Acquisition and Hydroelectric Development of the Upper Placer Water System for the Placer County Water Agency. RW Beck, Jan. 1984.

³ Feasibility Study for Hydro Generation. Borcalli, Ensign, and Buckley, 1985.

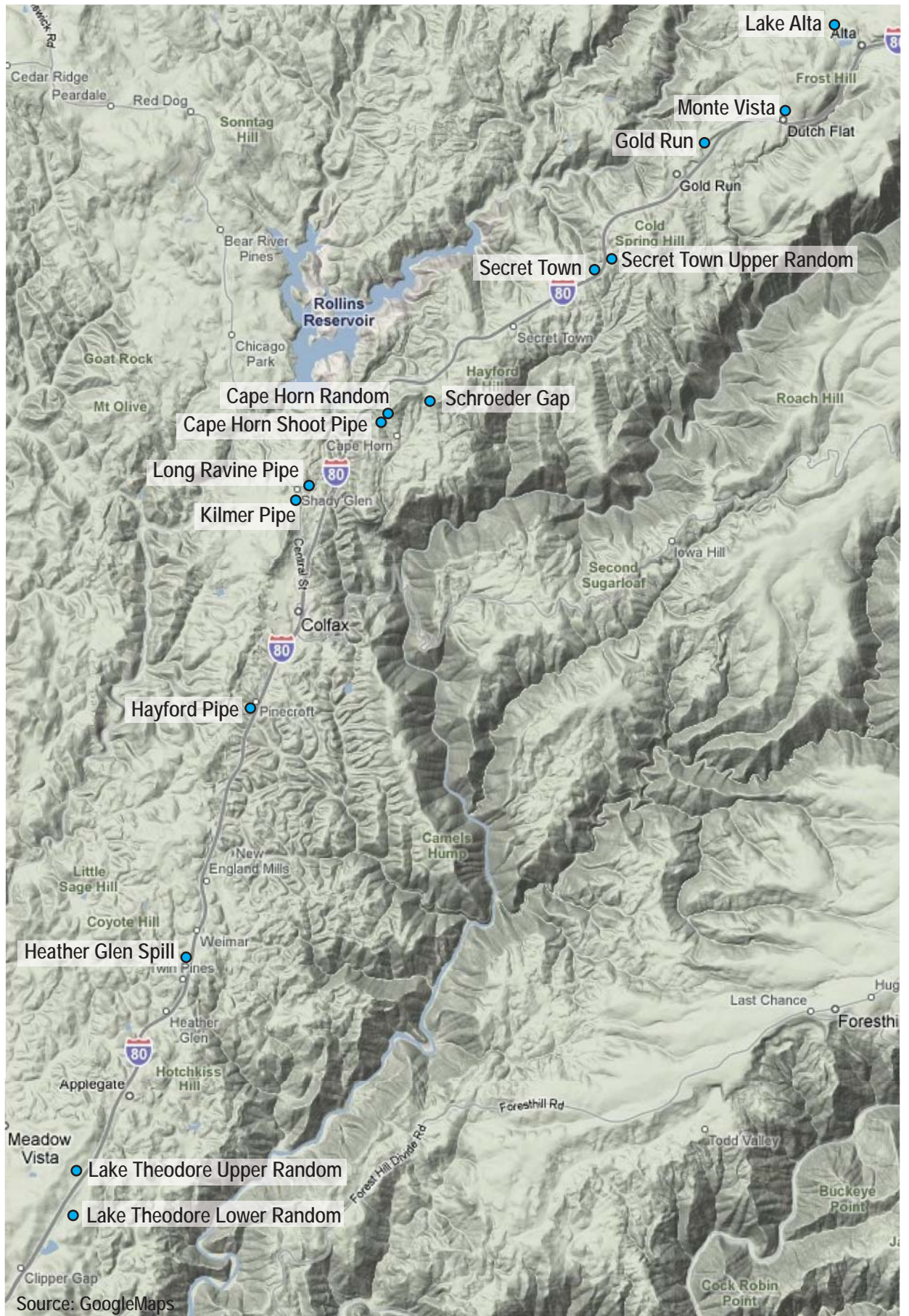
⁴ Feasibility Study for Zone 3 Canal Upgrades and Potential Hydroelectric Installations. Psomas. April 2002.

⁵ Email from Mike Nichol to Dave Breninger, October 19, 2007.

⁶ Email from Mike Nichol, Aug. 19, 2008.

⁷ Email from Ken Powers, Aug. 20, 2008.

⁸ Email from Mike Nichol, May 7, 2009.



Source: GoogleMaps

BROWN AND CALDWELL	PROJECT 134903-008	SITE PCWA Energy Benchmark Study Placer County, California	Figure 5-2
	DATE 10-7-08	TITLE Potential Zone 3 Canal Hydropower Locations	

PRV Hydropower. PCWA's treated water distribution system has a number of PRVs. Some of these PRVs have flow and headloss characteristics that make them good candidates for hydropower. Table 5-3 presents a list of the PRVs within the PCWA system in descending order of annual power output. The best PRV sites to investigate further are the Lincoln Metering Station, the Sunset 10 MG tank altitude valves, and the Whitney Ranch pressure reducing station (PRS). The Sunset 840 and Park Drive pressure reducing stations and the Penryn altitude station also appear promising.

Selling Power to the Grid. A key aspect of evaluating hydropower potential is identifying the revenue that would be generated by selling power to PG&E. Net metering and feed-in tariffs are alternative programs for selling power generated by alternative energy, which are described in Section 6. Feed-in tariffs may be the best opportunity to pursue. The details of selling power should be further investigated in future phases.

Table 5-3. PRV Stations and Potential Electricity Generation

Pressure Relief Station	Flowrate Range (gpm)		Ave Flowrate (gpm)	High Pressure, psi	Low Pressure, psi	Pressure, psi	Power Capacity, KW	Annual Power, KWH	Annual Revenue @ \$0.11/KWH
Lincoln Metering Station	2,400	10,000	5,000	115	10	105	329	1,440,959	\$158,506
Sunset 10 MG ALT STA, Valve 1	0	7,000	3,500	105	20	85	186	816,544	\$89,820
Sunset 10 MG ALT STA, Valve 2	0	2,000	1,000	105	20	85	53	233,298	\$25,663
Sunset 10 MG ALT STA, Valve 3	0	7,000	3,500	105	20	85	186	816,544	\$89,820
Sunset 840 PRS	0	10,000	5,000	120	75	45	141	617,554	\$67,931
Penryn ALT STA	200	4,500	2,350	100	10	90	127	580,501	\$63,855
Park Drive PRS #1	0	4,000	2,000	158	55	103	129	565,405	\$62,195
Whitney Ranch PRS, Valve 1	0	4,500	2,000	150	50	100	141	548,937	\$60,383
Whitney Ranch PRS, Valve 2	0	4,500	2,000	150	50	100	141	548,937	\$60,383
Crest Drive PRS	200	4,000	2,100	102	38	64	80	368,886	\$40,577
Colwell Road PRS	200	2,000	1,100	165	55	110	69	332,107	\$36,532
Horseshoe Bar Road PRS	200	2,000	1,100	161	75	86	54	259,647	\$28,561
Taylor Road PS	0	2,000	1,000	142	54	88	55	241,532	\$26,569
Sunset 2.5 MG ALT STA	0	3,000	1,500	55	10	45	42	185,266	\$20,379
Granite Drive PRS	0	1,500	750	137	49	88	41	181,149	\$19,926
Sunset Blvd PRS & PRV	0	3,000	1,500	110	71	39	37	160,564	\$17,662
Bell Road PRS	200	3,000	1,600	70	35	35	33	153,702	\$16,907
Nevada Street PRS	0	1,500	750	125	61	64	30	131,745	\$14,492
Val Verde PRS	0	1,000	500	155	71	84	26	115,277	\$12,680
Foothill Pump PRV STA	0	700	350	117	0	117	26	112,395	\$12,363
Auburn Ravine PRS	200	1,000	600	120	54	66	21	108,689	\$11,956
Clover Valley PRS	200	1,000	600	112	48	64	20	105,396	\$11,594
Stanford Ranch Tank ALT STA	0	1,500	750	58	15	43	20	88,516	\$9,737
Glenview Road PRS	0	500	250	150	30	120	19	82,341	\$9,057
Stoneridge Pump Station	0	500	250	128	8	120	19	82,341	\$9,057
Vintage Oaks ALT STA	0	500	250	120	10	110	17	75,479	\$8,303
Pebble Beach Road PRS	0	500	250	145	45	100	16	68,617	\$7,548
Vintage Oaks PRS	0	500	250	160	75	85	13	58,325	\$6,416
Southside Ranch Road PRS	0	500	250	128	54	74	12	50,777	\$5,585

Table 5-3. PRV Stations and Potential Electricity Generation (continued)

Pressure Relief Station	Flowrate Range (gpm)		Ave Flowrate (gpm)	High Pressure, psi	Low Pressure, psi	Pressure, psi	Power Capacity, KW	Annual Power, KWH	Annual Revenue @ \$0.11/KWH
Rock Creek PRS	0	500	250	116	45	71	11	48,718	\$5,359
Mill Pond Road PRS	0	1,000	500	75	40	35	11	48,032	\$5,284
Dogwood Road PRS	0	300	150	145	37	108	10	44,464	\$4,891
Nary Red Road PRS/PRV	0	350	175	126	35	91	10	43,709	\$4,808
Swetzer Road PRS @ King Road	0	500	250	102	58	44	7	30,192	\$3,321
Auburn Folsom Road PRS	0	500	250	157	114	43	7	29,505	\$3,246
South Auburn Street PRS	0	200	100	162	55	107	7	29,368	\$3,230
King Road PRS	0	500	250	101	59	42	7	28,819	\$3,170
Los Lagos PRS (pumps from San Juan WD)	0	500	250	98	56	42	7	28,819	\$3,170
Ketchican Drive PRS	0	200	100	148	45	103	6	28,270	\$3,110
Bridlewood Drive	0	200	100	160	60	100	6	27,447	\$3,019
Rising Sun Road PRS	0	500	250	65	25	40	6	27,447	\$3,019
Telegraph Hill	0	200	100	150	60	90	6	24,702	\$2,717
Hoyer Lane PRS/PRV	0	200	100	115	38	77	5	21,134	\$2,325
Lincoln Way PRS	0	500	250	117	87	30	5	20,585	\$2,264
Park Drive PRS #2	0	500	250	85	55	30	5	20,585	\$2,264
Hillcrest Drive PRS	0	200	100	134	60	74	5	20,311	\$2,234
Towle Hill Road PRS	0	200	100	77	7	70	4	19,213	\$2,113
Skyridge ALT STA	0	450	225	34	10	24	3	14,821	\$1,630
Oak Lane PRS	0	200	100	79	30	49	3	13,449	\$1,479
Canyon Way PRS	0	100	50	133	42	91	3	12,488	\$1,374
Great Divide Way PRS	0	200	100	115	75	40	3	10,979	\$1,208
Arnold Drive	0	200	100	120	85	35	2	9,606	\$1,057
Chantry Hill PRS	0	300	150	80	60	20	2	8,234	\$906
Huntley Avenue PRS	0	200	100	70	40	30	2	8,234	\$906
Dairy Road PRS/PRV	0	150	75	125	90	35	2	7,205	\$793
Blackwood Drive PRS	0	150	75	140	110	30	1	6,176	\$679
Shockley Road PRS	0	200	100	84	62	22	1	6,038	\$664
Circle Drive #2 PRS	0	100	50	120	78	42	1	5,764	\$634
Penryn PRS	0	200	100	76	55	21	1	5,764	\$634
Circle Drive #1 PRS	0	100	50	125	88	37	1	5,078	\$559
Grandview Road PRS	0	100	50	120	88	32	1	4,391	\$483
Total								9,794,543	\$1,077,400

5.5 Geothermal and Water Source Heat Pumps

A handful of geothermal energy resources in California are producing clean renewable electricity and geothermal power plants are some of the oldest, most reliable, and most successful forms of alternative energy in California. Traditional or high-temperature geothermal electric power is exceptionally site specific and highly localized, and probably does not apply to PCWA.

Geothermal technology also includes low-temperature geothermal heat pumps. Heat pumps are mechanical refrigeration devices that provide heat energy, not electricity. Water source heat pumps are a proven well established technology and an exceptionally efficient method of producing heat energy for building space heating and domestic hot water. In addition they supply heat with a much smaller carbon output than natural gas, the traditional lowest cost fuel for making heat from fuel.

5.6 Conclusions

Of the available technologies, solar photovoltaic and small hydroelectric electricity generation are the most promising technologies for application by PCWA. PCWA should consider further evaluation of solar photovoltaic and small hydroelectric electricity generation.

It is recommended that further analysis of small hydroelectric locations be conducted. Further analysis should consider other potential hydroelectric sites, permitting requirements, identification of the rates paid by PG&E for electricity, and the cost-benefit analysis of the cost of construction versus the generation and sale of power to determine the payback period.

PCWA should consider additional solar photovoltaic facilities. Additional study to identify the appropriate amount of solar electricity to generate and identification of the long term goal of renewable power should be conducted.

6. COST SAVING AND FUNDING OPPORTUNITIES

This section describes funding opportunities available to PCWA to help address energy and GHG mitigation projects. Funding programs available from PG&E and other sources as well as partnership opportunities are discussed.

6.1 Pacific Gas and Electric Company Energy Funding Opportunities

PG&E offers a variety of residential and non-residential rebate programs and incentives. Below is a summary of the non-residential programs that are offered by PG&E that are applicable to PCWA.

6.1.1 Water Treatment Program Energy Audits, Rebates, Incentives, and Design Assistance

PG&E offers an energy audit or analysis to assist customers develop a comprehensive energy management plan. As a business participating in PG&E's Water Treatment Program, PCWA is eligible for on-site and integrated audits/analysis.

PG&E also has cash rebates and incentives available for energy efficient technologies for water treatment facilities, whether PCWA is replacing existing equipment with new energy efficient technologies or purchasing new equipment. Some examples of equipment qualifying for rebates include premium T-8 and T-5 lighting, occupancy sensors, day lighting controls, and premium efficient motors and pumps. Additionally, cash incentives and design assistance are available for new buildings and system processes such as low pressure ultraviolet (UV) disinfection systems or fine bubble aeration.

6.1.2 Standard Energy Efficiency Rebate Program

The Standard Energy Efficiency Rebate Program covers a variety of specified energy efficient equipment purchases, including:

- Agricultural Improvements
- Appliances and General Improvements
- Boilers and Water Heaters
- Business Computing
- Food Service Improvements
- Heating, Ventilation, and Air Conditioning Improvements
- Lighting
- Refrigeration

Equipment is eligible if it was purchased between January 1, 2006 and December 31, 2008 and proof of purchase must be received by PG&E within 90 days of purchase to receive the rebate.

6.1.3 Customized Energy Efficiency Improvement Rebate Program

The Customized Energy Efficiency Improvement Rebate Program offers incentives for retrofit improvements that are not covered under the standard energy efficiency rebate program. After a project proposal is reviewed and approved by PG&E, funding is appropriated in order for the project to be implemented. Some examples of measures that may be eligible for customized incentives include:

- Air Compressor
- Adjustable Speed Drive: Heating Ventilation and Air Conditioning
- Efficient Boilers
- Efficient Chillers
- Efficient Computer Equipment
- Efficient Fans
- Efficient Lighting
- Efficient Motors
- Efficient Pool Heaters
- Reflective Window Film
- Vending Machine Controller
- Virtualization

Total incentive payments are based on actual reduction in energy usage. Customers and/or their consultants may sponsor projects under this approach. PG&E should be contacted early in the process and before the project is started so that PG&E can help identify the appropriate application forms, confirm a project's eligibility, offer advice on the technical aspects of the application, and generally assist with the process.

6.1.4 Non-Residential New Construction

Non-Residential New Construction (NRNC), also known statewide as Savings by Design is a program for commercial, industrial, high tech, and agricultural customers that encourage energy-efficient building and process design and construction. The program, administered by PG&E under the auspices of the California Public Utilities Commission (CPUC), offers owners and their design teams a variety of services and follows the protocol outlined in the NRNC/Savings by Design program material.

This program offers analysis and resources to aid owners and design teams with energy-efficient facility design, including:

- **Technical design assistance** to analyze and design more energy-efficient buildings and process systems.
- **Owner incentives** of up to \$500,000 per project to help offset the investment in energy-efficient building and design, subject to project incremental costs.
- **Design team incentives** of up to \$50,000 per project to reward designers who meet ambitious energy-efficiency goals.

NRNC targets the primary decision makers in new construction and renovation/remodel projects: building owners, architects, engineers, designers, contractors, builders, developers, and energy consultants. NRNC analyses provide detailed technical and financial assistance data that allows owners and design teams to make informed decisions regarding energy efficiency features. The NRNC offerings serve commercial, industrial, and agricultural customers and utilize the 2005 California State Building Energy Efficiency Standards (Title 24, Part 6) as a reference baseline for comparison. The offering requires projects to perform generally 10

percent (10%) better than mandated by Title 24. Other industry standards may be used where appropriate to determine reference baselines for comparisons.

6.1.5 Net Metering and Feed-In Tariffs

This section describes requirements regarding net metering and feed-in tariffs

6.1.5.1 California Net Metering

California's net-metering law, which took effect in 1996, requires utilities to offer net metering to all customers for solar and wind-energy systems up to 1 MW. Investor owned utilities are required to offer net metering for biogas-electric systems and fuel cells. This law provides a system to allow for better compensation from PG&E for electricity generated by the customer using alternative energy sources.

The original law applied to wind-energy systems, solar-electric systems, and hybrid (wind/solar) systems. In September 2002, legislation (AB 2228) allowed biogas-electric facilities up to 1 MW to net meter until December 31, 2005, under a pilot program. This pilot program was extended until December 31, 2009.

Net excess generation (NEG) is carried forward to a customer's next bill for up to 12 months. Any NEG remaining at the end of each 12-month period is granted to the customer's utility. Publicly owned utilities may elect to provide co-energy metering, which is the same as net-metering, but incorporates a time-of-use rate schedule. Customer-generators with systems sized between 10 kW and 1 MW who are subject to time-of-use rates are entitled to deliver electricity back to the system for the same time-of-use (including real-time) price that they pay for power purchases. However, time-of-use customers who choose to co-energy meter must pay for the metering equipment capable of making such measurements. Customer-generators retain ownership of all renewable-energy credits (RECs) associated with the generation of electricity.

6.1.5.2 Feed-In Tariffs

Assembly Bill (AB) 1969 (Yee, 2006) added Public Utilities Code Section 399.20, authorizing tariffs and standard contracts for the purchase of eligible renewable generation up to 1.5 MW in size from public water and wastewater facilities. Eligible renewable technologies include solar, wind, geothermal, biogas, small hydro, and fuel cells that use renewable fuels. The PG&E tariff averages \$0.11/kWh.

6.2 Non-PG&E Energy Funding Opportunities

This section identifies grant funding and rebate sources outside of PG&E at the federal, state, and local level. It is important to note that funding availability from one program for PCWA may be impacted if PCWA is receiving funding from other programs.

6.2.1 Federal Level

This section describes the applicable energy policy and funding programs available at the Federal level.

6.2.1.1 Energy Independence and Security Act of 2007

The Energy Independence and Security Act is an energy policy law that consists mainly of provisions designed to increase energy efficiency and the availability of renewable energy. This program is implemented by the Department of Energy (DOE). The four main components of the Energy Independence and Security Act are:

- **Corporate Average Fuel Economy (CAFE).** The law sets a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020.

- **Renewable Fuels Standard (RFS).** The law sets a modified standard that starts at 9.0 billion gallons in 2008 and rises to 36 billion gallons by 2022.
- **Energy Efficiency Equipment Standards.** The adopted bill includes a variety of new standards for lighting and for residential and commercial appliance equipment.
- **Repeal of Oil and Gas Tax Incentives.** The enacted law includes repeal of two tax subsidies in order to offset the estimated cost to implement the CAFE provision.

6.2.1.2 Federal Loan Program - Clean Renewable Energy Bonds

The federal Energy Tax Incentive Act of 2005, under Title XIII of the federal Energy Policy Act of 2005, established Clean Energy Renewable Bonds (CREBs) as a financing mechanism for public sector renewable energy projects.

CREBs are issued with a 0% interest rate. The borrower pays back only the principal of the bond, and the bondholder receives federal tax credits in lieu of the traditional bond interest. Tax credit funds are allocated by the U.S. Treasury Department. The tax credit rate is set daily by the U.S. Treasury Department and may be taken quarterly on a dollar-for-dollar basis to offset the tax liability of the bondholder.

CREBs differ from traditional tax-exempt bonds in that the tax credits issued through CREBs are treated as taxable income for the bondholder. The tax credit may be taken each year the bondholder has a tax liability as long as the credit amount does not exceed the limits established by Energy Policy Act of 2005.

6.2.1.3 Federal Corporate Tax Credit

The federal Energy Policy Act of 2005 expanded the federal business energy tax credit for solar and geothermal energy properties to include fuel cells and microturbines installed in 2006 and 2007, and to hybrid solar lighting systems installed on or after January 1, 2006. To qualify, the original use of the equipment must begin with the taxpayer or it must be constructed by the taxpayer. PCWA could benefit from this tax credit program if a third-party buys the photovoltaic system and receives the tax credit, while the municipal agency typically receives approximately eight percent in savings, and after ten to 20 years takes over ownership of the photovoltaic facility. For eligible equipment installed from January 1, 2006, through December 31, 2008, the credit is set at 30% of expenditures for solar technologies, fuel cells, and solar hybrid lighting. Microturbines are eligible for a 10% credit during this two-year period. For equipment installed on or after January 1, 2009, the tax credit for solar energy property and solar hybrid lighting reverts to 10% and expires for fuel cells and microturbines.

The maximum microturbine credit is \$200 per kW of capacity. No maximum is specified for the other technologies. Solar energy property includes equipment that uses solar energy to generate electricity, to heat or cool (or provide hot water for use in) a structure, or to provide solar process heat. Hybrid solar lighting systems are those that use solar energy to illuminate the inside of a structure using fiber-optic distributed sunlight.

6.2.2 State Level

This section describes the energy policy and funding programs available at the State level.

6.2.2.1 California Renewables Portfolio Standard

California's Renewables Portfolio Standard (RPS) program requires retail sellers of electricity to increase their sales of eligible renewable-energy resources by at least 1 percent of retail sales per year, so that 20% of their retail sales are served with eligible renewable energy resources by 2010. Governor Schwarzenegger has set a

longer-term state goal of 33% by 2020, and currently the CPUC and the California Energy Commission are considering ways to achieve that goal.

6.2.2.2 Renewable Energy Funding Program

The California Energy Commission manages the public benefits funds for renewable energy that consist of the renewable energy, energy efficiency, and research, development, and demonstration funds. The renewable energy fund has three programs:

- Existing Renewable Facilities Program - 20% (\$14.40 million/year)
- Emerging Renewables Program - 79% (\$56.88 million/year)
- Consumer Education Program - 1% (\$720,000/year)

All Existing Renewable Facilities Program funds are available for eligible existing solid-fuel biomass facilities and solar thermal electric facilities.

The Emerging Renewables Program is administered through a rebate program. This program is discussed in detail later in this section. After January 1, 2007, only small wind and fuel cells using renewable fuels are eligible.

The Consumer Education Program provides funds to promote renewable energy and help build the market for emerging renewable technologies.

6.2.2.3 Energy Efficiency Programs

Energy efficiency programs are designed to provide a fair distribution of funds among residential and nonresidential customers, while maximizing energy savings. There are special programs overseen by the Low-Income Oversight Board, to provide energy efficiency services specifically for low-income households.

6.2.2.4 California Emerging Renewables Program

The California Energy Commission offers cash incentives to promote the installation of grid-connected small wind and fuel cell renewable energy electric-generating systems through its Emerging Renewables Program. PG&E contributes funds to this program, so as a PG&E customer PCWA would be eligible to participate.

Effective January 1, 2007, funding levels for the Emerging Renewables Program are:

- Small Wind Turbines (up to 50 kW): \$2.50/W for first 7.5 kW and \$1.50/W for increments > 7.5 kW and < 30 kW
- Fuel cells (<30 kW) using renewable fuels: \$3/W for systems less than 30 kW

The renewable energy system must generate electricity to offset the consumer's on-site electrical load, but the expected production may not be more than the historical or expected electrical needs of the consumer.

6.2.2.5 California Self-Generation Incentive Program

Initiated in 2001, the SGIP offers incentives to customers who produce electricity with wind turbines and fuel cells. The incentive payments range from \$1/W - \$4.50/W for renewable energy systems depending on the type of system. PCWA as a retail PG&E customer is eligible for SGIP. PG&E administers the SGIP program in its service territories.

The following technologies and corresponding incentive amounts apply to the SGIP, effective January 1, 2008:

Technologies using renewable fuels:

- Wind turbines (minimum of 30 kW) - \$1.50/W
- Fuel cells (minimum of 30 kW) - \$4.50/W

Technologies using non-renewable fuels:

- Fuel cells - \$2.50/W

The maximum eligible system size is 5 MW, and the incentive payment is capped at 3 MW. Systems greater than 1 MW in size receive reduced incentive rates, summarized as follows:

- 0 to 1 MW capacity – 100% incentive rate
- 1 MW to 2 MW capacity – 50% incentive rate
- 2 MW to 3 MW capacity – 25% incentive rate

For projects that receive other incentives funded by California investor owned utilities (IOU) ratepayers, the SGIP incentive is discounted by the amount of the other incentive. For projects that receive other incentives funded by non-IOU (e.g., a municipal electric utility) rate payers, the SGIP incentive is discounted by 50% of the other incentive.

6.2.2.6 California Solar Initiative

In January 2006, the CPUC adopted the California Solar Initiative (CSI) program to provide more than \$3 billion in incentives for solar-energy projects with the objective of providing 3,000 MW of solar capacity by 2017. The CSI funds photovoltaics projects initially, with other solar technologies included at a later point. The CPUC manages this program for non-residential projects.

CSI incentives in 2007 began at the following levels:

Expected Performance-Based Buydown for Systems under 100 kW

- \$3.25/W AC for government entities and nonprofits, adjusted based on expected performance.

Incentives will be awarded as a one-time, up-front payment based on expected performance, which is calculated using equipment ratings and installation factors such as geographic location, tilt, orientation, and shading.

Performance-Based Incentives for Systems 100 kW and larger

- \$0.50/kWh for first five years for government entities and nonprofits.

Incentives will be paid monthly based on the actual amount of energy produced for a period of five years.

6.2.2.7 Energy Efficiency Financing Program

The California Energy Commission will provide up to \$26 million in loans to schools, hospitals, and local governments for the installation of energy-saving measures or for energy audits and studies. Interest rates are fixed at 3.95% for the term of the loan. The maximum loan amount is \$3 million and there is no minimum loan. Loans must be paid back within 15 years from energy costs savings, or in 2 years for energy audits. Common projects include lighting and equipment upgrades and heating systems, but can also include other energy-saving measures and renewable energy systems.

6.2.2.8 California Supplemental Energy Payments

Per the Renewable Portfolio Standard statute, the above market costs of renewable energy were to be covered by a "Supplemental Energy Payment" fund administered by the Energy Commission. This funding process

was reformed in late 2007 by Senate Bill 1036, and the CPUC and CEC are currently considering the bill's implementation details.

6.2.2.9 Fueling Alternatives

CARB provides rebates for the purchase or lease of new eligible alternative fuel or electric vehicles. This funding is available to eligible vehicle fleet owners.

6.2.3 Local Level

This section describes the funding programs available at the local level.

6.2.3.1 Sierra Nevada Conservancy Strategic Grants

The Laird-Leslie Sierra Nevada Conservancy Act, enacted in 2004 and commencing with PRC Section 33300, established the Sierra Nevada Conservancy (SNC), and Sections 33343 and 33346 set forth the authority for the SNC to award grants of funds in order to carry out the purposes of the Act. California voters passed Proposition 84, the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coast Protection Bond Act of 2006 (the Act) on November 7, 2006, which allocates \$54 million of these funds for the SNC. At this time, grants are limited to rivers, lakes, and streams restoration. Energy reducing projects are most likely not eligible.

6.2.3.2 Roseville Electric

Roseville electric offers residential and business rebates. Business rebates are for lighting, HVAC, and chillers. Customized programs are also available. According to Marty Baily at Roseville Electric, due to the small usage of energy at the PCWA telemetry station within the Roseville Electric service area, it is unlikely that PCWA could obtain a rebate for reducing electricity demand.

6.3 Partnerships

Sometimes implementing energy efficiency and alternative energy project can be more beneficial when done through partnerships with other entities. Potentially beneficial partners could be private enterprises, public utilities, wastewater utilities, state and federal governments, cities, and counties.

As an example, the City of Auburn has a wastewater treatment plant near the planned Ophir water treatment plant was considered for a potential power generation source. However, the Auburn facility does not have the type of treatment that produces methane that could be used to generate electricity. The treatment system consists of bar screening; grit removal; biological treatment in an oxidation ditch and unlined, aerated equalization ponds. Therefore, it does not contain facilities that can produce methane in quantities that could be used to generate power. At this time, no other specific partnership opportunities have been identified.

PG&E and the state and federal government offer financial incentives for energy efficiency and alternative energy. These funding opportunity partnerships offer PCWA the best opportunities and should be investigated further in future phases. The following section provides more details regarding these opportunities.

A possible partnership to investigate in a future phase would be to implement biomass as an alternative energy source could include a variety of entities including the US Forest Service. No other viable partnerships have been identified at this time.

6.4 Summary of Funding Opportunities

A matrix summarizing the funding opportunities described in this section is provided in Table 6-1. It is recommended that PCWA further investigate the following funding opportunities:

1. PG&E Programs. The suite of available PG&E programs that includes audits, assistance, and financial incentives should be considered. The first step would be to initiate a general dialogue with PG&E regarding funding assistance. For selling alternative energy, the feed-in tariff program appears to offer the best approach for PCWA for small hydro.
2. Federal Level. CREBS provide a loan option for financing energy projects.
3. State Level. The following state level programs should be further evaluated for use by PCWA to help fund energy projects:
 - a. Emerging renewables program for wind projects.
 - b. Self-generation incentive program for wind projects.
 - c. CSI rebate program for solar projects.
 - d. CARB's fueling alternatives program for vehicle fleet upgrades.
 - e. Energy efficiency financing program for loans for energy efficiency projects.

Table 6-1. Energy Funding Opportunities

Program	Agency/ Department	Incentive type	Eligible Efficiency or Renewable/Other Technologies:	Total program funds available/program budget	Amount	Funding limit	Terms	Expiration Date	Website	Comments/ Remarks
Energy Policy Act of 2005 - Clean Renewable Energy Bonds (CREBs)	IRS	Federal loan program	Solar thermal electric, photovoltaics, landfill gas, wind, biomass, hydroelectric, geothermal electric, municipal solid waste, small irrigation power	\$1.2 billion		State and local government limited to \$750 million	0% interest rate	12/31/2008		Financing mechanism for public sector renewable energy projects.
Energy Policy Act of 2005 - Business Energy Tax Credit	IRS	Tax credit	Solar water heat, solar space heat, solar thermal electric, solar thermal process heat, photovoltaic, geothermal electric, fuel cells, solar hybrid lighting, direction use geothermal, micro turbines		\$500 per 0.5 kW for fuel cells; \$200 per kW for micro turbines; no maximum specified for other technologies	Geothermal 10% credit, solar, solar hybrid lighting, fuel cells 30% credit until 12/31/08, after 1/1/09 10% credit for geothermal, solar energy property, solar hybrid lighting.	The energy property must be operational in the year in which credit is taken. Any subsidized energy financing/bonds will reduce the basis for calculating the credit.	1/1/06-12/31/08 (fuel cells and micro turbines equipment placed in service date) Solar energy property, solar hybrid lighting, geothermal credit 10% after 1/1/09		Limited to private sector, but PCWA could participate via a third party buyer.
Energy Policy Act of 2005 - Federal Clean Fuel Vehicle Tax Deduction for Hybrid and Alternative Fuel Vehicles	IRS	Tax Credit	Hybrid and alternative fuel vehicles		\$250-\$4,000 per vehicle		The tax credit for hybrid vehicles applies to vehicles purchased or placed in service on or after January 1 2006.	12/31/10	http://www.energy.gov/taxbreaks.htm	There are tax credit limitations due to limit on number of vehicles eligible per manufacturer.
California Solar Initiative	CPUC	State Rebate Program	Photovoltaics (system components must be on the CEC's list of eligible equipment, systems must be grid connected)	\$3.2 billion/10 years	\$3,250/kW AC (expected performance based by-down for systems <100kW) or \$0.50 per kWh for first 5-years (performance based incentives for system >= 100kW)			2006-2016	www.pge.com/solar	Program managed by PG&E, SCE, and San Diego Regional Efficiency Office.
Self Generation Incentive Program	CPUC	State Rebate Program	Wind and fuel cells	PG&E: \$36 million (2008 funding)	Technology using renewable fuels: \$1,500/kW (wind) to \$4,500/kW (fuel cells); Technology using non-renewable fuels: \$2,500/kW (fuel cells)	1,000 kW		1/1/2012	www.pge.com/selfgen	Program managed by PG&E, SCE, and San Diego Regional Efficiency Office. Until recently it included digester gas.

Table 6-1. Energy Funding Opportunities (continued)

Program	Agency/ Department	Incentive type	Eligible Efficiency or Renewable/Other Technologies:	Total program funds available/program budget	Amount	Funding limit	Terms	Expiration Date	Website	Comments/ Remarks
Public Benefits Funds Account for Renewables and Efficiency - Emerging Renewables Program	CA Energy Commission	State Rebate Program	Wind, Fuel Cells using renewable fuels (System size must be <30 kW; Wind systems up to 50 kW may participate, but rebated is limited to <30 kW; All major system components must be new and approved by the CEC; must carry a minimum 5-yr warranty on all equipment. All systems must be installed with a performance meter.)	\$56.88 million/yr	Small wind turbines (up to 50kW): \$2,500/kW up to 7.5kW, \$1,500/kW for 7.5kW to 30kW; Fuel cells (<30kW): \$3,000/kW				http://www.energy.ca.gov/2006publications/CEC-300-2006-001/CEC-300-2006-001-ED8F.PDF	
Energy Efficiency Financing Program	CA Energy Commission	State loan program	Lighting, Lighting Controls/Sensors, Chillers, Furnaces, Boilers, Heat pumps, Air conditioners, Energy Mgmt. Systems/Building Controls, Building Insulation, Motors, Custom/Others pending approval, CHP/Cogeneration	\$26 million	\$3 million	Up to 100% of energy efficiency project costs	3.95% fixed APR; maximum loan term of 15 years		http://www.energy.ca.gov/efficiency/financing/index.html	
California Net Metering		Net Metering Rules	Wind power and solar electric							Bank kWh and then draw down from banked amount when needed.
Fueling Alternatives	CA Air Resources Board	Rebates	Purchase or lease of new eligible alternative fuel or electric vehicles	\$1.62 million (\$90k still available for alt fuel, \$231k still available for electric)	\$950-\$5,000 per vehicle			31-Mar-09	http://www.arb.ca.gov/msprog/zevprog/zip/incentiv.htm	
Water Treatment Program	PG&E	Incentive rebate/design assistance program/energy analysis	Examples: premium T-8 and T-5 lighting, occupancy sensors, daylight controls, premium efficient motors and pumps, low pressure UV disinfection, fine bubble aeration		Varies by type of technology and rebate program Based on estimation calculator			12/31/2008	http://www.pge.com/mybusiness/energysavingsrebates/incentivesbyindustry/wastewater/	

Table 6-1. Energy Funding Opportunities (continued)

Program	Agency/ Department	Incentive type	Eligible Efficiency or Renewable/Other Technologies:	Total program funds available/program budget	Amount	Funding limit	Terms	Expiration Date	Website	Comments/ Remarks
Standard Energy Efficiency Rebate Program	PG&E	Incentive rebate program	Clothes washers/dryers, dishwasher, refrigerators/freezers, dehumidifiers, water heaters, lighting, chillers, furnaces, boilers, heat pumps, air conditioners, agricultural equipment, food service equipment, business computing		Varies by type of technology and rebate program			12/31/2008	http://www.pge.com/mybusiness/energysavingsrebates/	Equipment is eligible if it was purchased between January 1, 2006 and December 31, 2008 and proof of purchase must be received by PG&E within 90 days of purchase to receive the rebate.
Customized Energy Efficiency Improvement Rebate Program	PG&E	Incentive rebate program	Examples of measures: air compressor, ASD: heating, ventilation and air conditioning, efficient boilers, efficient chillers, efficient computer equipment, efficient fans, efficient lighting, efficient motors, efficient pool heaters, reflective window film, vending machine controller, virtualization		PG&E calculator based on energy savings			12/31/2008	http://www.pge.com/mybusiness/energysavingsrebates/rebatesincentives/ief/	Contact the Business Customer Service Center at 800-468-4743. PG&E encourages customers to contact PG&E prior before submitting application and other required documentation.
New Construction Cash Incentives and Design Incentives Program	PG&E	Incentive rebate program	Rebates for technical assistance and design when building energy efficient facilities		A design team can receive up to \$50,000 for energy efficient design, while an owner can receive up to \$150,000 per facility.			12/31/2008	http://www.pge.com/mybusiness/energysavingsrebates/rebatesincentives/inc/	

7. CONCLUSIONS AND RECOMMENDATIONS

This study is focused on benchmarking PCWA's energy use, inventorying GHG emissions, and developing energy and GHG emissions alternatives. This section summarizes the key conclusions and provides next step recommendations regarding energy use, electric rate schedules, GHG emissions, energy conservation, GHG emissions reduction, alternative energy, and funding.

Measures are available to increase the efficiency of electrical consumption and reduce GHG emissions. GHG emissions are primarily from vehicle use and electricity generation to meet PCWA's electrical needs. Because energy use and GHG emissions are associated, conservation efforts to save energy also reduce GHG emissions. Conservation efforts recommended in this study are focused on reducing pumping and vehicle related energy use.

7.1 Energy Use

Current PCWA energy use primarily consists of electricity and vehicle fuels. Electricity is predominately used by WTPs and pump stations. Electrical use and cost increase with water deliveries during summer periods.

While total water use will almost double by buildout from 2007 levels, total energy use will increase by approximately eight times. The majority of the increase in energy used will be for the pumping of MFP and CVP water from the American and Sacramento Rivers. PCWA's current and future use of energy for the delivery and treatment of water per ac-ft is very low in comparison to the other water agencies in California.

PCWA should target its energy and water conservation efforts on the MFP and CVP supplies, since they have the largest energy footprint. The energy used for pumping and treating water and for operating vehicles should receive a primary focus. The design of new facilities should place an increased priority on energy efficiency.

7.2 Electric Rate Schedule Optimization

PCWA purchases electricity from three electric utilities, PG&E, Sierra Pacific, and the City of Roseville. PCWA has a total of 121 separate electrical accounts that includes 3 Sierra Pacific and 2 Roseville accounts. Over 60% of PCWA's electrical costs are billed under 4 rates (A6, A1, E19-PX, and A10-S). The majority of PCWA electrical costs are billed under 11 rate schedules. Additional investigation should be performed for the largest energy using facilities and their associated electric rate schedules. The electric accounts should be reviewed to see if any can be eliminated or consolidated. PCWA should consider implementing energy billing review methodologies to regularly monitor energy costs as some larger water agencies have done.

Large accounts should be analyzed in detail to determine which PG&E rate schedules are available for billing that account to determine if an alternate rate would result in a cost savings. Additionally, it is possible that a new rate schedule could be negotiated with PG&E for a specific electric account. This approach would have the most value for PCWA's largest electrical use accounts, specifically the Auburn Tunnel and American River Pump Stations with the emphasis on the summer costs of electricity.

7.3 GHG Emissions

Under Assembly Bill 32 (AB 32), GHG emissions became a regulated emission to be regulated by the CARB. In June 2007, CARB published a list of early action items for use in reducing GHG emissions. Water agencies such as PCWA are not required but are encouraged to report GHG emissions to CCAR. The GHG inventory indicates that 3,053 metric tons of CO_{2e} were emitted in 2007.

Since the majority of emissions are from vehicle use and electricity use, the most significant emissions reductions can be accomplished through emissions reduction efforts in these areas. Use of alternative sources of renewable energy (small hydropower and photovoltaic power in particular) provides electricity that does not have an associated GHG emission. Reduction of electricity use through the application of conservation alternatives can help reduce electricity usage, and through reduced energy use, reduce GHG emissions. Use of improved efficiency vehicles (hybrid, electric, and alternative fuels) can help reduce vehicle based GHG emissions.

PCWA should join CCAR to formally document GHG emissions. Submitting a verified GHG emissions summary to CCAR as part of membership provides a public record of PCWA's GHG emissions and creates an acknowledgement of PCWA's stewardship of the environment. The GHG emissions presented in this report are ready for input into CCAR's emissions entry tool, CARROT.

7.4 Energy Conservation Alternatives

Energy conservation measures are grouped into pumping, process, on-site power generation, vehicle fleet usage, lighting, equipment, HVAC, and general operations categories.

A number of energy conservation activities are recommended for PCWA to consider for implementation.

- Right sizing pumps by performing condition and performance assessments to determine if pumps are optimally sized for current production.
- Evaluating locations for increased water storage to allow for more off-peak pumping operations and utilizing water storage to assist in water treatment processes such as backwashing filters.
- Right size vehicle use to task.
- Invest in alternative vehicles such as hybrid cars and trucks.
- Optimizing vehicle travel routes
- Check system piping for leaks to minimize water loss.
- Installing premium energy efficient motors where older less efficient motors exist.
- Installing high efficient lighting fixtures and lamps which can result in reducing electrical use.

Alternatives to optimize energy use for the operation of PCWA's WTPs are recommended for further evaluation.

- Time of day for centrifuge sludge dewatering activities.
- Backwash water and filter-to-waste recycle.
- Water quality based operations.
- Chemical concentration.
- Change from mechanical to hydraulic mixing and flocculation.
- Future centrifuge dewatering project.
- Increase filter backwash storage.

- Pretreatment process choice.

A summary of some energy-saving measures that could be used in the water distribution system is provided below.

- Decrease the volume of water pumped.
- Lower the head against which water is pumped.
- Utilize off-peak electricity rates.
- Increase the efficiency of pumps.
- Implement on-line telemetry and control systems (SCADA).
- Determine pipelines of high headloss within the system.

Water and energy conservation are strongly linked. The implementation of water conservation BMPs saves both water and energy. The value of water saved from water conservation efforts is greatest for the MFP and CVP supplies that are pumped from the American River and the value is the greatest for water saved during a summer afternoon.

PCWA should maximize its energy cost savings by targeting its water conservation efforts on the MFP and CVP supplies, with a particular emphasis on summer water use. It is recommended that PCWA evaluate the water conservation BMPs and consider that the value of saved water varies significantly by water supply source and time of year.

7.5 Reduction of GHG Emissions

The most effective conservation and emission reduction measures target areas of use that comprise the majority of emissions. Electricity use, gasoline, and diesel use accounted for 95% of PCWA GHG emissions in 2007. Consequently GHG reduction measures should include the electricity conservation measures described in Section 4.3, and vehicle efficiency measures described in this section.

Vehicle efficiency can be increased most cost effectively by converting to new, more efficient technologies slowly. Replacement of retired gasoline vehicles with CNG or electric hybrid vehicles as available on a case by case basis would reduce gasoline use. Replacement of diesel vehicles that do not have a high power requirements with CNG or electric hybrids, when available would conserve diesel fuel. Implementation of an engine idling reduction program would also help reduce fuel use

7.6 Alternative Energy

Of the available alternative energy technologies, solar photovoltaic and small hydroelectric electricity generation are the most promising technologies for application by PCWA. PCWA should consider further evaluation of solar photovoltaic and small hydroelectric electricity generation.

It is recommended that further analysis to identify other locations be conducted. Further analysis of small hydropower should consider other potential hydroelectric sites, permitting requirements, identification of the rates paid by PG&E for electricity, and the cost-benefit analysis of the cost of construction versus the generation and sale of power to determine the payback period. PCWA should consider additional solar photovoltaic facilities. Additional study to identify the appropriate amount of solar electricity to generate and identification of the long term goal of renewable power should be conducted.

7.7 Suggested Funding Opportunities

It is recommended that PCWA further investigate the following funding opportunities:

1. PG&E Programs. The suite of available PG&E programs that includes audits, assistance, and financial incentives should be considered. The first step would be to initiate a general dialogue with PG&E regarding funding assistance. For selling alternative energy, the feed-in tariff program appears to offer the best approach for PCWA for small hydro.
2. Federal Level. CREBS provide a loan option for financing energy projects.
3. State Level:
 - a. Emerging renewables program for wind projects.
 - b. Self-generation incentive program for wind projects.
 - c. CSI rebate program for solar projects.
 - d. CARB's fueling alternatives program for vehicle fleet upgrades.
 - e. Energy efficiency financing program for loans for energy efficiency projects.

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APPENDIX A: DETAILED ENERGY USE CALCULATIONS

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity Canal Gate House

Facility Info: Canal Gate House
Address Lincoln RD, Gold Run

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
66961005	9/11/2007	9/25/2007	14	A1	\$3.91	1	
66961005	8/10/2007	9/11/2007	32	A1	\$8.52	0	
66961005	7/12/2007	8/10/2007	29	A1	\$7.72	0	
66961005	6/12/2007	7/12/2007	30	A1	\$7.98	0	
66961005	5/12/2007	6/12/2007	31	A1	\$8.25	0	
66961005	4/11/2007	5/12/2007	31	A1	\$8.25	0	
66961005	3/14/2007	4/11/2007	28	A1	\$7.45	0	
66961005	2/12/2007	3/14/2007	30	A1	\$7.99	0	
66961005	1/11/2007	2/12/2007	32	A1	\$8.52	0	
66961005	12/12/2006	1/11/2007	30	A1	\$7.99	0	
66961005	11/9/2006	12/12/2006	33	A1	\$8.78	0	
66961005	10/11/2006	11/9/2006	29	A1	\$7.72	0	
66961005	9/12/2006	10/11/2006	29	A1	\$7.72	0	
66961005	8/12/2006	9/12/2006	31	A1	\$8.25	0	
66961005	7/14/2006	8/12/2006	29	A1	\$7.72	0	
66961005	6/14/2006	7/14/2006	30	A1	\$7.98	0	
66961005	5/13/2006	6/14/2006	32	A1	\$8.52	0	
66961005	4/13/2006	5/13/2006	30	A1	\$7.98	0	
66961005	3/15/2006	4/13/2006	29	A1	\$7.84	1	
66961005	2/11/2006	3/15/2006	32	A1	\$8.51	0	
66961005	1/12/2006	2/11/2006	30	A1	\$7.98	0	
66961005	12/12/2005	1/12/2006	31	A1	\$7.87	1	
					2006	\$89.00	1
					2007	\$76.58	1
					Total	\$165.58	2

Group Name: Admin and Control Accts
Activity MiroWave Station FH

Facility Info: Microwave Station FH
Address Foresthill

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
101349005	12/17/2007	1/16/2008	30	A1	\$555.10	4,172	
101349005	11/15/2007	12/17/2007	32	A1	\$369.13	2,714	
101349005	10/17/2007	11/15/2007	29	A1	\$200.77	1,228	
101349005	9/18/2007	10/17/2007	29	A1	\$275.86	1,463	
101349005	8/17/2007	9/18/2007	32	A1	\$440.87	2,359	
101349005	7/20/2007	8/17/2007	28	A1	\$401.50	2,150	
101349005	6/19/2007	7/20/2007	31	A1	\$438.39	2,347	
101349005	5/19/2007	6/19/2007	31	A1	\$401.20	2,144	
101349005	4/19/2007	5/19/2007	30	A1	\$321.25	1,899	
101349005	3/20/2007	4/19/2007	30	A1	\$316.06	2,311	
101349005	2/17/2007	3/20/2007	31	A1	\$311.52	2,269	
101349005	1/18/2007	2/17/2007	30	A1	\$265.55	1,918	
101349005	12/18/2006	1/18/2007	31	A1	\$278.40	2,010	
101349005	11/16/2006	12/18/2006	32	A1	\$248.17	1,781	
101349005	10/19/2006	11/16/2006	28	A1	\$191.13	1,181	
101349005	9/20/2006	10/19/2006	29	A1	\$271.58	1,438	
101349005	8/19/2006	9/20/2006	32	A1	\$575.95	3,120	
101349005	7/21/2006	8/19/2006	29	A1	\$616.72	3,399	
101349005	6/21/2006	7/21/2006	30	A1	\$600.31	3,306	
101349005	5/19/2006	6/21/2006	33	A1	\$543.24	2,983	
101349005	4/19/2006	5/19/2006	30	A1	\$444.10	2,701	
101349005	3/22/2006	4/19/2006	28	A1	\$279.57	2,092	
101349005	2/17/2006	3/22/2006	33	A1	\$343.15	2,616	
101349005	1/19/2006	2/17/2006	29	A1	\$281.33	2,159	
101349005	12/19/2005	1/19/2006	31	A1	\$269.02	2,114	
					2006	\$4,395.25	26,776
					2007	\$4,020.50	24,812
					Total	\$8,415.75	51,588

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity Comm

Facility Info: Comm
Address 4982 Val Rod, Loomis

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
249858289	12/13/2007	1/14/2008	32	A1	\$11.55	20	
249858289	11/13/2007	12/13/2007	30	A1	\$10.77	21	
249858289	10/15/2007	11/13/2007	29	A1	\$10.77	19	
249858289	9/14/2007	10/15/2007	31	A1	\$12.28	22	
249858289	8/15/2007	9/14/2007	30	A1	\$12.75	26	
249858289	7/17/2007	8/15/2007	29	A1	\$12.12	24	
249858289	6/15/2007	7/17/2007	32	A1	\$13.46	27	
249858289	5/16/2007	6/15/2007	30	A1	\$12.56	25	
249858289	4/16/2007	5/16/2007	30	A1	\$11.50	22	
249858289	3/19/2007	4/16/2007	28	A1	\$9.98	19	
249858289	2/14/2007	3/19/2007	33	A1	\$11.73	22	
249858289	1/16/2007	2/14/2007	29	A1	\$10.40	20	
249858289	12/15/2006	1/16/2007	32	A1	\$11.22	20	
249858289	11/14/2006	12/15/2006	31	A1	\$11.08	21	
249858289	10/16/2006	11/14/2006	29	A1	\$10.92	20	
249858289	9/18/2006	10/16/2006	28	A1	\$11.30	21	
249858289	8/17/2006	9/18/2006	32	A1	\$13.06	25	
249858289	7/18/2006	8/17/2006	30	A1	\$11.74	21	
249858289	6/17/2006	7/18/2006	31	A1	\$11.65	19	
249858289	5/17/2006	6/17/2006	31	A1	\$9.86	9	
249858289	4/18/2006	5/17/2006	29	A1	\$8.66	6	
249858289	3/17/2006	4/18/2006	32	A1	\$8.65	1	
249858289	2/16/2006	3/17/2006	29	A1	\$7.71	0	
249858289	1/17/2006	2/16/2006	30	A1	\$7.98	0	
249858289	12/17/2005	1/17/2006	31	A1	\$7.87	0	
					2006	\$120.48	143.00
					2007	\$139.54	267.00
					Total	\$260.02	410.00

Auburn Water Treatment Plant

Group Name: Water Treatment Plant
Activity MSB/WTP

Facility Info: Auburn WTP
Address 185 Ferguson RD, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
385295127	11/10/2006	12/4/2006	24	A10S	\$73.25	0	
					2006	\$73.25	0
					2007	\$0.00	
					Total	\$73.25	0

Group Name: Water Treatment Plant

Activity:

Facility Info: Auburn WTP
Address: 185 Ferguson Rd, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
385295644	12/1/2007	1/2/2008	32	A1	\$193.13	1,360	
385295644	10/31/2007	12/1/2007	31	A1	\$171.67	1,200	
385295644	10/2/2007	10/31/2007	29	A1	\$216.70	1,120	
385295644	9/4/2007	10/2/2007	28	A1	\$230.98	1,200	
385295644	8/3/2007	9/4/2007	32	A1	\$305.87	1,600	
385295644	7/4/2007	8/3/2007	30	A1	\$305.08	1,600	
385295644	6/5/2007	7/4/2007	29	A1	\$304.68	1,600	
385295644	5/3/2007	6/5/2007	33	A1	\$320.92	1,680	
385295644	4/3/2007	5/3/2007	30	A1	\$166.72	1,120	
385295644	3/6/2007	4/3/2007	28	A1	\$160.35	1,120	
385295644	2/1/2007	3/6/2007	33	A1	\$195.40	1,360	
385295644	1/3/2007	2/1/2007	29	A1	\$172.58	1,200	
385295644	12/4/2006	1/3/2007	30	A1	\$173.27	1,200	
385295644	11/1/2006	12/4/2006	33	A1	\$185.25	1,280	
385295644	10/4/2006	11/1/2006	28	A1	\$214.58	1,120	
385295644	9/1/2006	10/4/2006	33	A1	\$321.27	1,680	
385295644	8/4/2006	9/1/2006	28	A1	\$240.56	1,280	
385295644	7/5/2006	8/4/2006	30	A1	\$212.50	1,120	
385295644	6/5/2006	7/5/2006	30	A1	\$169.50	880	
385295644	5/5/2006	6/5/2006	31	A1	\$141.22	720	
38529644	4/5/2006	5/5/2006	31	A1	\$45.56	240	
385295644	3/31/2006	5/5/2006	35	A1	\$68.03	400	
					2006	\$1,771.74	9,920
					2007	\$2,744.08	16,160
					Total	\$4,515.82	26,080

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Water Treatment Plant

Activity: MSB/WTP

Facility Info: Auburn WTP

Address: 185 Ferguson RD/MSB/WTP, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
385295851	12/1/2007	1/2/2008	32	A10S	\$5,730.04	52,200	
385295851	10/31/2007	12/1/2007	31	A10S	\$3,241.76	25,800	
385295851	10/2/2007	10/31/2007	29	A10S	\$8,809.22	55,200	
385295851	9/4/2007	10/2/2007	28	A10S	\$10,028.88	65,400	
385295851	8/2/2007	9/4/2007	33	A10S	\$19,963.81	141,000	
385295851	6/29/2007	7/3/2007	4	A10S	\$692.67	3,300	
					2006	\$0.00	0
					2007	\$48,466.38	342,900
					Total	\$48,466.38	342,900

Group Name: Water Treatment Plant

Activity: MSB/M&O

Facility Info: Auburn WTP

Address: 185 Ferguson RD/MSB/M&O, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
385295903	5/3/2007	5/16/2007	13	A10S	\$1,934.80	11,400	
385295903	4/3/2007	5/3/2007	30	A10S	\$1,178.71	8,700	
385295903	3/6/2007	4/3/2007	28	A10S	\$1,039.21	7,800	
385295903	2/1/2007	3/6/2007	33	A10S	\$1,452.00	12,000	
385295903	1/3/2007	2/1/2007	29	A10S	\$1,380.66	11,400	
385295903	12/4/2006	1/3/2007	30	A10S	\$877.13	6,900	
385295903	11/10/2006	12/4/2006	24	A10S	\$73.25	0	
					2006	\$950.38	6,900
					2007	\$6,985.38	51,300
					Total	\$7,935.76	58,200

Group Name: Water Treatment Plant

Activity: OL#1393 Removed

Facility Info: Auburn WTP

Address: 185 Ferguson RD, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782045	6/5/2006	6/6/2006	1	OL1	\$0.37	1	
1876782045	5/4/2006	6/5/2006	32	OL1	\$11.06	31	
1876782045	4/4/2006	5/4/2006	30	OL1	\$11.05	29	
1876782045	3/6/2006	4/4/2006	29	OL1	\$10.93	28	
1876782045	2/2/2006	3/6/2006	32	OL1	\$10.87	31	
1876782045	1/4/2006	2/2/2006	29	OL1	\$10.86	28	
1876782045	12/5/2005	1/4/2006	30	OL1	\$8.93	29	
					2006	\$64.07	177
					2007	\$0.00	0
					Total	\$64.07	177

Appendix A
 Pacific Gas and Electric
 Detailed Electricity Use Calculations

Group Name: Water Treatment Plant
 Activity AUB TMT PLT

Facility Info: Auburn WTP
 Address 185 Ferguson RD, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
385295830	12/4/2006	12/20/2006	16	A6	\$85.00	640
385295830	11/1/2006	12/4/2006	33	A6	\$511.73	4,160
385295830	10/4/2006	11/1/2006	28	A6	\$1,137.80	6,640
385295830	9/1/2006	10/4/2006	33	A6	\$1,554.93	9,280
385295830	8/4/2006	9/1/2006	28	A6	\$1,394.85	8,400
385295830	7/5/2006	8/4/2006	30	A6	\$1,708.36	10,720
385295830	6/5/2006	7/5/2006	30	A6	\$1,508.19	9,280
385295830	5/5/2006	6/5/2006	31	A6	\$1,209.05	7,600
385295830	4/5/2006	5/5/2006	30	A6	\$600.44	4,320
385295830	3/7/2006	4/5/2006	29	A6	\$321.25	2,640
385295830	2/3/2006	3/7/2006	32	A6	\$376.54	3,200
385295830	1/5/2006	2/3/2006	29	A6	\$366.19	3,120
385295830	12/5/2005	1/5/2006	31	A6	\$388.79	3,360
				2006	\$10,774.33	70,000
				2007	\$0.00	0
				Total	\$10,774.33	70,000

Group Name: Pump Station
 Activity Pump

Facility Info: North Auburn Pump Station
 Address 13153 Lincoln Way, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
2344496005	6/28/2007	7/19/2007	21	A6	\$9.52	0
2344496005	5/31/2007	6/28/2007	28	A6	\$12.70	0
2344496005	4/30/2007	5/31/2007	31	A6	\$14.05	0
2344496005	3/29/2007	4/30/2007	32	A6	\$14.51	0
2344496005	2/28/2007	3/29/2007	29	A6	\$13.15	0
2344496005	1/29/2007	2/28/2007	30	A6	\$13.60	0
2344496005	12/29/2006	1/29/2007	31	A6	\$14.06	0
2344496005	11/29/2006	12/29/2006	30	A6	\$13.60	0
2344496005	10/30/2006	11/29/2006	30	A6	\$446.29	2,583
2344496005	9/29/2006	10/30/2006	31	A6	\$3,144.44	21,914
2344496005	8/30/2006	9/29/2006	30	A6	\$13.60	0
2344496005	8/1/2006	8/30/2006	29	A6	\$363.26	2,110
2344496005	6/29/2006	8/1/2006	33	A6	\$15.05	1
2344496005	6/1/2006	6/29/2006	28	A6	\$12.70	0
2344496005	5/2/2006	6/1/2006	30	A6	\$13.60	0
2344496005	3/30/2006	5/2/2006	33	A6	\$14.96	0
2344496005	3/1/2006	3/30/2006	29	A6	\$13.15	0
2344496005	1/30/2006	3/1/2006	30	A6	\$13.60	0
2344496005	12/29/2005	1/30/2006	32	A6	\$14.43	0
2344496005	12/1/2005	12/29/2005	29	A6	\$12.01	0
				2006	\$4,078.68	26,608
				2007	\$91.59	0
				Total	\$4,170.27	26,608

Appendix A
 Pacific Gas and Electric
 Detailed Electricity Use Calculations

Group Name: Water Treatment Plant
 Activity: MSB/M&O

Facility Info: Auburn WTP
 Address: 185 Ferguson Rd, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
7155148704	12/3/2007	1/2/2008	30	A10S	\$4,783.65	42,000	
7155148704	10/31/2007	12/3/2007	33	A10S	\$4,545.35	39,600	
7155148704	10/2/2007	10/31/2007	29	A10S	\$5,797.73	37,200	
7155148704	9/4/2007	10/2/2007	28	A10S	\$6,295.31	38,100	
7155148704	8/2/2007	9/4/2007	33	A10S	\$8,371.11	52,200	
7155148704	7/5/2007	8/2/2007	28	A10S	\$6,916.90	41,400	
7155148704	6/5/2007	7/5/2007	30	A10S	\$7,210.87	44,100	
7155148704	5/16/2007	6/5/2007	20	A10S	\$3,034.52	17,400	
					2006	\$0.00	0
					2007	\$46,955.44	312,000
					Total	\$46,955.44	312,000
Estimated Energy Use by ADMIN building . Subtracted from this bill to help reflect accurate energy use at the Auburn WTP						148066	
						163,934	

Group Name: Water Treatment Plant
 PRV

Facility Info: Sunset WTP
 Address: 3525 Park Dr, Rocklin CA 957665

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
3890056634	11/20/2007	12/19/2007	30	A1	\$389.26	2,836	
3890056634	10/20/2007	11/19/2007	31	A1	\$418.61	2,663	
3890056634	9/21/2007	10/19/2007	29	A1	\$708.55	3,799	
3890056634	8/22/2007	9/20/2007	30	A1	\$2,155.66	11,683	
3890056634	7/25/2007	8/21/2007	28	A1	\$1,924.40	10,427	
3890056634	6/22/2007	6/30/2007	33	A1	\$2,169.14	11,750	
3890056634	5/23/2007	6/21/2007	30	A1	\$725.10	3,887	
3890056634	4/21/2007	5/22/2007	32	A1	\$793.28	4,650	
3890056634	3/23/2007	4/20/2007	29	A1	\$500.55	3,663	
3890056634	2/22/2007	3/22/2007	29	A1	\$619.12	4,543	
3890056634	1/20/2007	2/21/2007	33	A1	\$771.24	5,637	
3890056634	12/20/2006	1/19/2007	31	A1	\$1,077.69	7,915	
3890056634	11/21/2006	12/19/2006	29	A1	\$579.26	4,213	
3890056634	10/21/2006	10/31/2006	31	A1	\$499.39	3,202	
3890056634	9/23/2006	10/20/2006	28	A1	\$1,065.53	5,740	
3890056634	8/23/2006	8/31/2006	31	A1	\$2,667.13	14,551	
3890056634	7/25/2006	8/22/2006	29	A1	\$2,845.08	15,796	
3890056634	6/23/2006	7/24/2006	32	A1	\$2,636.56	14,627	
3890056634	5/24/2006	6/22/2006	30	A1	\$864.83	4,755	
3890056634	4/26/2005	5/23/2005	28	A1	\$2,106.35	12,251	
3890056634	3/25/2006	4/24/2006	31	A1	\$476.67	3,558	
3890056634	2/23/2006	3/24/2006	30	A1	\$696.06	5,335	
3890056634	1/24/2006	2/22/2006	30	A1	\$653.05	5,051	
3890056634	12/22/2005	1/23/2006	33	A1	\$745.84	5,893	
					2006	\$15,835.75	94,972
					2007	\$12,252.60	73,453
					Total	\$28,088.35	168,425

Appendix A
 Pacific Gas and Electric
 Detailed Electricity Use Calculations

Group Name: Admin and Control Accts
 Business Activity: SCADA COMM TOWER

Facility Info: SCADA Comm Tower
 Address: 3525 Park Dr, Rocklin

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
435457005	12/19/2007	1/18/2008	30	A1	\$151.87	1,096
435457005	11/19/2007	12/19/2007	30	A1	\$131.68	931
435457005	10/19/2007	11/19/2007	31	A1	\$147.38	913
435457005	9/20/2007	10/19/2007	29	A1	\$177.07	924
435457005	8/21/2007	9/20/2007	30	A1	\$202.08	1,059
435457005	7/24/2007	8/21/2007	28	A1	\$188.90	990
435457005	6/21/2007	7/24/2007	33	A1	\$223.23	1,170
435457005	5/22/2007	6/21/2007	30	A1	\$195.86	1,025
435457005	4/20/2007	5/22/2007	32	A1	\$181.21	1,030
435457005	3/22/2007	4/20/2007	29	A1	\$131.43	928
435457005	2/21/2007	3/22/2007	29	A1	\$142.60	1,010
435457005	1/19/2007	2/21/2007	33	A1	\$164.82	1,162
435457005	12/19/2006	1/19/2007	31	A1	\$167.65	1,186
435457005	11/20/2006	12/19/2006	29	A1	\$131.12	917
435457005	10/20/2006	11/20/2006	31	A1	\$162.00	1,012
435457005	9/22/2006	10/20/2006	28	A1	\$183.41	959
435457005	8/22/2006	9/22/2006	31	A1	\$212.18	1,119
435457005	7/24/2006	8/22/2006	29	A1	\$202.47	1,087
435457005	6/22/2006	7/24/2006	32	A1	\$236.06	1,270
435457005	5/23/2006	6/22/2006	30	A1	\$195.21	1,045
435457005	4/24/2006	5/23/2006	29	A1	\$163.87	923
435457005	3/24/2006	4/24/2006	31	A1	\$112.75	802
435457005	2/22/2006	3/24/2006	30	A1	\$114.89	835
435457005	1/23/2006	2/22/2006	30	A1	\$109.36	800
435457005	12/21/2005	1/23/2006	33	A1	\$118.82	888
				2006	\$1,942.14	11,657
				2007	\$2,053.91	12,328
				Total	\$3,996.05	23,985

Group Name: Pump Station
 Activity: Zone , WQ Pumping Plant

Facility Info: Tinker Road Pump Station
 Address:

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
435457235	12/14/2007	1/15/2008	32	A6	\$5,314.77	43,360
435457235	11/14/2007	12/14/2007	30	A6	\$4,910.14	42,080
435457235	10/17/2007	11/14/2007	28	A6	\$5,024.25	40,480
435457235	9/17/2007	10/17/2007	30	A6	\$6,086.57	46,880
435457235	8/16/2007	9/17/2007	32	A6	\$7,554.90	63,520
435457235	7/19/2007	8/16/2007	28	A6	\$6,415.25	54,240
435457235	6/18/2007	7/19/2007	31	A6	\$6,153.29	39,680
435457235	5/17/2007	6/18/2007	32	A6	\$5,061.95	38,400
435457235	4/17/2007	5/17/2007	30	A6	\$4,788.21	40,000
435457235	3/19/2007	4/17/2007	29	A6	\$4,045.07	34,400
435457235	2/16/2007	3/19/2007	31	A6	\$4,326.74	36,800
435457235	1/17/2007	2/16/2007	30	A6	\$4,760.10	38,400
435457235	12/15/2006	1/17/2007	33	A6	\$4,210.83	35,200
435457235	11/15/2006	12/15/2006	30	A6	\$3,691.82	33,280
435457235	10/17/2006	11/15/2006	29	A6	\$3,217.39	26,880
435457235	9/18/2006	10/17/2006	29	A6	\$7,194.62	54,240
435457235	8/18/2006	9/18/2006	31	A6	\$4,504.03	29,600
435457235	7/20/2006	8/18/2006	29	A6	\$3,271.52	18,560
435457235	6/16/2006	7/20/2006	34	A6	\$584.20	3,680
				2006	\$22,463.58	166,240
				2007	\$63,337.30	510,080
				Total	\$85,800.88	676,320

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Small Accounts

Facility Info: Happy Hollow Lane

Activity

Address

9695 Happy Hollow LN, New Castle

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
435457841	11/9/2007	12/11/2007	32	A1	\$14.89	48	
435457841	10/11/2007	11/9/2007	29	A1	\$13.08	32	
435457841	9/12/2007	10/11/2007	29	A1	\$13.40	31	
435457841	8/14/2007	9/12/2007	29	A1	\$13.77	33	
435457841	7/13/2007	8/14/2007	32	A1	\$14.75	34	
435457841	6/14/2007	7/13/2007	29	A1	\$13.59	32	
435457841	5/14/2007	6/14/2007	31	A1	\$14.11	32	
435457841	4/13/2007	5/14/2007	31	A1	\$13.71	35	
435457841	3/14/2007	4/13/2007	30	A1	\$12.78	36	
435457841	2/12/2007	3/14/2007	30	A1	\$15.75	58	
435457841	1/11/2007	2/12/2007	32	A1	\$18.46	74	
435457841	12/13/2006	1/11/2007	29	A1	\$19.41	87	
435457841	11/10/2006	12/13/2006	33	A1	\$14.43	42	
435457841	10/12/2006	11/10/2006	29	A1	\$12.89	31	
435457841	9/13/2006	10/12/2006	29	A1	\$13.22	30	
435457841	8/15/2006	9/13/2006	29	A1	\$13.33	31	
435457841	7/17/2006	8/15/2006	29	A1	\$13.28	31	
435457841	6/14/2006	7/17/2006	33	A1	\$15.05	35	
435457841	5/15/2006	6/14/2006	30	A1	\$13.71	32	
435457841	4/14/2006	5/15/2006	31	A1	\$13.19	32	
435457841	3/16/2006	4/14/2006	29	A1	\$12.13	34	
435457841	2/13/2006	3/16/2006	31	A1	\$15.14	54	
435457841	1/12/2006	2/13/2006	32	A1	\$13.96	43	
435457841	12/15/2005	1/12/2006	28	A1	\$11.16	34	
					2006	\$161.49	429
					2007	\$177.70	532
					Total	\$339.19	961

Group Name: Small Accounts

Facility Info: Happy Hollow Lane

Activity

Address

9695 Happy Hollow LN, New Castle

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
438580911	11/1/2007	12/1/2007	31	OL1	\$11.25	30	
438580911	10/3/2007	10/31/2007	29	OL1	\$11.25	28	
438580911	9/4/2007	10/2/2007	29	OL1	\$11.25	28	
438580911	8/3/2007	9/3/2007	32	OL1	\$11.25	31	
438580911	07/04/2007	8/2/2007	30	OL1	\$11.20	29	
438580911	6/5/2007	6/30/2007	29	OL1	\$11.25	28	
438580911	5/4/2007	6/4/2007	32	OL1	\$11.24	31	
438580911	4/4/2007	5/3/2007	30	OL1	\$11.25	29	
438580911	3/7/2007	4/3/2007	28	OL1	\$11.25	27	
438580911	2/2/2007	3/6/2007	33	OL1	\$11.31	32	
438580911	1/4/2007	2/1/2007	29	OL1	\$11.33	28	
438580911	12/5/2006	1/3/2007	30	OL1	\$11.23	29	
438580911	11/2/2006	12/4/2006	32	OL1	\$11.22	32	
438580911	9/2/2006	10/3/2006	32	OL1	\$11.22	31	
438580911	8/4/2006	8/31/2006	29	OL1	\$11.07	28	
438580911	7/6/2006	8/3/2006	29	OL1	\$11.07	28	
438580911	6/6/2006	7/5/2006	30	OL1	\$11.07	29	
438580911	4/20/2006	6/5/2006	47	OL1	\$17.33	45	
					2006	\$72.98	193
					2007	\$135.06	350
					Total	\$208.04	543

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Water Treatment Plant
Activity: Applegate Treatment Plant

Facility Info: Applegate WTP

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
602610005	12/20/2007	1/19/2008	30	A10S	\$781.89	6,066
602610005	11/20/2007	12/20/2007	30	A10S	\$831.12	6,426
602610005	10/22/2007	11/20/2007	29	A10S	\$579.56	3,862
602610005	9/21/2007	10/22/2007	31	A10S	\$662.19	3,535
602610005	8/22/2007	9/21/2007	30	A10S	\$786.39	4,185
602610005	7/25/2007	8/22/2007	28	A10S	\$772.82	4,128
602610005	6/22/2007	7/25/2007	33	A10S	\$877.60	4,978
602610005	5/23/2007	6/22/2007	30	A10S	\$911.52	5,309
602610005	4/23/2007	5/23/2007	30	A10S	\$805.11	4,797
602610005	3/26/2007	4/23/2007	28	A10S	\$567.96	3,926
602610005	2/22/2007	3/26/2007	32	A10S	\$717.04	5,298
602610005	1/23/2007	2/22/2007	30	A10S	\$809.30	6,183
602610005	12/22/2006	1/23/2007	32	A10S	\$1,038.39	8,302
602610005	11/21/2006	12/22/2006	31	A10S	\$866.38	6,705
602610005	10/23/2006	11/21/2006	29	A10S	\$574.67	3,606
602610005	9/25/2006	10/23/2006	28	A10S	\$731.25	3,915
602610005	8/24/2006	9/25/2006	32	A10S	\$890.92	5,113
602610005	7/26/2006	8/24/2006	29	A10S	\$887.96	4,974
602610005	6/23/2006	7/26/2006	33	A10S	\$921.19	5,135
602610005	5/24/2006	6/23/2006	30	A10S	\$777.01	4,280
602610005	4/26/2006	5/24/2006	28	A10S	\$737.13	3,982
602610005	3/25/2006	4/26/2006	32	A10S	\$637.37	4,221
602610005	2/23/2006	3/25/2006	30	A10S	\$715.42	5,076
602610005	1/24/2006	2/23/2006	30	A10S	\$634.21	4,385
602610005	12/23/2005	1/24/2006	32	A10S	\$687.16	5,281
Applegate Electrical Consumption				2006	\$9,060.67	56,673
				2007	\$9,359.00	66,995
				Total	\$18,419.67	123,668

Group Name: Water Treatment Plant
Activity: ALTA TREATMENT PLANT

Facility Info: Alta WTP

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
1139558005	12/6/2007	1/7/2008	32	A6	\$683.96	5,751
1139558005	11/6/2007	12/6/2007	30	A6	\$676.18	5,735
1139558005	10/8/2007	11/6/2007	29	A6	\$711.97	4,883
1139558005	9/10/2007	10/8/2007	28	A6	\$562.55	3,777
1139558005	8/9/2007	9/10/2007	32	A6	\$664.51	4,455
1139558005	7/11/2007	8/9/2007	29	A6	\$611.66	3,921
1139558005	6/8/2007	7/11/2007	33	A6	\$855.81	5,515
1139558005	5/9/2007	6/8/2007	30	A6	\$643.07	4,224
1139558005	4/9/2007	5/9/2007	30	A6	\$593.25	4,531
1139558005	3/12/2007	4/9/2007	28	A6	\$455.32	3,732
1139558005	2/7/2007	3/12/2007	33	A6	\$598.69	5,032
1139558005	1/9/2007	2/7/2007	29	A6	\$655.20	5,390
1139558005	12/9/2006	1/9/2007	31	A6	\$667.91	5,572
1139558005	11/7/2006	12/9/2006	32	A6	\$739.68	6,087
1139558005	10/10/2006	11/7/2006	28	A6	\$548.85	3,596
1139558005	9/11/2006	10/10/2006	29	A6	\$673.96	4,297
1139558005	8/10/2006	9/11/2006	32	A6	\$866.33	5,839
1139558005	7/12/2006	8/10/2006	29	A6	\$965.99	6,334
1139558005	6/12/2006	7/12/2006	30	A6	\$956.80	6,326
1139558005	5/10/2006	6/12/2006	33	A6	\$696.45	4,647
1139558005	4/10/2006	5/10/2006	30	A6	\$593.81	4,557
1139558005	3/10/2006	4/10/2006	31	A6	\$671.09	5,817
1139558005	2/9/2006	3/10/2006	29	A6	\$465.32	3,910
1139558005	1/10/2006	2/9/2006	30	A6	\$628.98	5,410
1139558005	12/9/2005	1/10/2006	32	A6	\$591.58	5,221
Alta Electrical Consumption				2006	\$8,398.84	62,041
				2007	\$7,696.12	56,767
				Total	\$16,094.96	118,808

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity Pressure Reducing STA

Facility Info: Pressure Reducing Sta - Crest Ave
Address Crest Ave@ Whitney Blvd, Rocklin

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1862474005	11/19/2007	12/19/2007	30	A1	\$11.30	25	
1862474005	10/22/2007	11/19/2007	28	A1	\$11.20	25	
1862474005	9/20/2007	10/22/2007	32	A1	\$13.83	29	
1862474005	8/21/2007	9/20/2007	30	A1	\$13.84	32	
1862474005	7/24/2007	8/21/2007	28	A1	\$12.76	29	
1862474005	6/22/2007	7/24/2007	32	A1	\$14.77	34	
1862474005	5/22/2007	6/22/2007	31	A1	\$13.93	31	
1862474005	4/23/2007	5/22/2007	29	A1	\$12.50	28	
1862474005	3/22/2007	4/23/2007	32	A1	\$12.39	29	
1862474005	2/21/2007	3/22/2007	29	A1	\$11.18	26	
1862474005	1/22/2007	2/21/2007	30	A1	\$11.48	26	
1862474005	12/21/2006	1/22/2007	32	A1	\$12.01	26	
1862474005	11/20/2006	12/21/2006	31	A1	\$11.75	26	
1862474005	10/20/2006	11/20/2006	31	A1	\$12.50	28	
1862474005	9/22/2006	10/20/2006	28	A1	\$12.40	27	
1862474005	8/22/2006	9/22/2006	31	A1	\$14.63	35	
1862474005	7/25/2006	8/22/2006	28	A1	\$13.01	31	
1862474005	6/22/2006	7/25/2006	33	A1	\$15.59	38	
1862474005	5/23/2006	6/22/2006	30	A1	\$13.54	31	
1862474005	4/24/2006	5/23/2006	29	A1	\$12.62	29	
1862474005	3/24/2006	4/24/2006	31	A1	\$11.65	26	
1862474005	2/22/2006	3/24/2006	30	A1	\$11.18	25	
1862474005	1/23/2006	2/22/2006	30	A1	\$11.28	26	
					2006	\$140.15	322
					2007	\$151.19	340
					Total	\$291.34	662

Group Name: Small Accounts
Activity Water Tank

Facility Info: Water Tank
Address XSTR from 444 Nevada, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1864234005	11/27/2007	12/26/2007	29	A1	\$12.77	38	
1864234005	10/25/2007	11/27/2007	33	A1	\$14.61	41	
1864234005	9/26/2007	10/25/2007	29	A1	\$14.69	38	
1864234005	8/25/2007	9/26/2007	32	A1	\$16.40	43	
1864234005	7/30/2007	8/25/2007	26	A1	\$13.52	36	
1864234005	6/27/2007	7/30/2007	33	A1	\$17.21	46	
1864234005	5/29/2007	6/27/2007	29	A1	\$14.87	39	
1864234005	4/27/2007	5/29/2007	32	A1	\$16.01	42	
1864234005	3/28/2007	4/27/2007	30	A1	\$12.91	37	
1864234005	2/27/2007	3/28/2007	29	A1	\$12.39	35	
1864234005	1/26/2007	2/27/2007	32	A1	\$13.35	36	
1864234005	12/28/2006	1/26/2007	29	A1	\$12.29	34	
1864234005	11/29/2006	12/28/2006	29	A1	\$12.16	33	
1864234005	10/27/2006	11/29/2006	33	A1	\$14.12	38	
1864234005	9/27/2006	10/27/2006	30	A1	\$14.59	36	
1864234005	8/28/2006	9/27/2006	30	A1	\$15.49	41	
1864234005	7/28/2006	8/28/2006	31	A1	\$16.13	44	
1864234005	6/28/2006	7/28/2006	30	A1	\$15.33	41	
1864234005	5/30/2006	6/28/2006	29	A1	\$14.35	37	
1864234005	5/1/2006	5/30/2006	29	A1	\$13.99	35	
1864234005	3/29/2006	5/1/2006	33	A1	\$13.80	38	
1864234005	3/1/2006	3/29/2006	28	A1	\$11.43	31	
1864234005	1/27/2006	3/1/2006	33	A1	\$13.61	38	
1864234005	12/29/2005	1/27/2006	29	A1	\$11.84	33	
					2006	\$166.84	445
					2007	\$171.02	465
					Total	\$337.86	910

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity: N AUB PUMPS

Facility Info: N Aub Pumps
Address: E Lincoln Wy N Auburn, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
1876782015	5/31/2007	6/28/2007	28	A1	\$61.99	278
1876782015	4/30/2007	5/31/2007	31	A1	\$41.91	162
1876782015	3/29/2007	4/30/2007	32	A1	\$18.62	45
1876782015	2/28/2007	3/29/2007	29	A1	\$15.96	34
1876782015	1/29/2007	2/28/2007	30	A1	\$20.83	67
1876782015	12/29/2006	1/29/2007	31	A1	\$15.03	21
1876782015	11/29/2006	12/29/2006	30	A1	\$19.24	55
1876782015	10/30/2006	11/29/2006	30	A1	\$14.00	16
1876782015	9/29/2006	10/30/2006	31	A1	\$154.80	777
1876782015	8/30/2006	9/29/2006	30	A1	\$11.82	0
1876782015	8/1/2006	8/30/2006	29	A1	\$147.24	758
1876782015	6/29/2006	8/1/2006	33	A1	\$13.01	0
1876782015	6/1/2006	6/29/2006	28	A1	\$11.04	0
1876782015	5/2/2006	6/1/2006	30	A1	\$65.58	300
1876782015	3/30/2006	5/2/2006	33	A1	\$61.15	360
1876782015	3/1/2006	3/30/2006	29	A1	\$16.17	37
1876782015	1/30/2006	3/1/2006	30	A1	\$20.95	72
1876782015	12/29/2005	1/30/2006	32	A1	\$33.99	170
				2006	\$568.99	2,545
				2007	\$174.34	607
				Total	\$743.33	3,152

Group Name: Small Accounts
Activity: ELECT ST PUMPS

Facility Info: Elec St Pumps
Address: Electric st, Auburn, Reservoir-Press System

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
1876782020	12/28/2007	1/25/2008	28	A1	\$53.87	352
1876782020	11/29/2007	12/28/2007	29	A1	\$47.58	300
1876782020	10/26/2007	11/29/2007	34	A1	\$48.47	281
1876782020	9/27/2007	10/26/2007	29	A1	\$57.76	273
1876782020	8/28/2007	9/27/2007	30	A1	\$125.83	643
1876782020	7/31/2007	8/28/2007	28	A1	\$164.71	858
1876782020	6/28/2007	7/31/2007	33	A1	\$183.07	951
1876782020	5/31/2007	6/28/2007	28	A1	\$144.73	749
1876782020	4/30/2007	5/31/2007	31	A1	\$166.97	866
1876782020	3/29/2007	4/30/2007	32	A1	\$105.43	727
1876782020	2/28/2007	3/29/2007	29	A1	\$95.30	657
1876782020	1/29/2007	2/28/2007	30	A1	\$112.86	781
1876782020	12/29/2006	1/29/2007	31	A1	\$177.08	1,257
1876782020	11/29/2006	12/29/2006	30	A1	\$109.57	755
1876782020	10/30/2006	11/29/2006	30	A1	\$105.65	717
1876782020	9/29/2006	10/30/2006	31	A1	\$140.91	723
1876782020	8/30/2006	9/29/2006	30	A1	\$134.67	691
1876782020	8/1/2006	8/30/2006	29	A1	\$125.25	656
1876782020	6/29/2006	8/1/2006	33	A1	\$143.34	751
1876782020	6/1/2006	6/29/2006	28	A1	\$120.15	629
1876782020	5/2/2006	6/1/2006	30	A1	\$126.77	663
1876782020	3/30/2006	5/2/2006	33	A1	\$115.62	799
1876782020	3/1/2006	3/30/2006	29	A1	\$86.91	617
1876782020	1/31/2006	3/1/2006	29	A1	\$140.34	1,046
1876782020	12/29/2005	1/31/2006	33	A1	\$161.33	1,209
				2006	\$1,510.51	9,256
				2007	\$1,429.79	8,343
				Total	\$2,940.30	17,599

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity Chan HL TMT PLT

Facility Info: Chan HL TmT PLT
Address 365 Channel Hill RD, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782025	12/31/2007	1/28/2008	28	A1	\$12.42	0	
1876782025	11/30/2007	12/31/2007	31	A1	\$12.22	0	
1876782025	10/29/2007	11/30/2007	32	A1	\$12.62	0	
1876782025	9/28/2007	10/29/2007	31	A1	\$12.22	0	
1876782025	8/29/2007	9/28/2007	30	A1	\$11.83	0	
1876782025	8/1/2007	8/29/2007	28	A1	\$11.04	0	
1876782025	6/30/2007	8/1/2007	32	A1	\$12.62	0	
1876782025	6/1/2007	6/30/2007	29	A1	\$16.20	26	
1876782025	5/1/2007	6/1/2007	31	A1	\$17.89	31	
1876782025	3/30/2007	5/1/2007	32	A1	\$16.80	31	
1876782025	3/2/2007	3/30/2007	28	A1	\$13.97	22	
1876782025	1/30/2007	3/2/2007	31	A1	\$15.70	26	
1876782025	12/30/2006	1/30/2007	31	A1	\$16.51	32	
1876782025	11/30/2006	12/30/2006	30	A1	\$15.73	29	
1876782025	10/30/2006	11/30/2006	31	A1	\$16.58	32	
1876782025	10/2/2006	10/30/2006	28	A1	\$16.18	28	
1876782025	8/31/2006	10/2/2006	32	A1	\$18.68	33	
1876782025	8/2/2006	8/31/2006	29	A1	\$16.80	30	
1876782025	6/30/2006	8/2/2006	33	A1	\$19.10	34	
1876782025	6/1/2006	6/30/2006	29	A1	\$16.80	30	
1876782025	5/3/2006	6/1/2006	29	A1	\$14.83	19	
1876782025	3/31/2006	5/3/2006	33	A1	\$15.98	22	
1876782025	3/2/2006	3/31/2006	29	A1	\$13.99	20	
1876782025	2/1/2006	3/2/2006	29	A1	\$13.98	20	
1876782025	12/30/2005	2/1/2006	33	A1	\$15.75	22	
					2006	\$194.40	319
					2007	\$169.62	168
					Total	\$364.02	487

Group Name: Small Accounts
Activity 185 FGSN OUTDR LT

Facility Info: Outdoor Lights
Address 305 Ferguson, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782050	12/1/2007	1/2/2008	32	OL1	\$11.16	31	
1876782050	10/31/2007	12/1/2007	31	OL1	\$11.24	30	
1876782050	10/2/2007	10/31/2007	29	OL1	\$11.24	28	
1876782050	9/3/2007	10/2/2007	29	OL1	\$11.24	28	
1876782050	8/2/2007	9/3/2007	32	OL1	\$11.24	31	
1876782050	7/3/2007	8/2/2007	30	OL1	\$11.24	29	
1876782050	6/4/2007	7/3/2007	29	OL1	\$11.24	28	
1876782050	5/3/2007	6/4/2007	32	OL1	\$11.23	31	
1876782050	4/3/2007	5/3/2007	30	OL1	\$11.24	29	
1876782050	3/6/2007	4/3/2007	28	OL1	\$11.24	27	
1876782050	2/1/2007	3/6/2007	33	OL1	\$11.30	32	
1876782050	1/3/2007	2/1/2007	29	OL1	\$11.32	28	
1876782050	12/4/2006	1/3/2007	30	OL1	\$11.22	29	
1876782050	11/1/2006	12/4/2006	33	OL1	\$11.21	32	
1876782050	10/3/2006	11/1/2006	29	OL1	\$11.21	28	
1876782050	9/1/2006	10/3/2006	32	OL1	\$11.21	31	
1876782050	8/3/2006	9/1/2006	29	OL1	\$11.06	28	
1876782050	7/5/2006	8/3/2006	29	OL1	\$11.06	28	
1876782050	6/5/2006	7/5/2006	30	OL1	\$11.06	29	
1876782050	5/4/2006	6/5/2006	32	OL1	\$11.06	31	
1876782050	4/4/2006	5/4/2006	30	OL1	\$11.05	29	
1876782050	3/6/2006	4/4/2006	29	OL1	\$10.93	28	
1876782050	2/2/2006	3/6/2006	32	OL1	\$10.87	31	
1876782050	1/4/2006	2/2/2006	29	OL1	\$10.86	28	
1876782050	12/5/2005	1/4/2006	30	OL1	\$8.93	29	
					2006	\$121.58	323
					2007	\$134.99	350
					Total	\$256.57	673

Appendix A
 Pacific Gas and Electric
 Detailed Electricity Use Calculations

Group Name: Small Accounts
 Activity AUB TMT PL OUTDR LT

Facility Info: Outdoor Lights
 Address N Auburn ATR PLT, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
1876782055	12/1/2007	1/2/2008	32	OL1	\$17.74	86
1876782055	10/31/2007	12/1/2007	31	OL1	\$17.86	84
1876782055	10/2/2007	10/31/2007	29	OL1	\$17.86	78
1876782055	9/3/2007	10/2/2007	29	OL1	\$17.86	78
1876782055	8/2/2007	9/3/2007	32	OL1	\$17.86	86
1876782055	7/3/2007	8/2/2007	30	OL1	\$17.86	81
1876782055	6/4/2007	7/3/2007	29	OL1	\$17.87	78
1876782055	5/3/2007	6/4/2007	32	OL1	\$17.86	86
1876782055	4/3/2007	5/3/2007	30	OL1	\$17.87	81
1876782055	3/6/2007	4/3/2007	28	OL1	\$17.86	76
1876782055	2/1/2007	3/6/2007	33	OL1	\$18.05	89
1876782055	1/3/2007	2/1/2007	29	OL1	\$18.09	78
1876782055	12/4/2006	1/3/2007	30	OL1	\$17.81	81
1876782055	11/1/2006	12/4/2006	33	OL1	\$17.78	89
1876782055	10/3/2006	11/1/2006	29	OL1	\$17.77	78
1876782055	9/1/2006	10/3/2006	32	OL1	\$17.78	86
1876782055	8/3/2006	9/1/2006	29	OL1	\$17.36	78
1876782055	7/5/2006	8/3/2006	29	OL1	\$17.35	78
1876782055	6/5/2006	7/5/2006	30	OL1	\$17.35	81
1876782055	5/4/2006	6/5/2006	32	OL1	\$17.35	86
1876782055	4/4/2006	5/4/2006	30	OL1	\$17.35	81
1876782055	3/6/2006	4/4/2006	29	OL1	\$17.00	78
1876782055	2/2/2006	3/6/2006	32	OL1	\$16.83	86
1876782055	1/4/2006	2/2/2006	29	OL1	\$16.80	78
1876782055	12/5/2005	1/4/2006	30	OL1	\$16.55	81
				2006	\$190.72	899
				2007	\$214.71	976
				Total	\$405.43	1,875

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity Telemetering Tanksite

Facility Info: Telemetering Tanksite
Address S?HWY 65, Lincoln

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782060	12/4/2007	1/3/2008	30	A1	\$8.08	0	
1876782060	11/1/2007	12/4/2007	33	A1	\$8.78	0	
1876782060	10/3/2007	11/1/2007	29	A1	\$7.72	0	
1876782060	9/4/2007	10/3/2007	29	A1	\$7.72	0	
1876782060	8/6/2007	9/4/2007	29	A1	\$7.72	0	
1876782060	7/5/2007	8/6/2007	32	A1	\$8.52	0	
1876782060	6/6/2007	7/5/2007	29	A1	\$7.72	0	
1876782060	5/4/2007	6/6/2007	33	A1	\$8.79	0	
1876782060	4/4/2007	5/4/2007	30	A1	\$7.98	0	
1876782060	3/6/2007	4/4/2007	29	A1	\$7.72	0	
1876782060	2/1/2007	3/6/2007	33	A1	\$8.79	0	
1876782060	1/4/2007	2/1/2007	28	A1	\$7.45	0	
1876782060	12/4/2006	1/4/2007	31	A1	\$8.25	0	
1876782060	11/2/2006	12/4/2006	32	A1	\$8.51	0	
1876782060	10/5/2006	11/2/2006	28	A1	\$7.45	0	
1876782060	9/5/2006	10/5/2006	30	A1	\$7.98	0	
1876782060	8/5/2006	9/5/2006	31	A1	\$8.25	0	
1876782060	7/6/2006	8/5/2006	30	A1	\$7.98	0	
1876782060	6/6/2006	7/6/2006	30	A1	\$7.98	0	
1876782060	5/8/2006	6/6/2006	29	A1	\$7.72	0	
1876782060	4/5/2006	5/8/2006	33	A1	\$8.78	0	
1876782060	3/7/2006	4/5/2006	29	A1	\$7.72	0	
1876782060	2/3/2006	3/7/2006	32	A1	\$8.51	0	
1876782060	1/5/2006	2/3/2006	29	A1	\$7.72	0	
1876782060	12/5/2005	1/5/2006	31	A1	\$7.56	0	
					2006	\$88.60	0
					2007	\$97.16	0
					Total	\$185.76	0

Group Name: Small Accounts
Activity Water Monitoring Equip

Facility Info: Water Monitoring Equipment
Address 1001 Old Airport Rd, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782065	12/31/2007	1/29/2008	29	A1	\$9.23	5	
1876782065	12/1/2007	12/31/2007	30	A1	\$9.31	10	
1876782065	10/30/2007	12/1/2007	32	A1	\$9.33	6	
1876782065	10/1/2007	10/30/2007	29	A1	\$8.64	5	
1876782065	8/29/2007	10/1/2007	33	A1	\$9.15	2	
1876782065	8/2/2007	8/29/2007	27	A1	\$7.19	0	
1876782065	7/3/2007	8/2/2007	30	A1	\$7.98	0	
1876782065	6/1/2007	7/3/2007	32	A1	\$8.52	0	
1876782065	5/2/2007	6/1/2007	30	A1	\$7.99	0	
1876782065	4/2/2007	5/2/2007	30	A1	\$8.12	1	
1876782065	3/5/2007	4/2/2007	28	A1	\$8.38	7	
1876782065	1/31/2007	3/5/2007	33	A1	\$11.87	23	
1876782065	1/2/2007	1/31/2007	29	A1	\$9.20	11	
1876782065	12/1/2006	1/2/2007	32	A1	\$10.12	12	
1876782065	10/31/2006	12/1/2006	31	A1	\$8.25	0	
1876782065	10/3/2006	10/31/2006	28	A1	\$7.45	0	
1876782065	8/31/2006	10/3/2006	33	A1	\$15.39	36	
1876782065	8/3/2006	8/31/2006	28	A1	\$13.72	35	
1876782065	7/3/2006	8/3/2006	31	A1	\$15.95	43	
1876782065	6/3/2006	7/3/2006	30	A1	\$13.35	30	
1876782065	5/3/2006	6/3/2006	31	A1	\$13.62	30	
1876782065	4/3/2006	5/3/2006	30	A1	\$13.56	41	
1876782065	3/6/2006	4/3/2006	28	A1	\$16.20	68	
1876782065	2/2/2006	3/6/2006	32	A1	\$17.41	70	
1876782065	1/4/2006	2/2/2006	29	A1	\$18.62	86	
1876782065	12/2/2005	1/4/2006	33	A1	\$21.02	109	
					2006	\$163.64	451
					2007	\$105.68	65
					Total	\$269.32	516

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Skyridge Pump Station

Group Name: Pump Stations

Activity:

Facility Info: Skyridge Pump Station

Address: Riverview Dr, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782075	12/10/2007	1/9/2008	30	A6	\$578.45	4,876	
1876782075	11/8/2007	12/10/2007	32	A6	\$684.24	5,893	
1876782075	10/10/2007	11/8/2007	29	A6	\$799.55	5,820	
1876782075	9/11/2007	10/10/2007	29	A6	\$1,183.88	8,343	
1876782075	8/10/2007	9/11/2007	32	A6	\$1,398.23	9,959	
1876782075	7/12/2007	8/10/2007	29	A6	\$1,761.92	13,055	
1876782075	6/12/2007	7/12/2007	30	A6	\$1,559.65	11,207	
1876782075	5/11/2007	6/12/2007	32	A6	\$1,353.73	9,723	
1876782075	4/12/2007	5/11/2007	29	A6	\$810.94	6,225	
1876782075	3/13/2007	4/12/2007	30	A6	\$808.15	6,925	
1876782075	2/1/2007	3/13/2007	40	A6	\$710.77	5,947	
1876782075	1/10/2007	2/1/2007	22	A6	\$390.94	3,271	
1876782075	12/12/2006	1/10/2007	29	A6	\$509.20	4,245	
1876782075	11/9/2006	12/12/2006	33	A6	\$626.75	5,258	
1876782075	10/11/2006	11/9/2006	29	A6	\$914.00	6,663	
1876782075	9/12/2006	10/11/2006	29	A6	\$1,341.03	9,499	
1876782075	8/14/2006	9/12/2006	29	A6	\$1,496.73	10,972	
1876782075	7/13/2006	8/14/2006	32	A6	\$1,916.12	14,405	
1876782075	6/14/2006	7/13/2006	29	A6	\$1,168.15	8,419	
1876782075	5/12/2006	6/14/2006	33	A6	\$1,260.68	9,372	
1876782075	4/13/2006	5/12/2006	29	A6	\$755.18	5,700	
1876782075	3/6/2006	4/13/2006	38	A6	\$668.44	5,700	
1876782075	2/11/2006	3/6/2006	23	A6	\$409.87	3,577	
1876782075	1/11/2006	2/11/2006	31	A6	\$530.50	4,609	
1876782075	12/13/2005	1/11/2006	29	A6	\$488.18	4,381	
					2006	\$11,087.45	84,174
					2007	\$11,971.20	90,613
					Total	\$23,058.65	184,044

Group Name: Admin and Control Accts
Activity: MAINTENANCE COMPLEX

Facility Info: Maidu Maintenance Complex
Address: Maidu Dr at Canyon, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782085	12/10/2007	1/9/2008	30	A10S	\$2,091.83	17,520	
1876782085	11/8/2007	12/10/2007	32	A10S	\$1,875.97	15,360	
1876782085	10/10/2007	11/8/2007	29	A10S	\$2,423.51	14,400	
1876782085	9/11/2007	10/10/2007	29	A10S	\$2,790.54	15,000	
1876782085	8/10/2007	9/11/2007	32	A10S	\$5,144.04	22,440	
1876782085	7/12/2007	8/10/2007	29	A10S	\$2,976.77	21,120	
1876782085	6/12/2007	7/12/2007	30	A10S	\$3,631.16	20,880	
1876782085	5/11/2007	6/12/2007	32	A10S	\$3,082.86	17,160	
1876782085	4/12/2007	5/11/2007	29	A10S	\$2,295.29	15,240	
1876782085	3/14/2007	4/12/2007	29	A10S	\$3,164.25	13,440	
1876782085	2/9/2007	3/14/2007	33	A10S	\$3,319.58	15,720	
1876782085	1/10/2007	2/9/2007	30	A10S	\$2,082.04	17,280	
1876782085	12/12/2006	1/10/2007	29	A10S	\$1,875.12	15,120	
1876782085	11/9/2006	12/12/2006	33	A10S	\$1,716.91	13,680	
1876782085	10/11/2006	11/9/2006	29	A10S	\$2,010.31	12,240	
1876782085	9/12/2006	10/11/2006	29	A10S	\$2,396.74	12,840	
1876782085	8/14/2006	9/12/2006	29	A10S	\$3,323.86	18,480	
1876782085	7/14/2006	8/14/2006	31	A10S	\$3,898.93	22,440	
1876782085	6/14/2006	7/14/2006	30	A10S	\$3,670.38	20,760	
1876782085	5/12/2006	6/14/2006	33	A10S	\$3,247.89	17,640	
1876782085	4/13/2006	5/12/2006	29	A10S	\$2,342.81	15,720	
1876782085	3/14/2006	4/13/2006	30	A10S	\$2,105.42	17,280	
1876782085	2/13/2006	3/14/2006	29	A10S	\$2,052.98	16,800	
1876782085	1/11/2006	2/13/2006	33	A10S	\$2,271.84	19,080	
1876782085	12/13/2005	1/11/2006	29	A10S	\$1,857.66	16,080	
					2006	\$29,038.07	186,960
					2007	\$34,661.13	203,160
					Total	\$63,699.20	390,120

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity Water Tank

Facility Info: Water Tank
Address Auburn Folsom Rd, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782090	12/10/2007	1/9/2008	30	A1	\$17.34	69	
1876782090	11/8/2007	12/10/2007	32	A1	\$19.68	84	
1876782090	10/10/2007	11/8/2007	29	A1	\$22.12	85	
1876782090	9/11/2007	10/10/2007	29	A1	\$24.21	90	
1876782090	8/10/2007	9/11/2007	32	A1	\$27.39	103	
1876782090	7/13/2007	8/10/2007	28	A1	\$23.39	87	
1876782090	6/12/2007	7/13/2007	31	A1	\$25.85	96	
1876782090	5/11/2007	6/12/2007	32	A1	\$24.27	86	
1876782090	4/11/2007	5/11/2007	30	A1	\$19.06	73	
1876782090	3/14/2007	4/11/2007	28	A1	\$16.78	70	
1876782090	2/10/2007	3/14/2007	32	A1	\$18.69	76	
1876782090	1/10/2007	2/10/2007	31	A1	\$16.84	64	
1876782090	12/11/2006	1/10/2007	30	A1	\$14.84	51	
1876782090	11/9/2006	12/11/2006	32	A1	\$17.26	65	
1876782090	10/12/2006	11/9/2006	28	A1	\$20.88	80	
1876782090	9/12/2006	10/12/2006	30	A1	\$24.49	90	
1876782090	8/11/2006	9/12/2006	32	A1	\$25.87	96	
1876782090	7/13/2006	8/11/2006	29	A1	\$23.67	89	
1876782090	6/14/2006	7/13/2006	29	A1	\$24.03	91	
1876782090	5/12/2006	6/14/2006	33	A1	\$23.65	83	
1876782090	4/13/2006	5/12/2006	29	A1	\$17.36	64	
1876782090	3/14/2006	4/13/2006	30	A1	\$16.27	64	
1876782090	2/10/2006	3/14/2006	32	A1	\$18.07	75	
1876782090	1/11/2006	2/10/2006	30	A1	\$16.34	66	
1876782090	12/13/2005	1/11/2006	29	A1	\$15.02	64	
					2006	\$227.89	863
					2007	\$253.12	965
					Total	\$513.37	1,828

Group Name: Small Accounts
Activity Water Tank

Facility Info: Water Tank
Address Chantry Hill RD, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782095	12/10/2007	1/9/2008	30	A1	\$27.11	143	
1876782095	11/8/2007	12/10/2007	32	A1	\$29.38	157	
1876782095	10/10/2007	11/8/2007	29	A1	\$30.93	137	
1876782095	9/11/2007	10/10/2007	29	A1	\$40.34	178	
1876782095	8/10/2007	9/11/2007	32	A1	\$32.72	132	
1876782095	7/12/2007	8/10/2007	29	A1	\$31.18	128	
1876782095	6/12/2007	7/12/2007	30	A1	\$32.36	133	
1876782095	5/11/2007	6/12/2007	32	A1	\$40.94	177	
1876782095	4/11/2007	5/11/2007	30	A1	\$35.13	179	
1876782095	3/13/2007	4/11/2007	29	A1	\$25.19	131	
1876782095	2/9/2007	3/13/2007	32	A1	\$28.75	151	
1876782095	1/10/2007	2/9/2007	30	A1	\$27.45	145	
1876782095	12/11/2006	1/10/2007	30	A1	\$27.47	145	
1876782095	11/9/2006	12/11/2006	32	A1	\$29.24	154	
1876782095	10/11/2006	11/9/2006	29	A1	\$30.95	138	
1876782095	9/12/2006	10/11/2006	29	A1	\$29.74	120	
1876782095	8/11/2006	9/12/2006	32	A1	\$105.41	536	
1876782095	7/14/2006	8/11/2006	28	A1	\$98.11	506	
1876782095	6/14/2006	7/14/2006	30	A1	\$104.55	539	
1876782095	5/12/2006	6/14/2006	33	A1	\$112.34	578	
1876782095	4/13/2006	5/12/2006	29	A1	\$23.85	107	
1876782095	3/15/2006	4/13/2006	29	A1	\$25.45	137	
1876782095	2/10/2006	3/15/2006	33	A1	\$28.80	157	
1876782095	1/12/2006	2/10/2006	29	A1	\$25.46	140	
1876782095	12/13/2005	1/12/2006	30	A1	\$25.52	148	
					2006	\$613.90	3,112
					2007	\$381.84	1,793
					Total	\$995.74	4,905

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity Telemetering Tank Site

Facility Info: Telemetering Tank Site
Address Taylor Rd, Penryn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782100	12/11/2007	1/9/2008	29	A1	\$12.07	31	
1876782100	11/8/2007	12/11/2007	33	A1	\$13.43	35	
1876782100	10/10/2007	11/8/2007	29	A1	\$12.81	30	
1876782100	9/12/2007	10/10/2007	28	A1	\$12.58	28	
1876782100	8/13/2007	9/12/2007	30	A1	\$13.11	28	
1876782100	7/12/2007	8/13/2007	32	A1	\$14.38	32	
1876782100	6/12/2007	7/12/2007	30	A1	\$13.48	30	
1876782100	5/11/2007	6/12/2007	32	A1	\$14.38	32	
1876782100	4/12/2007	5/11/2007	29	A1	\$12.13	29	
1876782100	3/13/2007	4/12/2007	30	A1	\$15.32	55	
1876782100	2/1/2007	3/13/2007	40	A1	\$14.52	29	
1876782100	1/11/2007	2/1/2007	21	A1	\$7.62	15	
1876782100	12/12/2006	1/11/2007	30	A1	\$12.57	34	
1876782100	11/9/2006	12/12/2006	33	A1	\$13.62	36	
1876782100	10/11/2006	11/9/2006	29	A1	\$12.94	31	
1876782100	9/12/2006	10/11/2006	29	A1	\$13.41	31	
1876782100	8/11/2006	9/12/2006	32	A1	\$15.20	37	
1876782100	7/13/2006	8/11/2006	29	A1	\$13.81	34	
1876782100	6/13/2006	7/13/2006	30	A1	\$14.43	36	
1876782100	5/13/2006	6/13/2006	31	A1	\$16.31	45	
1876782100	4/12/2006	5/13/2006	31	A1	\$22.15	92	
1876782100	3/15/2006	4/12/2006	28	A1	\$19.87	96	
1876782100	2/10/2006	3/15/2006	33	A1	\$23.56	116	
1876782100	1/11/2006	2/10/2006	30	A1	\$19.89	94	
1876782100	12/13/2005	1/11/2006	29	A1	\$16.72	78	
					2006	\$185.19	648
					2007	\$156.33	377
					Total	\$341.52	1,025

Group Name: Small Accounts
Activity Telemeter Equip

Facility Info: Telemeter Equipment
Address 9367 Powerhouse Rd, New Castle

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782110	12/11/2007	1/10/2008	30	A1	\$8.28	0	
1876782110	11/9/2007	12/11/2007	32	A1	\$8.52	0	
1876782110	10/11/2007	11/9/2007	29	A1	\$7.72	0	
1876782110	9/12/2007	10/11/2007	29	A1	\$7.72	0	
1876782110	8/14/2007	9/12/2007	29	A1	\$7.90	1	
1876782110	7/13/2007	8/14/2007	32	A1	\$8.52	0	
1876782110	6/14/2007	7/13/2007	29	A1	\$7.72	0	
1876782110	5/14/2007	6/14/2007	31	A1	\$8.25	0	
1876782110	4/13/2007	5/14/2007	31	A1	\$8.25	0	
1876782110	3/14/2007	4/13/2007	30	A1	\$7.98	0	
1876782110	2/12/2007	3/14/2007	30	A1	\$7.99	0	
1876782110	1/11/2007	2/12/2007	32	A1	\$8.52	0	
1876782110	12/13/2006	1/11/2007	29	A1	\$7.72	0	
1876782110	11/10/2006	12/13/2006	33	A1	\$8.78	0	
1876782110	10/12/2006	11/10/2006	29	A1	\$7.72	0	
1876782110	9/13/2006	10/12/2006	29	A1	\$7.72	0	
1876782110	8/15/2006	9/13/2006	29	A1	\$7.72	0	
1876782110	7/17/2006	8/15/2006	29	A1	\$7.72	0	
1876782110	6/14/2006	7/17/2006	33	A1	\$8.78	0	
1876782110	5/15/2006	6/14/2006	30	A1	\$7.98	0	
1876782110	4/14/2006	5/15/2006	31	A1	\$8.25	0	
1876782110	3/16/2006	4/14/2006	29	A1	\$7.72	0	
1876782110	2/13/2006	3/16/2006	31	A1	\$8.37	1	
1876782110	1/12/2006	2/13/2006	32	A1	\$8.52	0	
1876782110	12/15/2005	1/12/2006	28	A1	\$7.02	0	
					2006	\$89.28	1
					2007	\$96.81	1
					Total	\$186.09	2

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Small Accounts

Facility Info: Reg Station

Activity Reg Station

Address Swetzer Rd, Penryn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782120	12/12/2007	1/11/2008	30	A1	\$15.42	54	
1876782120	11/10/2007	12/12/2007	32	A1	\$32.56	181	
1876782120	10/12/2007	11/10/2007	29	A1	\$36.09	171	
1876782120	9/13/2007	10/12/2007	29	A1	\$15.24	41	
1876782120	8/14/2007	9/13/2007	30	A1	\$14.39	35	
1876782120	7/17/2007	8/14/2007	28	A1	\$13.86	35	
1876782120	6/14/2007	7/17/2007	33	A1	\$16.48	42	
1876782120	5/15/2007	6/14/2007	30	A1	\$15.68	42	
1876782120	4/16/2007	5/15/2007	29	A1	\$15.36	48	
1876782120	3/15/2007	4/16/2007	32	A1	\$15.86	55	
1876782120	2/14/2007	3/15/2007	29	A1	\$15.21	56	
1876782120	1/13/2007	2/14/2007	32	A1	\$18.05	71	
1876782120	12/13/2006	1/13/2007	31	A1	\$16.32	60	
1876782120	11/13/2006	12/13/2006	30	A1	\$15.52	56	
1876782120	10/13/2006	11/13/2006	31	A1	\$16.89	53	
1876782120	9/14/2006	10/13/2006	29	A1	\$16.34	47	
1876782120	8/16/2006	9/14/2006	29	A1	\$16.61	49	
1876782120	7/18/2006	8/16/2006	29	A1	\$14.35	37	
1876782120	6/16/2006	7/18/2006	32	A1	\$16.04	42	
1876782120	5/16/2006	6/16/2006	31	A1	\$9.86	9	
1876782120	4/17/2006	5/16/2006	29	A1	\$22.20	92	
1876782120	3/16/2006	4/17/2006	32	A1	\$18.62	78	
1876782120	2/15/2006	3/16/2006	29	A1	\$18.95	88	
1876782120	1/13/2006	2/15/2006	33	A1	\$46.80	300	
1876782120	12/15/2005	1/13/2006	29	A1	\$15.83	70	
					2006	\$212.18	851
					2007	\$225.10	837
					Total	\$437.28	1688

Group Name: Small Accounts

Facility Info: Control

Activity Control

Address Taylor & King Rd, Loomis

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782125	12/12/2007	1/11/2008	30	A1	\$8.31	0	
1876782125	11/10/2007	12/12/2007	32	A1	\$8.52	0	
1876782125	10/12/2007	11/10/2007	29	A1	\$7.72	0	
1876782125	9/13/2007	10/12/2007	29	A1	\$7.72	0	
1876782125	8/14/2007	9/13/2007	30	A1	\$7.98	0	
1876782125	7/16/2007	8/14/2007	29	A1	\$7.72	0	
1876782125	6/15/2007	7/16/2007	31	A1	\$8.25	0	
1876782125	5/15/2007	6/15/2007	31	A1	\$8.25	0	
1876782125	4/13/2007	5/15/2007	32	A1	\$8.51	0	
1876782125	3/16/2007	4/13/2007	28	A1	\$7.45	0	
1876782125	2/13/2007	3/16/2007	31	A1	\$8.25	0	
1876782125	1/12/2007	2/13/2007	32	A1	\$8.52	0	
1876782125	12/13/2006	1/12/2007	30	A1	\$7.98	0	
1876782125	11/13/2006	12/13/2006	30	A1	\$7.98	0	
1876782125	10/14/2006	11/13/2006	30	A1	\$7.98	0	
1876782125	9/14/2006	10/14/2006	30	A1	\$7.98	0	
1876782125	8/16/2006	9/14/2006	29	A1	\$7.72	0	
1876782125	7/17/2006	8/16/2006	30	A1	\$7.98	0	
1876782125	6/16/2006	7/17/2006	31	A1	\$8.25	0	
1876782125	5/17/2006	6/16/2006	30	A1	\$7.98	0	
1876782125	4/15/2006	5/17/2006	32	A1	\$8.51	0	
1876782125	3/16/2006	4/15/2006	30	A1	\$7.98	0	
1876782125	2/14/2006	3/16/2006	30	A1	\$7.99	0	
1876782125	1/16/2006	2/14/2006	29	A1	\$7.72	0	
1876782125	12/15/2005	1/16/2006	32	A1	\$8.09	0	
					2006	\$88.07	0
					2007	\$96.87	0
					Total	\$184.94	0

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

LAIRD PUMP STATION

Group Name: Pump Station
Activity: LAIRD PUMPS

Facility Info: Laird Pump Station (Old Meter)
Address: West Perry #3 Boardman, Larid Pump Loomis

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
1876782130	12/13/2007	1/14/2008	32	AG1B	\$20.99	19
1876782130	11/13/2007	12/13/2007	30	AG1B	\$27.83	80
1876782130	10/15/2007	11/13/2007	29	AG1B	\$26.86	77
1876782130	9/15/2007	10/15/2007	30	AG1B	\$27.85	80
1876782130	8/16/2007	9/15/2007	30	AG1B	\$28.00	81
1876782130	7/18/2007	8/16/2007	29	AG1B	\$27.02	78
1876782130	6/15/2007	7/18/2007	33	AG1B	\$900.30	5,245
1876782130	5/17/2007	6/15/2007	29	AG1B	\$811.42	4,871
1876782130	4/16/2007	5/17/2007	31	AG1B	\$766.72	4,624
1876782130	3/16/2007	4/16/2007	31	AG1B	\$963.50	5,995
1876782130	2/14/2007	3/16/2007	30	AG1B	\$769.31	4,755
1876782130	1/16/2007	2/14/2007	29	AG1B	\$788.01	4,867
1876782130	12/14/2006	1/16/2007	33	AG1B	\$957.50	6,024
1876782130	11/14/2006	12/14/2006	30	AG1B	\$1,001.48	6,352
1876782130	10/16/2006	11/14/2006	29	AG1B	\$752.03	4,457
1876782130	9/18/2006	10/16/2006	28	AG1B	\$1,448.23	9,039
1876782130	8/16/2006	9/18/2006	33	AG1B	\$1,701.62	10,861
1876782130	7/18/2006	8/16/2006	29	AG1B	\$1,406.12	8,937
1876782130	6/19/2006	7/18/2006	29	AG1B	\$1,064.39	6,768
1876782130	5/18/2006	6/19/2006	32	AG1B	\$1,084.26	6,934
1876782130	4/18/2006	5/18/2006	30	AG1B	\$963.47	6,168
1876782130	3/20/2006	4/18/2006	29	AG1B	\$900.18	5,849
1876782130	2/16/2006	3/20/2006	32	AG1B	\$1,021.54	6,789
1876782130	1/17/2006	2/16/2006	30	AG1B	\$801.24	5,276
1876782130	12/16/2005	1/17/2006	32	AG1B	\$902.62	6,231
				2006	\$13,102.06	83,454
				2007	\$6,094.32	36,777
				Total	\$19,196.38	120,231

TURNER PUMP STATION

Group Name: Pump Station
Activity: TURNER PUMPS

Facility Info: Turner Pump Station
Address: 7520 Wayland Rd, Bckyrd,x,frm-canal, Loomis

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
1876782135	12/13/2007	1/14/2008	32	AG5A	\$450.99	4,183
1876782135	11/14/2007	12/13/2007	29	AG5A	\$472.97	4,734
1876782135	10/15/2007	11/14/2007	30	AG5A	\$508.75	4,071
1876782135	9/14/2007	10/15/2007	31	AG5A	\$1,018.75	8,259
1876782135	8/15/2007	9/14/2007	30	AG5A	\$1,425.61	12,173
1876782135	7/17/2007	8/15/2007	29	AG5A	\$1,203.95	9,923
1876782135	6/15/2007	7/17/2007	32	AG5A	\$1,312.95	11,221
1876782135	5/16/2007	6/15/2007	30	AG5A	\$1,286.98	10,859
1876782135	4/16/2007	5/16/2007	30	AG5A	\$1,187.16	11,919
1876782135	3/19/2007	4/16/2007	28	AG5A	\$761.92	9,050
1876782135	2/14/2007	3/19/2007	33	AG5A	\$705.83	8,211
1876782135	1/16/2007	2/14/2007	29	AG5A	\$635.87	7,140
1876782135	12/15/2006	1/16/2007	32	AG5A	\$716.14	8,394
1876782135	11/14/2006	12/15/2006	31	AG5A	\$812.04	9,750
1876782135	10/16/2006	11/14/2006	29	AG5A	\$726.93	6,819
1876782135	9/18/2006	10/16/2006	28	AG5A	\$1,190.13	9,815
1876782135	8/17/2006	9/18/2006	32	AG5A	\$1,314.93	11,554
1876782135	7/18/2006	8/17/2006	30	AG5A	\$1,242.04	10,621
1876782135	6/17/2006	7/18/2006	31	AG5A	\$1,206.38	10,749
1876782135	5/17/2006	6/17/2006	31	AG5A	\$1,166.60	10,012
1876782135	4/18/2006	5/17/2006	29	AG5A	\$955.69	9,387
1876782135	3/17/2006	4/18/2006	32	AG5A	\$759.57	9,574
1876782135	2/16/2006	3/17/2006	29	AG5A	\$700.61	8,805
1876782135	1/17/2006	2/16/2006	30	AG5A	\$769.60	9,876
1876782135	12/17/2005	1/17/2006	31	AG5A	\$749.44	9,698
				2006	\$10,844.52	106,962
				2007	\$11,236.88	105,954
				Total	\$22,081.40	212,916

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Small Accounts

Facility Info: Industrial Ave

Activity Water Tel

Address Industrial Ave, Roseville

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782140	5/19/2006	6/19/2006	31	A1	\$22.59	80	
1876782140	4/19/2006	5/19/2006	30	A1	\$21.24	82	
1876782140	3/21/2006	4/19/2006	29	A1	\$23.97	125	
1876782140	2/17/2006	3/21/2006	32	A1	\$28.46	156	
1876782140	1/18/2006	2/17/2006	30	A1	\$26.61	147	
1876782140	12/16/2005	1/18/2006	33	A1	\$28.31	162	
1876782140	11/18/2005	12/16/2005		A1	\$23.55	140	
					2006	\$122.87	590
					2007	\$0.00	0
					Total	\$151.18	590

Group Name: Small Accounts

Facility Info: Penryn TMT Plant

Activity Penryn TMT Plant

Address CO Adm Center, Penryn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782145	12/17/2007	1/16/2008	30	A1	\$12.62	0	
1876782145	11/15/2007	12/17/2007	32	A1	\$12.62	0	
1876782145	10/17/2007	11/15/2007	29	A1	\$11.43	0	
1876782145	9/19/2007	10/17/2007	28	A1	\$11.04	0	
1876782145	8/17/2007	9/19/2007	33	A1	\$13.01	0	
1876782145	7/20/2007	8/17/2007	28	A1	\$11.04	0	
1876782145	6/19/2007	7/20/2007	31	A1	\$12.23	0	
1876782145	5/18/2007	6/19/2007	32	A1	\$12.62	0	
1876782145	4/19/2007	5/18/2007	29	A1	\$11.44	0	
1876782145	3/20/2007	4/19/2007	30	A1	\$11.83	0	
1876782145	2/16/2007	3/20/2007	32	A1	\$12.62	0	
1876782145	1/18/2007	2/16/2007	29	A1	\$11.43	0	
1876782145	12/18/2006	1/18/2007	31	A1	\$12.23	0	
1876782145	11/16/2006	12/18/2006	32	A1	\$12.62	0	
1876782145	10/19/2006	11/16/2006	28	A1	\$11.04	0	
1876782145	9/20/2006	10/19/2006	29	A1	\$11.43	0	
1876782145	8/18/2006	9/20/2006	33	A1	\$13.02	0	
1876782145	7/21/2006	8/18/2006	28	A1	\$11.04	0	
1876782145	6/21/2006	7/21/2006	30	A1	\$11.83	0	
1876782145	5/20/2006	6/21/2006	32	A1	\$12.62	0	
1876782145	4/21/2006	5/20/2006	29	A1	\$11.44	0	
1876782145	3/22/2006	4/21/2006	30	A1	\$11.83	0	
1876782145	2/17/2006	3/22/2006	33	A1	\$13.01	0	
1876782145	1/19/2006	2/17/2006	29	A1	\$11.43	0	
1876782145	12/20/2005	1/19/2006	30	A1	\$11.39	0	
					2006	\$142.70	0
					2007	\$143.54	0
					Total	\$286.24	0

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity: Water Agency

Facility Info: Water Agency
8159 Blackwood Ln, Roseville

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782150	12/17/2007	1/17/2008	31	A6	\$28.92	80	
1876782150	11/15/2007	12/17/2007	32	A6	\$26.31	64	
1876782150	10/18/2007	11/15/2007	28	A6	\$23.03	56	
1876782150	9/18/2007	10/18/2007	30	A6	\$27.83	80	
1876782150	8/17/2007	9/18/2007	32	A6	\$31.58	80	
1876782150	7/19/2007	8/17/2007	29	A6	\$34.86	79	
1876782150	6/19/2007	7/19/2007	30	A6	\$35.74	81	
1876782150	5/18/2007	6/19/2007	32	A6	\$22.77	40	
1876782150	4/18/2007	5/18/2007	30	A6	\$28.19	80	
1876782150	3/20/2007	4/18/2007	29	A6	\$26.85	80	
1876782150	2/17/2007	3/20/2007	31	A6	\$43.17	200	
1876782150	1/18/2007	2/17/2007	30	A6	\$37.06	160	
1876782150	12/18/2006	1/18/2007	31	A6	\$32.21	120	
1876782150	11/16/2006	12/18/2006	32	A6	\$28.76	80	
1876782150	10/18/2006	11/16/2006	29	A6	\$27.16	80	
1876782150	9/19/2006	10/18/2006	29	A6	\$28.59	60	
1876782150	8/21/2006	9/19/2006	29	A6	\$28.59	60	
1876782150	7/19/2007	8/17/2007	29	A6	\$34.86	79	
1876782150	6/20/2006	7/21/2006	31	A6	\$25.82	80	
1876782150	5/22/2006	6/20/2006	29	A6	\$33.40	80	
1876782150	4/20/2006	5/22/2006	32	A6	\$22.73	40	
1876782150	3/21/2006	4/20/2006	30	A6	\$27.27	81	
1876782150	2/20/2006	3/21/2006	29	A6	\$26.60	79	
1876782150	1/19/2006	2/20/2006	32	A6	\$32.20	120	
1876782150	12/19/2005	1/19/2006	31	A6	\$27.15	80	
					2006	\$343.13	919
					2007	\$369.60	1,120
					Total	\$712.73	2,039

Group Name: Pump Station
Activity: N Star Pump

Facility Info: North Star Pump Station
Address: Sunset Hill, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782165	12/20/2007	1/19/2008	30	A1	\$38.90	200	
1876782165	11/20/2007	12/20/2007	30	A1	\$49.04	280	
1876782165	10/22/2007	11/20/2007	29	A1	\$82.74	480	
1876782165	9/24/2007	10/22/2007	28	A1	\$106.34	520	
1876782165	8/22/2007	9/24/2007	33	A1	\$240.28	1,240	
1876782165	7/25/2007	8/22/2007	28	A1	\$245.64	1,280	
1876782165	6/23/2007	7/25/2007	32	A1	\$261.89	1,360	
1876782165	5/23/2007	6/23/2007	31	A1	\$224.82	1,160	
1876782165	4/23/2007	5/23/2007	30	A1	\$142.27	760	
1876782165	3/23/2007	4/23/2007	31	A1	\$81.54	520	
1876782165	2/23/2007	3/23/2007	28	A1	\$59.10	360	
1876782165	1/23/2007	2/23/2007	31	A1	\$44.45	240	
1876782165	12/21/2006	1/23/2007	33	A1	\$50.62	280	
1876782165	11/21/2006	12/21/2006	30	A1	\$54.89	320	
1876782165	10/24/2006	11/21/2006	28	A1	\$75.62	440	
1876782165	9/23/2006	10/24/2006	31	A1	\$173.69	880	
1876782165	8/23/2006	9/23/2006	31	A1	\$223.77	1,160	
1876782165	7/25/2006	8/23/2006	29	A1	\$240.77	1,280	
1876782165	6/24/2006	7/25/2006	31	A1	\$270.23	1,440	
1876782165	5/25/2006	6/24/2006	30	A1	\$226.84	1,200	
1876782165	4/24/2006	5/25/2006	31	A1	\$148.08	800	
1876782165	3/26/2006	4/24/2006	29	A1	\$37.51	200	
1876782165	2/23/2006	3/26/2006	31	A1	\$53.20	320	
1876782165	1/24/2006	2/23/2006	30	A1	\$42.25	240	
1876782165	12/23/2005	1/24/2006	32	A1	\$42.21	240	
					2006	\$1,589.06	8,520
					2007	\$1,588.73	8,480
					Total	\$3,177.79	17,000

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity RKLN PLT OUTDR LT

Facility Info: Rocklin Plant outdoor Lights
Address Rocklin treatment plant, Groove St Rocklin Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782170	3/6/2006	3/27/2006	21	OL1	\$7.64	20	
1876782170	2/2/2006	3/6/2006	32	OL1	\$10.87	31	
1876782170	1/4/2006	2/2/2006	29	OL1	\$10.86	28	
1876782170	12/5/2005	1/4/2006	30	OL1	\$8.93	29	
					2006	\$29.37	79
					2007	\$0.00	0
					Total	\$38.30	108

Group Name: Small Accounts
Activity Park Water Storage

Facility Info: Park Water Storage
Address ColfaxPark, Colfax

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
1876782269	12/11/2007	1/10/2008	30	A1	\$8.28	0	
1876782269	11/9/2007	12/11/2007	32	A1	\$8.52	0	
1876782269	10/11/2007	11/9/2007	29	A1	\$7.72	0	
1876782269	9/13/2007	10/11/2007	28	A1	\$7.45	0	
1876782269	8/14/2007	9/13/2007	30	A1	\$7.98	0	
1876782269	7/16/2007	8/14/2007	29	A1	\$7.72	0	
1876782269	6/14/2007	7/16/2007	32	A1	\$8.52	0	
1876782269	5/14/2007	6/14/2007	31	A1	\$8.25	0	
1876782269	4/13/2007	5/14/2007	31	A1	\$8.25	0	
1876782269	3/13/2007	4/13/2007	31	A1	\$8.25	0	
1876782269	2/13/2007	3/15/2007	30	A1	\$8.24	2	
1876782269	1/12/2007	2/13/2007	32	A1	\$8.52	0	
1876782269	12/13/2006	1/12/2007	30	A1	\$7.98	0	
1876782269	11/13/2006	12/13/2006	30	A1	\$7.98	0	
1876782269	10/13/2006	11/13/2006	31	A1	\$8.25	0	
1876782269	9/14/2006	10/13/2006	29	A1	\$7.72	0	
1876782269	8/15/2006	9/14/2006	30	A1	\$7.99	0	
1876782269	7/17/2006	8/15/2006	29	A1	\$7.72	0	
1876782269	6/14/2006	7/17/2006	33	A1	\$8.78	0	
1876782269	5/12/2006	6/14/2006	33	A1	\$8.79	0	
1876782269	4/14/2006	5/16/2006	32	A1	\$8.83	2	
1876782269	3/16/2006	4/14/2006	29	A1	\$7.72	0	
1876782269	2/13/2006	3/16/2006	31	A1	\$8.25	0	
1876782269	1/13/2006	2/13/2006	31	A1	\$8.25	0	
1876782269	12/14/2005	1/13/2006	30	A1	\$7.53	0	
					2006	\$90.28	2
					2007	\$97.40	2
					Total	\$187.68	4

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity Residential

Facility Info: Residential
Address

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
2121700434	11/1/2007	12/1/2007	31	E1 SH	\$7.21	63
2121700434	7/5/2007	8/3/2007	30	E1 SH	\$62.76	548
2121700434	6/6/2007	7/4/2007	29	E1 SH	\$58.42	510
2121700434	5/4/2007	6/5/2007	33	E1 SH	\$47.07	411
2121700434	4/4/2007	5/3/2007	30	E1 SH	\$16.26	142
2121700434	3/7/2007	4/3/2007	28	E1 SH	\$4.15	29
2121700434	2/2/2007	3/6/2007	33	E1 SH	\$4.88	0
2121700434	1/4/2007	2/1/2007	29	E1 SH	\$4.29	0
2121700434	12/5/2006	1/3/2007	30	E1 SH	\$4.43	0
2121700434	11/2/2006	12/4/2006	33	E1 SH	\$4.88	2
2121700434	10/5/2006	10/31/2006	28	E1 SH	\$19.59	171
2121700434	9/2/2006	10/4/2006	33	E1 SH	\$68.94	602
2121700434	8/5/2006	8/31/2006	28	E1 SH	\$66.85	580
2121700434	7/6/2006	8/4/2006	30	E1 SH	\$70.54	614
2121700434	6/6/2006	7/5/2006	30	E1 SH	\$38.70	338
2121700434	5/6/2006	6/5/2006	31	E1 SH	\$4.58	0
2121700434	4/6/2006	5/5/2006	30	E1 SH	\$4.44	0
2121700434	3/31/2006	4/5/2006	6	E1 SH	\$0.89	0
				200	\$279.41	2,307
				2007	\$209.47	1,703
				Total	\$488.88	4,010

Group Name: Small Accounts
Activity Residential

Facility Info: Residential
Address

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
2121700822	11/1/2007	12/1/2007	31	E1 SB	\$21.76	190
2121700822	8/4/2007	9/4/2007	32	E1 SB	\$10.06	88
2121700822	7/5/2007	8/3/2007	30	E1 SB	\$146.01	940
2121700822	5/4/2007	6/5/2007	33	E1 SB	\$33.32	291
2121700822	4/4/2007	5/3/2007	30	E1 SB	\$20.73	181
2121700822	3/7/2007	4/3/2007	28	E1 SB	\$21.87	191
2121700822	1/4/2007	2/1/2007	29	E1 SB	\$28.40	248
2121700822	12/5/2006	1/3/2007	30	E1 SB	\$28.87	252
2121700822	11/2/2006	12/4/2006	33	E1 SB	\$29.03	254
2121700822	10/5/2006	10/31/2006	28	E1 SB	\$22.90	200
2121700822	9/2/2006	10/4/2006	33	E1 SB	\$8.48	74
2121700822	8/5/2006	8/31/2006	28	E1 SB	\$6.41	56
2121700822	7/6/2006	8/4/2006	30	E1 SB	\$62.56	538
2121700822	6/6/2006	7/5/2006	30	E1 SB	\$80.48	653
2121700822	5/6/2006	6/5/2006	31	E1 SB	\$30.01	262
2121700822	4/6/2006	5/5/2006	30	E1 SB	\$36.19	316
2121700822	3/29/2006	4/5/2006	8	E1 SB	\$5.15	45
				2006	\$281.21	2,398
				2007	\$311.02	2,381
				Total	\$592.23	4,779

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

North Auburn Pump Station

Group Name: Pump Station

Facility Info: North Auburn Pump Station

Activity: Pump

Address: 13153 Lincoln Way, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
2344496005	6/28/2007	7/19/2007	21	A6	\$9.52	0
2344496005	5/31/2007	6/28/2007	28	A6	\$12.70	0
2344496005	4/30/2007	5/31/2007	31	A6	\$14.05	0
2344496005	3/29/2007	4/30/2007	32	A6	\$14.51	0
2344496005	2/28/2007	3/29/2007	29	A6	\$13.15	0
2344496005	1/29/2007	2/28/2007	30	A6	\$13.60	0
2344496005	12/29/2006	1/29/2007	31	A6	\$14.06	0
2344496005	11/29/2006	12/29/2006	30	A6	\$13.60	0
2344496005	10/30/2006	11/29/2006	30	A6	\$446.29	2,583
2344496005	9/29/2006	10/30/2006	31	A6	\$3,144.44	21,914
2344496005	8/30/2006	9/29/2006	30	A6	\$13.60	0
2344496005	8/1/2006	8/30/2006	29	A6	\$363.26	2,110
2344496005	6/29/2006	8/1/2006	33	A6	\$15.05	1
2344496005	6/1/2006	6/29/2006	28	A6	\$12.70	0
2344496005	5/2/2006	6/1/2006	30	A6	\$13.60	0
2344496005	3/30/2006	5/2/2006	33	A6	\$14.96	0
2344496005	3/1/2006	3/30/2006	29	A6	\$13.15	0
2344496005	1/30/2006	3/1/2006	30	A6	\$13.60	0
2344496005	12/29/2005	1/30/2006	32	A6	\$14.43	0
2344496005	12/1/2005	12/29/2005	29	A6	\$12.01	0
				2006	\$4,078.68	26,608
				2007	\$91.59	0
				Total	\$4,170.27	26,608

Group Name: Admin and Control Accts

Facility Info: Control Building

Activity: Control Building

Address: End Park, Rocklin

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
2393874005	12/19/2007	1/18/2008	30	A1	\$1,276.82	9,697
2393874005	11/19/2007	12/19/2007	30	A1	\$1,071.07	8,001
2393874005	10/19/2007	11/19/2007	31	A1	\$157.12	977
2393874005	9/20/2007	10/19/2007	29	A1	\$161.68	840
2393874005	8/21/2007	9/20/2007	30	A1	\$63.88	305
2393874005	7/24/2007	8/21/2007	28	A1	\$58.40	278
2393874005	6/21/2007	7/24/2007	33	A1	\$71.47	342
2393874005	5/22/2007	6/21/2007	30	A1	\$138.67	713
2393874005	4/20/2007	5/22/2007	32	A1	\$521.40	3,059
2393874005	3/22/2007	4/20/2007	29	A1	\$778.52	5,782
2393874005	2/21/2007	3/22/2007	29	A1	\$581.29	4,295
2393874005	1/19/2007	2/21/2007	33	A1	\$1,052.75	7,774
2393874005	12/19/2006	1/19/2007	31	A1	\$1,261.20	9,323
2393874005	11/20/2006	12/19/2006	29	A1	\$700.70	5,150
2393874005	10/20/2006	11/20/2006	31	A1	\$82.08	486
2393874005	9/22/2006	10/20/2006	28	A1	\$47.45	218
2393874005	8/22/2006	9/22/2006	31	A1	\$72.94	355
2393874005	7/24/2006	8/22/2006	29	A1	\$62.90	308
2393874005	6/22/2006	7/24/2006	32	A1	\$75.71	375
2393874005	5/23/2006	6/22/2006	30	A1	\$127.67	668
2393874005	4/24/2006	5/23/2006	29	A1	\$58.31	299
2393874005	3/24/2006	4/24/2006	31	A1	\$650.56	4,929
2393874005	2/22/2006	3/24/2006	30	A1	\$844.32	6,532
2393874005	1/23/2006	2/22/2006	30	A1	\$339.25	2,614
2393874005	12/21/2005	1/23/2006	33	A1	\$307.60	2,408
				2006	\$3,369.49	24,342
				2007	\$5,917.45	41,689
				Total	\$9,286.94	66,031

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Lincoln Meter - Telemetry and Flowrate for 10MG Tank

Group Name: Admin and Control Accts

Facility Info: Metering Station - Lincoln

Activity: Metering Station

Address: End park Dr, Rocklin

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
2435541005	12/19/2007	1/19/2008	30	A1	\$476.10	3,575	
2435541005	11/19/2007	12/19/2007	30	A1	\$391.18	2,884	
2435541005	10/19/2007	11/19/2007	31	A1	\$33.24	164	
2435541005	9/20/2007	10/19/2007	29	A1	\$130.88	672	
2435541005	8/21/2007	9/20/2007	30	A1	\$138.84	714	
2435541005	7/24/2007	8/21/2007	28	A1	\$34.39	147	
2435541005	6/21/2007	7/24/2007	33	A1	\$59.01	274	
2435541005	5/22/2007	6/21/2007	30	A1	\$45.20	203	
2435541005	4/20/2007	5/22/2007	32	A1	\$210.55	1,205	
2435541005	3/22/2007	4/20/2007	29	A1	\$457.38	3,373	
2435541005	2/21/2007	3/22/2007	29	A1	\$455.62	3,354	
2435541005	1/19/2007	2/21/2007	33	A1	\$461.48	3,371	
2435541005	12/19/2006	1/19/2007	31	A1	\$41.18	245	
2435541005	11/20/2006	12/19/2006	29	A1	\$12.56	36	
2435541005	10/20/2006	11/20/2006	31	A1	\$43.64	233	
2435541005	9/22/2006	10/20/2006	28	A1	\$92.04	461	
2435541005	8/22/2006	9/22/2006	31	A1	\$103.38	522	
2435541005	7/24/2006	8/22/2006	29	A1	\$92.65	474	
2435541005	6/22/2006	7/24/2006	32	A1	\$104.02	533	
2435541005	5/23/2006	6/22/2006	30	A1	\$100.25	515	
2435541005	4/24/2006	5/23/2006	29	A1	\$152.54	856	
2435541005	3/23/2006	4/24/2006	32	A1	\$646.22	4,896	
2435541005	2/22/2006	3/23/2006	29	A1	\$109.37	794	
2435541005	1/23/2006	2/22/2006	30	A1	\$26.10	143	
2435541005	12/21/2005	1/23/2006	33	A1	\$28.51	161	
					2006	\$1,511.28	9,624
					2007	\$2,458.95	16,606
					Total	\$3,970.23	26,230

Group Name: Small Accounts

Facility Info: Com

Activity: Com

Address: 3195 Midas Ave, Rocklin

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
2520169088	12/24/2007	1/24/2008	31	A1	\$8.96	0	
2520169088	11/26/2007	12/24/2007	28	A1	\$7.45	0	
2520169088	10/25/2007	11/26/2007	32	A1	\$9.09	4	
2520169088	9/26/2007	10/25/2007	29	A1	\$9.37	9	
2520169088	8/25/2007	9/26/2007	32	A1	\$11.27	15	
2520169088	7/27/2007	8/25/2007	29	A1	\$11.02	18	
2520169088	6/26/2007	7/27/2007	31	A1	\$11.36	17	
2520169088	5/25/2007	6/26/2007	32	A1	\$11.27	15	
2520169088	4/27/2007	5/25/2007	28	A1	\$9.06	9	
2520169088	3/27/2007	4/27/2007	31	A1	\$8.92	5	
2520169088	2/26/2007	3/27/2007	29	A1	\$8.26	4	
2520169088	1/25/2007	2/26/2007	32	A1	\$8.52	0	
2520169088	12/26/2006	1/25/2007	30	A1	\$7.98	0	
2520169088	11/27/2006	12/26/2006	29	A1	\$7.72	0	
2520169088	10/25/2006	11/27/2006	33	A1	\$9.07	2	
2520169088	9/26/2006	10/25/2006	29	A1	\$9.19	8	
2520169088	8/25/2006	9/26/2006	32	A1	\$11.63	17	
2520169088	7/27/2006	8/25/2006	29	A1	\$10.95	18	
2520169088	6/27/2006	7/27/2006	30	A1	\$11.74	21	
2520169088	5/30/2006	6/27/2006	28	A1	\$8.35	5	
2520169088	4/27/2006	5/30/2006	33	A1	\$8.78	0	
2520169088	3/29/2006	4/27/2006	29	A1	\$7.72	0	
2520169088	2/27/2006	3/29/2006	30	A1	\$7.99	0	
2520169088	1/26/2006	2/27/2006	32	A1	\$8.52	0	
2520169088	12/27/2005	1/26/2006	30	A1	\$7.88	0	
					2006	\$109.54	71
					2007	\$113.57	96
					Total	\$223.11	167

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Water Treatment Plants

Facility Info: Sunset WTP

Activity Altitude valve (2MG Tank at Sunset)

Address 3555 Park Dr, Rocklin

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
2531014005	12/19/2007	1/18/2008	30	A1	\$15.97	57	
2531014005	11/19/2007	12/19/2007	30	A1	\$16.22	62	
2531014005	10/19/2007	11/19/2007	31	A1	\$18.46	67	
2531014005	9/20/2007	10/19/2007	29	A1	\$26.78	104	
2531014005	8/21/2007	9/20/2007	30	A1	\$24.84	92	
2531014005	7/24/2007	8/21/2007	28	A1	\$23.03	85	
2531014005	6/21/2007	7/24/2007	33	A1	\$108.31	543	
2531014005	5/22/2007	6/21/2007	30	A1	\$24.66	91	
2531014005	4/20/2007	5/22/2007	32	A1	\$24.77	97	
2531014005	3/22/2007	4/20/2007	29	A1	\$19.45	88	
2531014005	2/21/2007	3/22/2007	29	A1	\$19.59	89	
2531014005	1/19/2007	2/21/2007	33	A1	\$22.07	99	
2531014005	12/19/2006	1/19/2007	31	A1	\$20.62	92	
2531014005	11/20/2006	12/19/2006	29	A1	\$19.69	89	
2531014005	10/20/2006	11/20/2006	31	A1	\$23.45	100	
2531014005	9/22/2006	10/20/2006	28	A1	\$23.60	88	
2531014005	8/22/2006	9/22/2006	31	A1	\$25.93	97	
2531014005	7/24/2006	8/22/2006	29	A1	\$23.67	89	
2531014005	6/22/2006	7/24/2006	32	A1	\$26.08	98	
2531014005	5/23/2006	6/22/2006	30	A1	\$24.65	93	
2531014005	4/24/2006	5/23/2006	29	A1	\$22.94	90	
2531014005	3/24/2006	4/24/2006	31	A1	\$19.97	90	
2531014005	2/22/2006	3/24/2006	30	A1	\$19.13	87	
2531014005	1/23/2006	2/22/2006	30	A1	\$19.39	90	
2531014005	12/21/2005	1/23/2006	33	A1	\$21.07	101	
					2006	\$269.57	1,112
					2007	\$348.80	1,509
					Total	\$634.34	2,621

Group Name: Small Accounts

Facility Info: Pressure Reducing Station

Activity Pressure Reducing STA

Address between Park Dr & Old Oak Tree Way, Rocklin

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
2716218005	12/18/2007	1/17/2008	30	A1	\$22.25	105	
2716218005	11/16/2007	12/18/2007	32	A1	\$19.68	84	
2716218005	10/18/2007	11/16/2007	29	A1	\$17.36	62	
2716218005	9/19/2007	10/18/2007	29	A1	\$17.80	55	
2716218005	8/20/2007	9/19/2007	30	A1	\$16.41	46	
2716218005	7/21/2007	8/20/2007	30	A1	\$16.23	45	
2716218005	6/21/2007	7/21/2007	30	A1	\$16.80	48	
2716218005	5/21/2007	6/21/2007	31	A1	\$19.43	61	
2716218005	4/20/2007	5/21/2007	31	A1	\$21.12	77	
2716218005	3/21/2007	4/20/2007	30	A1	\$18.38	78	
2716218005	2/20/2007	3/21/2007	29	A1	\$20.27	94	
2716218005	1/19/2007	2/20/2007	32	A1	\$20.61	90	
2716218005	12/19/2006	1/19/2007	31	A1	\$21.28	97	
2716218005	11/18/2006	12/19/2006	31	A1	\$19.28	82	
2716218005	10/19/2006	11/18/2006	30	A1	\$18.93	71	
2716218005	9/20/2006	10/19/2006	29	A1	\$18.91	61	
2716218005	8/21/2006	9/20/2006	30	A1	\$18.91	60	
2716218005	7/21/2006	8/21/2006	31	A1	\$19.54	63	
2716218005	6/22/2006	7/21/2006	29	A1	\$18.11	58	
2716218005	5/22/2006	6/22/2006	31	A1	\$21.51	74	
2716218005	4/21/2006	5/22/2006	31	A1	\$22.94	89	
2716218005	3/23/2006	4/21/2006	29	A1	\$22.57	114	
2716218005	2/18/2006	3/23/2006	33	A1	\$24.13	120	
2716218005	1/22/2006	2/18/2006	27	A1	\$18.97	93	
2716218005	12/20/2005	1/22/2006	33	A1	\$25.95	141	
					2006	\$249.75	1,026
					2007	\$225.37	837
					Total	\$475.12	1,863

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

TEMP AMERICAN RIVER PUMPS

Group Name: Pump Stations
Activity: WWD-Pump

Facility Info: Temporary American River Pump Station
Address: Auburn Dam Site, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
3262603507	11/30/2007	12/31/2007	31	A6	\$18.45	0	
3262603507	10/31/2007	11/30/2007	30	A6	\$17.86	0	
3262603507	9/30/2007	10/31/2007	31	A6	\$18.45	0	
3262603507	8/31/2007	9/30/2007	30	A6	\$271.82	1,691	
3262603507	7/31/2007	8/31/2007	31	A6	\$91,542.24	626,364	
3262603507	7/3/2007	7/31/2007	28	A6	\$90,378.75	630,294	
3262603507	6/4/2007	7/3/2007	29	A6	\$47,990.89	326,580	
3262603507	5/3/2007	6/4/2007	32	A6	\$14,964.01	108,920	
3262603507	4/3/2007	5/3/2007	30	A6	\$17.85	0	
3262603507	3/5/2007	4/3/2007	29	A6	\$17.26	0	
3262603507	2/1/2007	3/5/2007	32	A6	\$19.05	0	
3262603507	1/3/2007	2/1/2007	29	A6	\$17.26	0	
3262603507	12/4/2006	1/3/2007	30	A6	\$17.85	0	
3262603507	11/1/2006	12/4/2006	33	A6	\$14,461.06	122,400	
3262603507	10/3/2006	11/1/2006	29	A6	\$36,133.85	253,200	
3262603507	9/4/2006	10/3/2006	29	A6	\$35,545.21	251,440	
3262603507	8/4/2006	9/4/2006	31	A6	\$8,130.25	80,760	
3262603507	7/5/2006	8/4/2006	30	A6	\$41,350.81	248,840	
3262603507	6/6/2006	7/5/2006	29	A6	\$1,258.75	9,980	
3262603507	5/5/2006	6/6/2006	32	A6	\$19.05	0	
3262603507	4/5/2006	5/5/2006	30	A6	\$17.86	0	
3262603507	3/7/2006	4/5/2006	29	A6	\$17.27	0	
3262603507	2/1/2006	3/7/2006	34	A6	\$20.24	0	
3262603507	1/5/2006	2/1/2006	27	E20P	\$709.65	0	
3262603507	12/5/2005	1/5/2006	31	E20P	\$396.22	0	
					2006	\$137,664.00	966,620
					2007	\$245,273.29	1,693,849
					Total	\$382,937.29	2,660,469

Group Name: Small Accounts
Activity:

Facility Info: unknown
Address: PO Box 6570, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
3440986002	12/18/2007	1/17/2008	30	LS1	\$11.39	29	
3440986002	11/16/2007	12/18/2007	32	LS1	\$11.97	31	
3440986002	10/18/2007	11/16/2007	29	LS1	\$11.97	28	
3440986002	9/19/2007	10/18/2007	29	LS1	\$11.97	28	
3440986002	8/20/2007	9/19/2007	30	LS1	\$11.97	29	
3440986002	7/20/2007	8/20/2007	31	LS1	\$11.97	30	
3440986002	6/20/2007	7/20/2007	30	LS1	\$11.97	29	
3440986002	5/21/2007	6/20/2007	30	LS1	\$11.97	29	
3440986002	4/19/2007	5/21/2007	32	LS1	\$11.98	31	
3440986002	3/21/2007	4/19/2007	29	LS1	\$11.97	28	
3440986002	2/20/2007	3/21/2007	29	LS1	\$12.00	28	
3440986002	1/19/2007	2/20/2007	32	LS1	\$12.05	31	
3440986002	12/19/2006	1/19/2007	31	LS1	\$12.02	30	
3440986002	11/17/2006	12/19/2006	32	LS1	\$11.95	31	
3440986002	10/19/2006	11/17/2006	29	LS1	\$11.95	28	
3440986002	9/20/2006	10/19/2006	29	LS1	\$11.95	28	
3440986002	8/21/2006	9/20/2006	30	LS1	\$11.90	29	
3440986002	7/21/2006	8/21/2006	31	LS1	\$11.80	30	
3440986002	6/21/2006	7/21/2006	30	LS1	\$11.80	29	
3440986002	5/22/2006	6/21/2006	30	LS1	\$11.80	29	
3440986002	4/21/2006	5/22/2006	31	LS1	\$11.80	30	
3440986002	3/22/2006	4/21/2006	30	LS1	\$11.76	29	
3440986002	2/21/2006	3/22/2006	29	LS1	\$11.64	28	
3440986002	1/20/2006	2/21/2006	32	LS1	\$11.60	31	
3440986002	12/20/2005	1/20/2006	31	LS1	\$13.19	30	
					2006	\$143.14	352
					2007	\$143.81	352
					Total	\$286.95	704

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Pump Station
Activity: Pumps

Facility Info: Rock Creek pump Station
Address: Rock Creek, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
3771875005	11/29/2007	12/31/2007	32	A1	\$12.62	0	
3771875005	10/31/2007	11/29/2007	29	A1	\$11.43	0	
3771875005	9/28/2007	10/29/2007	31	A1	\$8,069.21	43,960	
3771875005	8/29/2007	9/28/2007	30	A1	\$11.83	0	
3771875005	8/1/2007	8/29/2007	28	A1	\$11.04	0	
3771875005	6/29/2007	8/1/2007	33	A1	\$13.01	0	
3771875005	6/1/2007	6/29/2007	28	A1	\$11.04	0	
3771875005	5/1/2007	6/1/2007	31	A1	\$12.22	0	
3771875005	3/30/2007	5/1/2007	32	A1	\$12.61	0	
3771875005	3/2/2007	3/30/2007	28	A1	\$11.04	0	
3771875005	1/30/2007	3/2/2007	31	A1	\$12.22	0	
3771875005	12/30/2006	1/30/2007	31	A1	\$12.22	0	
3771875005	11/30/2006	12/30/2006	30	A1	\$11.83	0	
3771875005	10/30/2006	11/30/2006	31	A1	\$1,814.70	13,240	
3771875005	10/2/2006	10/30/2006	28	A1	\$7,299.27	39,720	
3771875005	8/31/2006	10/2/2006	32	A1	\$12.62	0	
3771875005	8/2/2006	8/31/2006	29	A1	\$11.43	0	
3771875005	6/30/2006	8/2/2006	33	A1	\$13.01	0	
3771875005	6/2/2006	6/30/2006	28	A1	\$11.04	0	
3771875005	5/3/2006	6/2/2006	30	A1	\$11.83	0	
3771875005	4/3/2006	5/3/2006	30	A1	\$11.82	0	
3771875005	3/3/2006	4/3/2006	31	A1	\$12.22	0	
3771875005	2/1/2006	3/3/2006	30	A1	\$11.82	0	
3771875005	12/30/2005	2/1/2006	33	A1	\$12.97	0	
					2006	\$9,234.56	52,960
					2007	\$8,200.49	43,960
					Total	\$17,435.05	96,920

Group Name: Pump Station
Activity: HYDRO PUMP

Facility Info: Rock Creek pump Station
Address: 12250 Rock Creek Rd, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
3855209005	11/29/2007	12/31/2007	32	A1	\$12.62	0	
3855209005	10/29/2007	11/29/2007	31	A1	\$2,478.75	18,120	
3855209005	9/28/2007	10/29/2007	31	A1	\$6,089.78	33,160	
3855209005	8/28/2007	9/28/2007	31	A1	\$12.22	0	
3855209005	7/31/2007	8/28/2007	28	A1	\$11.04	0	
3855209005	6/29/2007	7/31/2007	32	A1	\$12.61	0	
3855209005	5/31/2007	6/29/2007	29	A1	\$11.43	0	
3855209005	5/1/2007	5/31/2007	30	A1	\$11.83	0	
3855209005	3/30/2007	5/1/2007	32	A1	\$12.61	0	
3855209005	3/1/2007	3/30/2007	29	A1	\$11.43	0	
3855209005	1/30/2007	3/1/2007	30	A1	\$17.19	40	
3855209005	12/29/2006	1/30/2007	32	A1	\$18.00	40	
3855209005	11/30/2006	12/29/2006	29	A1	\$16.81	40	
3855209005	10/30/2006	11/30/2006	31	A1	\$17.66	40	
3855209005	10/2/2006	10/30/2006	28	A1	\$2,036.77	11,040	
3855209005	8/31/2006	10/2/2006	32	A1	\$12.62	0	
3855209005	8/2/2006	8/31/2006	29	A1	\$11.43	0	
3855209005	6/30/2006	8/2/2006	33	A1	\$13.01	0	
3855209005	6/2/2006	6/30/2006	28	A1	\$11.04	0	
3855209005	5/3/2006	6/2/2006	30	A1	\$11.83	0	
3855209005	4/3/2006	5/3/2006	30	A1	\$11.82	0	
3855209005	3/2/2006	4/3/2006	32	A1	\$22.91	80	
3855209005	1/31/2006	3/2/2006	30	A1	\$11.83	0	
3855209005	12/30/2005	1/31/2006	32	A1	\$17.62	40	
					2006	\$2,195.35	11,240
					2007	\$8,699.51	51,360
					Total	\$10,894.86	62,600

Appendix A
 Pacific Gas and Electric
 Detailed Electricity Use Calculations

Group Name: Small Accounts
 Activity

Facility Info: Unknown
 Address Po Box 667, Foresthill

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
3888929005	12/17/2007	1/16/2008	30	OL1	\$10.51	29
3888929005	11/15/2007	12/17/2007	32	OL1	\$11.24	31
3888929005	10/17/2007	11/15/2007	29	OL1	\$11.24	28
3888929005	9/18/2007	10/17/2007	29	OL1	\$11.24	28
3888929005	8/17/2007	9/18/2007	32	OL1	\$11.24	31
3888929005	7/19/2007	8/17/2007	29	OL1	\$11.24	28
3888929005	6/19/2007	7/19/2007	30	OL1	\$11.24	29
3888929005	5/18/2007	6/19/2007	32	OL1	\$11.24	31
3888929005	4/18/2007	5/18/2007	30	OL1	\$11.24	29
3888929005	3/20/2007	4/18/2007	29	OL1	\$11.24	28
3888929005	2/16/2007	3/20/2007	32	OL1	\$11.27	31
3888929005	1/18/2007	2/16/2007	29	OL1	\$11.32	28
3888929005	12/18/2006	1/18/2007	31	OL1	\$11.27	30
3888929005	11/16/2006	12/18/2006	32	OL1	\$11.21	31
3888929005	10/18/2006	11/16/2006	29	OL1	\$11.20	28
3888929005	9/19/2006	10/18/2006	29	OL1	\$11.21	28
3888929005	8/18/2006	9/19/2006	32	OL1	\$11.14	31
3888929005	7/20/2006	8/18/2006	29	OL1	\$11.06	28
3888929005	6/20/2006	7/20/2006	30	OL1	\$11.06	29
3888929005	5/19/2006	6/20/2006	32	OL1	\$11.06	31
3888929005	4/19/2006	5/19/2006	30	OL1	\$11.05	29
3888929005	3/21/2006	4/19/2006	29	OL1	\$11.00	28
3888929005	2/17/2006	3/21/2006	32	OL1	\$10.89	31
3888929005	1/19/2006	2/17/2006	29	OL1	\$10.86	28
3888929005	12/19/2005	1/19/2006	31	OL1	\$9.99	30
				2006	\$131.73	352
				2007	\$135.02	352
				Total	\$266.75	704

Group Name: Small Accounts
 Activity Business OFC

Facility Info: Storage Tank
 Address 5779 Rocklin Rd #A, Rocklin

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
4060532005	12/19/2007	1/19/2008	31	A1	\$13.13	33
4060532005	11/19/2007	12/19/2007	30	A1	\$12.24	32
4060532005	10/19/2007	11/19/2007	31	A1	\$13.13	32
4060532005	9/20/2007	10/19/2007	29	A1	\$13.40	31
4060532005	8/21/2007	9/20/2007	30	A1	\$13.47	30
4060532005	7/24/2007	8/21/2007	28	A1	\$12.76	29
4060532005	6/22/2007	7/24/2007	32	A1	\$14.39	32
4060532005	5/22/2007	6/22/2007	31	A1	\$14.12	32
4060532005	4/20/2007	5/22/2007	32	A1	\$13.88	32
4060532005	3/22/2007	4/20/2007	29	A1	\$11.72	30
4060532005	2/21/2007	3/22/2007	29	A1	\$11.72	30
4060532005	1/22/2007	2/21/2007	30	A1	\$12.01	30
4060532005	12/20/2006	1/22/2007	33	A1	\$13.35	34
4060532005	11/20/2006	12/20/2006	30	A1	\$12.15	31
4060532005	10/20/2006	11/20/2006	31	A1	\$12.96	31
4060532005	9/22/2006	10/20/2006	28	A1	\$23.05	85
4060532005	8/22/2006	9/22/2006	31	A1	\$17.90	53
4060532005	7/25/2006	8/22/2006	28	A1	\$14.80	41
4060532005	6/23/2006	7/25/2006	32	A1	\$15.87	41
4060532005	5/24/2006	6/23/2006	30	A1	\$15.50	42
4060532005	4/24/2006	5/24/2006	30	A1	\$13.58	33
4060532005	3/24/2006	4/24/2006	31	A1	\$12.67	34
4060532005	2/22/2006	3/24/2006	30	A1	\$12.34	34
4060532005	1/23/2006	2/22/2006	30	A1	\$12.16	33
4060532005	12/21/2005	1/23/2006	33	A1	\$13.12	37
				2006	\$176.10	495
				2007	\$156.19	374
				Total	\$332.29	869

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Admin and Control Accts
Activity: VACANT

Facility Info: 13448 Lincoln Way
Address: 13348 Lincoln Way, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
4231437593	12/1/2007	1/2/2008	32	A1	\$126.53	858
4231437593	10/31/2007	12/1/2007	31	A1	\$115.99	781
4231437593	10/2/2007	10/31/2007	29	A1	\$156.23	790
4231437593	9/4/2007	10/2/2007	28	A1	\$182.04	933
4231437593	8/3/2007	9/4/2007	32	A1	\$338.67	1,779
4231437593	7/4/2007	8/3/2007	30	A1	\$379.86	2,008
4231437593	6/5/2007	7/4/2007	29	A1	\$296.63	1,556
4231437593	5/3/2007	6/5/2007	33	A1	\$226.16	1,163
4231437593	4/3/2007	5/3/2007	30	A1	\$145.43	966
4231437593	3/6/2007	4/3/2007	28	A1	\$117.96	802
4231437593	2/1/2007	3/6/2007	33	A1	\$138.41	935
4231437593	1/3/2007	2/1/2007	29	A1	\$143.04	980
4231437593	12/4/2006	1/3/2007	30	A1	\$132.24	895
4231437593	11/1/2006	12/4/2006	33	A1	\$136.80	920
4231437593	10/4/2006	11/1/2006	28	A1	\$161.69	829
4231437593	9/1/2006	10/4/2006	33	A1	\$297.97	1,553
4231437593	8/4/2006	9/1/2006	28	A1	\$333.45	1,798
4231437593	7/5/2006	8/4/2006	30	A1	\$449.90	2,445
4231437593	6/5/2006	7/5/2006	30	A1	\$383.43	2,074
4231437593	5/5/2006	6/5/2006	31	A1	\$303.55	1,626
4231437593	4/5/2006	5/5/2006	30	A1	\$203.28	1,378
4231437593	3/7/2006	4/5/2006	29	A1	\$170.48	1,235
4231437593	2/3/2006	3/7/2006	32	A1	\$181.78	1,331
4231437593	1/5/2006	2/3/2006	29	A1	\$143.74	1,044
4231437593	12/5/2005	1/5/2006	31	A1	\$128.91	983
				2006	\$2,766.07	16,233
				2007	\$2,372.66	13,588
				Total	\$5,138.73	29,821

Group Name: Small Accounts
Activity: Pressure Reducing STA

Facility Info: Pressure Reducing Station
Address: Rawhide Rd s/o Rawhide CT, Rocklin

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
4278716005	12/18/2007	1/18/2008	31	A1	\$12.05	25
4278716005	11/16/2007	12/18/2007	32	A1	\$11.98	26
4278716005	10/18/2007	11/16/2007	29	A1	\$11.61	25
4278716005	9/19/2007	10/18/2007	29	A1	\$12.49	26
4278716005	8/20/2007	9/19/2007	30	A1	\$13.84	32
4278716005	7/23/2007	8/20/2007	28	A1	\$12.94	30
4278716005	6/20/2007	7/23/2007	33	A1	\$15.38	36
4278716005	5/21/2007	6/20/2007	30	A1	\$13.48	30
4278716005	4/19/2007	5/21/2007	32	A1	\$13.51	30
4278716005	3/21/2007	4/19/2007	29	A1	\$10.92	24
4278716005	2/20/2007	3/21/2007	29	A1	\$11.05	25
4278716005	1/19/2007	2/20/2007	32	A1	\$11.87	25
4278716005	12/19/2006	1/19/2007	31	A1	\$11.47	24
4278716005	11/17/2006	12/19/2006	32	A1	\$11.88	25
4278716005	10/19/2006	11/17/2006	29	A1	\$11.57	25
4278716005	9/20/2006	10/19/2006	29	A1	\$12.49	26
4278716005	8/21/2006	9/20/2006	30	A1	\$13.82	32
4278716005	7/24/2006	8/21/2006	28	A1	\$13.01	31
4278716005	6/22/2006	7/24/2006	32	A1	\$15.33	38
4278716005	5/23/2006	6/22/2006	30	A1	\$13.54	31
4278716005	4/21/2006	5/23/2006	32	A1	\$13.65	31
4278716005	3/23/2006	4/21/2006	29	A1	\$10.72	23
4278716005	2/21/2006	3/23/2006	30	A1	\$11.05	24
4278716005	1/20/2006	2/21/2006	32	A1	\$11.82	26
4278716005	12/20/2005	1/20/2006	31	A1	\$10.92	24
				2006	\$149.80	336
				2007	\$150.54	333
				Total	\$300.34	669

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Stoneridge Pump Station

Group Name: Pump Station
Activity: Stoneridge pmp Station

Facility Info: Stoneridge Pump Station
Address: 1201 Scarborough Rd W. End, Rocklin, CA

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
4970553835	12/1/2007	12/31/2007		A10sX - A10X	estimated use	7360
4970553835	10/27/2007	11/27/2007	32	A10sX - A10X	\$1,323.31	8480
4970553835	8/28/2007	9/27/2007		A10sX - A10X	\$5,177.41	20480
4970553835	7/28/2007	8/24/2007	31	A10sX - A10X	\$6,645.62	29600
4970553835	7/1/2007	7/27/2007	30	A10sX - A10X	\$6,372.40	30400
4970553835	6/29/2007	6/30/2007	29	A10sX - A10X	\$472.00	800
4970553835	5/31/2007	6/28/2007	29	A10sX - A10X	\$6,550.43	29600
4970553835	5/1/2007	5/30/2007		A10sX - A10X	\$4,592.00	17600
4970553835	3/30/2007	4/30/2007		A10sX - A10X	\$1,909.66	10080
4970553835	3/1/2007	3/29/2007		A10sX - A10X	\$6,283.00	7840
4970553835	1/27/2007	2/28/2007		A10sX - A10X	\$971.67	8480
4970553835	1/1/2007	1/31/2007		A10sX - A10X	estimated use	8480
4970553835	11/28/2006	12/31/2006		A10sX - A10X	\$857.03	7360
4970553835	11/2/2006	11/29/2006		A10sX - A10X	\$830.12	7200
4970553835	10/27/2006	10/31/2006		A10sX - A10X	\$693.10	2080
4970553835	9/29/2006	10/26/2006		A10sX - A10X	\$2,825.00	10560
4970553835	8/29/2006	8/31/2006		A10sX - A10X	\$4,978.00	19360
4970553835	7/29/2006	8/28/2006		A10sX - A10X	\$6,520.10	28000
4970553835	6/19/2006	7/28/2006		A10sX - A10X	\$6,793.51	31400
4970553835	6/1/2006	6/18/2006		A10sX - A10X	\$6,047.65	21440
4970553835	5/1/2006	5/31/2006		A10sX - A10X	\$4,708.19	16000
4970553835	4/1/2006	4/30/2006		A10sX - A10X	\$1,083.15	9120
4970553835	3/1/2006	3/31/2006		A10sX - A10X	estimated use	7840
4970553835	2/1/2006	2/28/2006		A10sX - A10X	estimated use	8480
4970553835	1/1/2006	1/31/2006		A10sX - A10X	estimated use	8480
				2006	\$35,335.85	177320
				2007	\$40,297.50	179,200
				Total	\$75,633.35	349,160

Group Name: Small Accounts

Facility Info: RTU Transmission
Address: MIDAS AVE-CLOVER VLY, ROCKLIN

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
4468141005	12/24/2007	1/24/2008	31	A1	\$8.96	0
4468141005	11/26/2007	12/24/2007	28	A1	\$7.45	0
4468141005	10/25/2007	11/26/2007	32	A1	\$8.52	0
4468141005	9/26/2007	10/25/2007	29	A1	\$7.72	0
4468141005	8/25/2007	9/26/2007	32	A1	\$8.52	0
4468141005	7/27/2007	8/25/2007	29	A1	\$7.72	0
4468141005	6/26/2007	7/27/2007	31	A1	\$8.25	0
4468141005	5/25/2007	6/26/2007	32	A1	\$8.52	0
4468141005	4/27/2007	5/25/2007	28	A1	\$7.45	0
4468141005	3/27/2007	4/27/2007	31	A1	\$8.25	0
4468141005	2/26/2007	3/27/2007	29	A1	\$7.72	0
4468141005	1/25/2007	2/26/2007	32	A1	\$8.52	0
4468141005	12/26/2006	1/25/2007	30	A1	\$7.98	0
4468141005	11/27/2006	12/26/2006	29	A1	\$7.72	0
4468141005	10/25/2006	11/27/2006	33	A1	\$8.79	0
4468141005	9/26/2006	10/25/2006	29	A1	\$7.72	0
4468141005	8/25/2006	9/26/2006	32	A1	\$8.52	0
4468141005	7/27/2006	8/25/2006	29	A1	\$7.72	0
4468141005	6/27/2006	7/27/2006	30	A1	\$8.16	1
4468141005	5/30/2006	6/27/2006	28	A1	\$11.21	21
4468141005	4/27/2006	5/30/2006	33	A1	\$23.46	84
4468141005	3/29/2006	4/27/2006	29	A1	\$21.44	105
4468141005	2/27/2006	3/29/2006	30	A1	\$21.72	107
4468141005	1/26/2006	2/27/2006	32	A1	\$23.09	115
4468141005	12/27/2005	1/26/2006	30	A1	\$21.45	108
				2006	\$171.00	541
				2007	\$96.62	0
				Total	\$267.62	541

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Pump Station **Facility Info:** Laird Pump Station (New Meter)
Activity: Pump Station **Address:** 5398 Laird Rd, Loomis

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
5072809910	12/13/2007	1/14/2008	32	A1	\$762.58	5,704	
5072809910	11/13/2007	12/13/2007	30	A1	\$705.41	5,220	
5072809910	10/15/2007	11/13/2007	29	A1	\$478.86	2,909	
5072809910	9/15/2007	10/15/2007	30	A1	\$1,377.81	7,453	
5072809910	8/16/2007	9/15/2007	30	A1	\$1,444.16	7,815	
5072809910	7/18/2007	8/16/2007	29	A1	\$1,324.63	7,165	
5072809910	6/15/2007	7/18/2007	33	A1	\$753.28	4,039	
5072809910	5/17/2007	6/15/2007	29	A1	\$593.35	3,175	
5072809910	4/16/2007	5/17/2007	31	A1	\$206.53	1,209	
5072809910	3/16/2007	4/16/2007	31	A1	\$47.95	268	
5072809910	2/22/2007	3/16/2007	22	A1	\$15.23	49	
					2006	\$0.00	0
					2007	\$7,709.79	45,006
					Total	\$7,709.79	45,006

NEW Permanent AMERICAN RIVER PUMP STATION

Group Name: Pump Station **Facility Info:** Permanent American River Pumpstation
Activity: AMERICAN RIVER PUMP STATION **Address:** 471 Maidu Dr, American Canyon

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
5207317593	12/3/2007	1/2/2008	30	E19PV	\$9,408.38	22,345	
5207317593	10/31/2007	12/3/2007	33	E19PV	\$58,219.06	655,200	
5207317593	10/2/2007	10/31/2007	29	E19PV	\$76,185.08	525,600	
5207317593	9/4/2007	10/2/2007	28	E19PV	\$3,110.48	14,400	
5207317593	8/3/2007	9/4/2007	32	E19PV	\$103.93	0	
5207317593	7/3/2007	8/3/2007	31	E19PV	\$100.68	0	
5207317593	6/4/2007	7/3/2007	29	E19SV	\$94.18	0	
5207317593	5/3/2007	6/4/2007	32	E19SV	\$103.93	0	
5207317593	4/3/2007	5/3/2007	30	E19SV	\$97.43	0	
5207317593	3/5/2007	4/3/2007	29	E19SV	\$94.18	0	
5207317593	2/1/2007	3/5/2007	32	E19SV	\$107.08	0	
5207317593	1/10/2007	2/1/2007	22	E19SV	\$74.02	0	
5207317593	11/27/2006	1/10/2007	44	E19SV	\$143.45	0	
					2006	\$143.45	0
					2007	\$147,698.43	1,217,545
					Total	\$147,841.88	1,217,545

Appendix A
 Pacific Gas and Electric
 Detailed Electricity Use Calculations

Group Name: Small Accounts

Facility Info: Stanford Ranch Water Tank

Activity Water Tank

Address Stanford Ranch Water tank, Rocklin

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
5528715005	12/18/2007	1/17/2008	30	A1	\$8.49	0	
5528715005	11/16/2007	12/18/2007	32	A1	\$8.52	0	
5528715005	10/18/2007	11/16/2007	29	A1	\$8.03	2	
5528715005	9/19/2007	10/18/2007	29	A1	\$9.37	9	
5528715005	8/20/2007	9/19/2007	30	A1	\$9.63	9	
5528715005	7/21/2007	8/20/2007	30	A1	\$9.63	9	
5528715005	6/21/2007	7/21/2007	30	A1	\$9.64	9	
5528715005	5/21/2007	6/21/2007	31	A1	\$10.09	10	
5528715005	4/20/2007	5/21/2007	31	A1	\$9.76	9	
5528715005	3/21/2007	4/20/2007	30	A1	\$9.18	9	
5528715005	2/20/2007	3/21/2007	29	A1	\$8.93	9	
5528715005	1/19/2007	2/20/2007	32	A1	\$9.87	10	
5528715005	12/19/2006	1/19/2007	31	A1	\$9.60	10	
5528715005	11/18/2006	12/19/2006	31	A1	\$9.47	9	
5528715005	10/19/2006	11/18/2006	30	A1	\$9.37	9	
5528715005	9/20/2006	10/19/2006	29	A1	\$9.37	9	
5528715005	8/21/2006	9/20/2006	30	A1	\$9.80	10	
5528715005	7/21/2006	8/21/2006	31	A1	\$9.86	9	
5528715005	6/22/2006	7/21/2006	29	A1	\$9.33	9	
5528715005	5/22/2006	6/22/2006	31	A1	\$9.86	9	
5528715005	4/21/2006	5/22/2006	31	A1	\$9.74	9	
5528715005	3/23/2006	4/21/2006	29	A1	\$8.90	9	
5528715005	2/18/2006	3/23/2006	33	A1	\$10.07	10	
5528715005	1/22/2006	2/18/2006	27	A1	\$8.33	9	
5528715005	12/20/2005	1/22/2006	33	A1	\$9.73	10	
					2006	\$113.83	111
					2007	\$112.25	95
					Total	\$226.08	206

Activity

Address 2581 Shirland Tract Rd, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
5778844493	12/11/2007	1/10/2008	30	A1	\$17.11	67	
5778844493	11/9/2007	12/11/2007	32	A1	\$13.84	40	
5778844493	10/11/2007	11/9/2007	29	A1	\$13.26	33	
5778844493	9/13/2007	10/11/2007	28	A1	\$13.31	32	
5778844493	8/13/2007	9/13/2007	31	A1	\$16.68	46	
5778844493	7/14/2007	8/13/2007	30	A1	\$16.41	46	
5778844493	6/14/2007	7/14/2007	30	A1	\$16.61	47	
5778844493	5/15/2007	6/14/2007	30	A1	\$15.87	43	
5778844493	4/12/2007	5/15/2007	33	A1	\$15.18	41	
5778844493	3/15/2007	4/12/2007	28	A1	\$11.72	32	
5778844493	2/13/2007	3/15/2007	30	A1	\$13.60	42	
5778844493	1/11/2007	2/13/2007	33	A1	\$18.98	76	
5778844493	12/12/2006	1/11/2007	30	A1	\$17.81	73	
5778844493	11/10/2006	12/12/2006	32	A1	\$12.29	28	
5778844493	10/12/2006	11/10/2006	29	A1	\$8.56	5	
5778844493	9/13/2006	10/12/2006	29	A1	\$14.14	35	
5778844493	8/14/2006	9/13/2006	30	A1	\$15.76	43	
5778844493	7/15/2006	8/14/2006	30	A1	\$16.58	48	
5778844493	6/15/2006	7/15/2006	30	A1	\$16.04	45	
5778844493	5/16/2006	6/15/2006	30	A1	\$14.43	36	
5778844493	4/14/2006	5/16/2006	32	A1	\$13.80	34	
5778844493	3/15/2006	4/14/2006	30	A1	\$12.39	34	
5778844493	2/13/2006	3/15/2006	30	A1	\$12.19	33	
5778844493	1/12/2006	2/13/2006	32	A1	\$13.08	36	
5778844493	12/14/2005	1/12/2006	29	A1	\$11.40	34	
					2006	\$149.26	377
					2007	\$183.27	551
					Total	\$332.53	928

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity Pressure Reducing STA

Facility Info: Pressure Reducing Station - Colfax
Address 101 Park Hill Dr, Colfax

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
6099667005	12/11/2007	1/10/2008	30	A1	\$18.29	76	
6099667005	11/9/2007	12/11/2007	32	A1	\$14.10	42	
6099667005	10/11/2007	11/9/2007	29	A1	\$12.41	28	
6099667005	9/13/2007	10/11/2007	28	A1	\$12.58	28	
6099667005	8/14/2007	9/13/2007	30	A1	\$14.39	35	
6099667005	7/16/2007	8/14/2007	29	A1	\$13.95	34	
6099667005	6/14/2007	7/16/2007	32	A1	\$15.32	37	
6099667005	5/14/2007	6/14/2007	31	A1	\$14.49	34	
6099667005	4/13/2007	5/14/2007	31	A1	\$13.71	35	
6099667005	3/15/2007	4/13/2007	29	A1	\$11.99	32	
6099667005	2/13/2007	3/15/2007	30	A1	\$16.15	61	
6099667005	1/12/2007	2/13/2007	32	A1	\$17.65	68	
6099667005	12/13/2006	1/12/2007	30	A1	\$16.04	60	
6099667005	11/13/2006	12/13/2006	30	A1	\$13.76	43	
6099667005	10/13/2006	11/13/2006	31	A1	\$13.47	32	
6099667005	9/14/2006	10/13/2006	29	A1	\$13.41	31	
6099667005	8/15/2006	9/14/2006	30	A1	\$14.34	35	
6099667005	7/17/2006	8/15/2006	29	A1	\$14.35	37	
6099667005	6/14/2006	7/17/2006	33	A1	\$15.94	40	
6099667005	5/16/2006	6/14/2006	29	A1	\$13.28	31	
6099667005	4/14/2006	5/16/2006	32	A1	\$14.72	40	
6099667005	3/16/2006	4/14/2006	29	A1	\$17.05	72	
6099667005	2/13/2006	3/16/2006	31	A1	\$19.48	88	
6099667005	1/13/2006	2/13/2006	31	A1	\$15.35	56	
6099667005	12/14/2005	1/13/2006	30	A1	\$17.53	82	
					2006	\$165.15	505
					2007	\$172.78	494
					Total	\$337.93	999

Group Name: Small Accounts
Activity

Facility Info: Unknown
Address Po Box 6570, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
6315986002	12/18/2007	1/17/2008	30	LS1	\$12.80	41	
6315986002	11/16/2007	12/18/2007	32	LS1	\$13.48	44	
6315986002	10/18/2007	11/16/2007	29	LS1	\$13.47	40	
6315986002	9/19/2007	10/18/2007	29	LS1	\$13.48	40	
6315986002	8/20/2007	9/19/2007	30	LS1	\$13.48	41	
6315986002	7/20/2007	8/20/2007	31	LS1	\$13.48	42	
6315986002	6/20/2007	7/20/2007	30	LS1	\$13.47	41	
6315986002	5/21/2007	6/20/2007	30	LS1	\$13.47	41	
6315986002	4/19/2007	5/21/2007	32	LS1	\$13.47	44	
6315986002	3/21/2007	4/19/2007	29	LS1	\$13.48	40	
6315986002	2/20/2007	3/21/2007	29	LS1	\$13.51	40	
6315986002	1/19/2007	2/20/2007	32	LS1	\$13.59	44	
6315986002	12/19/2006	1/19/2007	31	LS1	\$13.53	42	
6315986002	11/17/2006	12/19/2006	32	LS1	\$13.45	44	
6315986002	10/19/2006	11/17/2006	29	LS1	\$13.44	40	
6315986002	9/20/2006	10/19/2006	29	LS1	\$13.45	40	
6315986002	8/21/2006	9/20/2006	30	LS1	\$13.37	41	
6315986002	7/21/2006	8/21/2006	31	LS1	\$13.23	42	
6315986002	6/21/2006	7/21/2006	30	LS1	\$13.23	41	
6315986002	5/22/2006	6/21/2006	30	LS1	\$13.23	41	
6315986002	4/21/2006	5/22/2006	31	LS1	\$13.23	42	
6315986002	3/22/2006	4/21/2006	30	LS1	\$13.17	41	
6315986002	2/21/2006	3/22/2006	29	LS1	\$13.01	40	
6315986002	1/20/2006	2/21/2006	32	LS1	\$12.95	44	
6315986002	12/20/2005	1/20/2006	31	LS1	\$14.58	42	
					2006	\$160.34	498
					2007	\$161.91	499
					Total	\$322.25	997

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity Pressure Reducing Station

Facility Info: Pressure Reducing Station
Address Whitney Ranch PKWY & Spring reek WY, Rocklin

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
6344995762	12/29/2007	1/29/2008	31	A1	\$19.87	83	
6344995762	11/30/2007	12/29/2007	29	A1	\$18.09	78	
6344995762	10/30/2007	11/30/2007	31	A1	\$19.01	80	
6344995762	9/27/2007	10/30/2007	33	A1	\$23.45	80	
6344995762	8/29/2007	9/27/2007	29	A1	\$19.09	62	
6344995762	8/1/2007	8/29/2007	28	A1	\$18.63	61	
6344995762	6/30/2007	8/1/2007	32	A1	\$21.16	69	
6344995762	5/31/2007	6/30/2007	30	A1	\$19.71	64	
6344995762	5/1/2007	5/31/2007	30	A1	\$20.62	69	
6344995762	3/31/2007	5/1/2007	31	A1	\$18.51	76	
6344995762	3/15/2007	3/31/2007	16	A1	\$11.73	56	
					2006	\$0.00	0
					2007	\$190.00	695
					Total	\$190.00	695

Group Name: Small Accounts
Activity

Facility Info: 1081 Ophir Drive
Address 10681 Ophir Dr, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
6370377049	12/18/2007	1/17/2008	30	OL1	\$10.47	29	
6370377049	11/16/2007	12/18/2007	32	OL1	\$11.24	31	
6370377049	10/18/2007	11/16/2007	29	OL1	\$11.24	28	
6370377049	9/19/2007	10/18/2007	29	OL1	\$11.24	28	
6370377049	8/20/2007	9/19/2007	30	OL1	\$11.24	29	
6370377049	7/20/2007	8/20/2007	31	OL1	\$11.24	30	
6370377049	6/20/2007	7/20/2007	30	OL1	\$11.24	29	
6370377049	5/21/2007	6/20/2007	30	OL1	\$11.24	29	
6370377049	4/19/2007	5/21/2007	32	OL1	\$11.24	31	
6370377049	3/21/2007	4/19/2007	29	OL1	\$11.24	28	
6370377049	2/20/2007	3/21/2007	29	OL1	\$11.26	28	
6370377049	1/19/2007	2/20/2007	32	OL1	\$11.32	31	
6370377049	12/19/2006	1/19/2007	31	OL1	\$11.28	30	
6370377049	11/17/2006	12/19/2006	32	OL1	\$11.21	31	
6370377049	10/19/2006	11/17/2006	29	OL1	\$11.21	28	
6370377049	9/20/2006	10/19/2006	29	OL1	\$11.21	28	
6370377049	8/21/2006	9/20/2006	30	OL1	\$11.16	29	
6370377049	7/21/2006	8/21/2006	31	OL1	\$11.06	30	
6370377049	6/21/2006	7/21/2006	30	OL1	\$11.06	29	
6370377049	5/22/2006	6/21/2006	30	OL1	\$11.06	29	
6370377049	4/21/2006	5/22/2006	31	OL1	\$11.06	30	
6370377049	3/8/2006	4/21/2006	44	OL1	\$16.10	43	
6370377049	2/6/2006	3/8/2006	30	OL1	\$10.87	29	
6370377049	1/6/2006	2/6/2006	31	OL1	\$10.86	30	
6370377049	12/7/2005	1/6/2006	30	OL1	\$9.07	29	
					2006	\$126.86	336
					2007	\$135.02	352
					Total	\$261.88	688

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Water Treatment Plant **Facility Info:** Bowman WTP
Activity: Bowman WATER TREATMENT PLANT **Address:**

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
6517432433	12/1/2007	1/2/2008	32	A6	\$2,834.94	24,680
6517432433	11/1/2007	12/1/2007	30	A6	\$2,248.48	19,440
6517432433	10/2/2007	11/1/2007	30	A6	\$2,280.33	15,120
6517432433	8/30/2007	10/2/2007	33	A6	\$3,054.88	21,920
6517432433	8/3/2007	8/30/2007	27	A6	\$4,237.49	28,040
6517432433	7/3/2007	8/3/2007	31	A6	\$2,980.21	20,760
6517432433	6/5/2007	7/3/2007	28	A6	\$5,750.38	37,960
6517432433	5/3/2007	6/5/2007	33	A6	\$4,872.80	33,400
6517432433	4/4/2007	5/3/2007	29	A6	\$3,389.38	28,040
6517432433	3/6/2007	4/4/2007	29	A6	\$3,017.18	25,720
6517432433	2/2/2007	3/6/2007	32	A6	\$3,801.09	32,760
6517432433	1/4/2007	2/2/2007	29	A6	\$3,176.20	27,200
6517432433	12/4/2006	1/4/2007	31	A6	\$2,798.45	23,840
6517432433	11/1/2006	12/4/2006	33	A6	\$2,850.41	24,080
6517432433	10/4/2006	11/1/2006	28	A6	\$2,781.23	18,280
6517432433	9/1/2006	10/4/2006	33	A6	\$4,746.67	32,360
6517432433	8/4/2006	9/1/2006	28	A6	\$4,327.22	29,080
6517432433	7/5/2006	8/4/2006	30	A6	\$4,807.35	32,040
6517432433	6/5/2006	7/5/2006	30	A6	\$6,053.23	40,640
6517432433	5/4/2006	6/5/2006	32	A6	\$2,884.80	20,360
6517432433	4/5/2006	5/4/2006	29	A6	\$3,213.01	26,000
6517432433	3/7/2006	4/5/2006	29	A6	\$3,232.64	27,840
6517432433	2/3/2006	3/7/2006	32	A6	\$2,948.96	25,960
6517432433	1/5/2006	2/3/2006	29	A6	\$2,484.90	21,760
6517432433	12/5/2005	1/5/2006	31	A6	\$2,332.76	21,240
Bowman Electrical Consumption				2006	\$40,330.42	298,400
				2007	\$41,606.87	314,200
				Total	\$81,937.29	612,600

Group Name: Pump Station **Facility Info:** Sunset Pump Station
SUNSET PUMP STATION
Activity: Altitude Lift Station **Address:** 3515 Park Dr, Rocklin CA

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
677834234	11/20/2007	12/19/2007	30	A10S	\$263.68	1,680
677834234	10/20/2007	10/31/2007	31	A10S	\$303.67	1,800
677834234	9/21/2007	10/19/2007	29	A10S	\$886.36	3,360
677834234	8/22/2007	9/20/2007	30	A10S	\$3,542.99	24,360
677834234	7/25/2007	8/21/2007	28	A10S	\$3,218.42	21,840
677834234	6/22/2007	6/30/2007	33	A10S	\$2,759.20	18,000
677834234	5/23/2007	6/21/2007	30	A10S	\$707.49	1,920
677834234	4/21/2007	5/22/2007	32	A10S	\$344.44	1,800
677834234	3/23/2007	4/20/2007	29	A10S	\$843.25	1,920
677834234	2/22/2007	3/22/2007	29	A10S	\$284.52	1,920
677834234	1/20/2007	2/21/2007	33	A10S	\$300.17	1,920
677834234	12/20/2006	12/31/2006	31	A10S	\$279.78	1,800
677834234	11/21/2006	12/19/2006	29	A10S	\$258.47	1,680
677834234	10/21/2006	10/31/2006	31	A10S	\$298.68	1,800
677834234	9/23/2006	10/20/2006	28	A10S	\$1,613.23	9,240
677834234	8/23/2006	8/31/2006	31	A10S	\$6,607.28	44,760
677834234	7/25/2006	8/22/2006	29	A10S	\$8,294.20	51,240
677834234	6/23/2006	7/24/2006	32	A10S	\$4,916.28	30,840
677834234	5/24/2006	6/22/2006	-	A10S	\$1,427.08	5,160
677834234	4/25/2006	5/23/2006	-	A10S	\$902.33	1,680
677834234	2/23/2006	4/24/2006	-	A10S	\$526.63	3,360
677834234	2/23/2006	3/23/2006	29	A10S	\$1,649.63	7,080
677834234	1/24/2006	2/22/2006	30	A10S	\$281.21	1,800
677834234	12/22/2005	1/23/2006	33	A10S	\$286.30	1,920
				2006	\$27,061.32	160,560
				2007	\$13,733.97	82,320
				Total	\$40,795.29	242,880

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Admin and Control Accts
Activity: Water District Business Office/Solar Metering

Facility Info: Admin Complex
Address: 144 Ferguson Rd, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
7335109005			30	A6	estimated use	24,678	
7335109005			30	A6	estimated use	24,678	
7335109005			30	A6	estimated use	24,678	
7335109005			30	A6	estimated use	24,678	
7335109005			30	A6	estimated use	24,678	
7335109005			30	A6	estimated use	24,678	
7335109005	5/3/2007	5/16/2007	13	A6	\$1,675.33	9,600	
7335109005	4/3/2007	5/3/2007	30	A6	\$45,841.42	26,400	
7335109005	3/6/2007	4/3/2007	28	A6	\$12.70	23,840	
7335109005	2/1/2007	3/6/2007	33	A6	\$14.96	27,680	
7335109005	1/3/2007	2/1/2007	29	A6	\$13.15	24,640	
7335109005	12/4/2006	1/3/2007	30	A6	\$13.60	24,480	
7335109005	11/1/2006	12/4/2006	33	A6	\$14.96	23,680	
7335109005	10/4/2006	11/1/2006	28	A6	\$12.69	20,640	
7335109005	9/1/2006	10/4/2006	33	A6	\$14.96	27,680	
7335109005	8/4/2006	9/1/2006	28	A6	\$12.69	27,360	
7335109005	7/5/2006	8/4/2006	30	A6	\$13.60	33,120	
7335109005	6/5/2006	7/5/2006	30	A6	\$13.60	28,800	
7335109005	5/5/2006	6/5/2006	31	A6	\$14.05	23,040	
7335109005	4/5/2006	5/5/2006	30	A6	\$35,910.92	21,440	
7335109005	3/7/2006	4/5/2006	29	A6	\$13.15	20,480	
7335109005	2/3/2006	3/7/2006	32	A6	\$14.51	22,080	
7335109005	1/5/2006	2/3/2006	29	A6	\$13.15	21,920	
7335109005	12/5/2005	1/5/2006	31	A6	\$13.03	22,240	
					2006	\$36,048.28	270,240
					2007	\$47,571.16	284,706
					Total	\$83,619.44	554,946

Group Name: Water Treatment Plant
Activity: Foothill Treatment Plant and Pump Station

Facility Info: Foothill WTP
Address: 9200 Powerhouse Rd, Newcastle

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
7835682349	11/30/2007	12/31/2007	31	A6	\$4,099.05	36,089	
7835682349	10/31/2007	11/30/2007	30	A6	\$11,514.01	100,368	
7835682349	9/30/2007	10/31/2007	31	A6	\$12,341.93	81,898	
7835682349	8/31/2007	9/30/2007	30	A6	\$6,726.70	46,749	
7835682349	7/31/2007	8/31/2007	31	A6	\$16,194.63	105,679	
7835682349	7/13/2007	7/31/2007	18	A6	\$8.16	139614	
7835682349	6/13/2007	7/13/2007	30	A6	\$13.60	131262	
7835682349	5/14/2007	6/13/2007	30	A6	\$13.60	106522	
7835682349	4/13/2007	5/14/2007	31	A6	\$14.06	69460	
7835682349	3/14/2007	4/13/2007	30	A6	\$6,271.16	53,580	
7835682349	2/12/2007	3/14/2007	30	A6	\$5,612.86	48,260	
7835682349	1/12/2007	2/12/2007	31	A6	\$6,166.69	53,400	
7835682349	12/13/2006	1/12/2007	30	A6	\$4,545.74	39,160	
7835682349	11/10/2006	12/13/2006	33	A6	\$5,518.17	46,920	
7835682349	10/12/2006	11/10/2006	29	A6	\$14,492.92	101,440	
7835682349	9/13/2006	10/12/2006	29	A6	\$13.15	113141	
7835682349	8/15/2006	9/13/2006	29	A6	\$13.15	136903	
7835682349	7/17/2006	8/15/2006	29	A6	\$13.15	138479	
7835682349	6/14/2006	7/17/2006	33	A6	\$14.96	124959	
7835682349	5/15/2006	6/14/2006	30	A6	\$13.60	101133	
7835682349	4/14/2006	5/15/2006	31	A6	\$14.06	37472	
7835682349	3/7/2006	4/14/2006	38	A6	\$17.23	34699	
7835682349	2/12/2006	3/7/2006	23	A6	\$10.43	34163	
7835682349	1/12/2006	2/12/2006	31	A6	\$14.05	35550	
7835682349	12/15/2005	1/12/2006	28	A6	\$12.06	0	
Foothill Electrical Consumption					2006	\$24,680.61	944,019
					2007	\$68,976.45	972,881
					Total	\$93,657.06	1,916,900

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity Warehouse

Facility Info: Warehouse
Address 200 Linden Ave STE 150, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
8028697053	12/27/2007	1/25/2008	29	A1	\$18.51	45
8028697053	11/28/2007	12/27/2007	29	A1	\$17.28	44
8028697053	10/26/2007	11/28/2007	33	A1	\$20.88	56
8028697053	9/27/2007	10/26/2007	29	A1	\$19.86	46
8028697053	8/27/2007	9/27/2007	31	A1	\$19.55	40
8028697053	7/31/2007	8/27/2007	27	A1	\$15.41	26
8028697053	6/28/2007	7/31/2007	33	A1	\$18.50	30
8028697053	5/31/2007	6/28/2007	28	A1	\$17.09	33
8028697053	4/30/2007	5/31/2007	31	A1	\$19.55	40
8028697053	3/30/2007	4/30/2007	31	A1	\$18.89	50
8028697053	2/28/2007	3/30/2007	30	A1	\$18.09	47
8028697053	1/29/2007	2/28/2007	30	A1	\$18.68	51
8028697053	12/28/2006	1/29/2007	32	A1	\$19.86	54
8028697053	11/29/2006	12/28/2006	29	A1	\$17.21	43
8028697053	10/27/2006	11/29/2006	33	A1	\$20.18	51
8028697053	9/28/2006	10/27/2006	29	A1	\$21.70	56
8028697053	8/30/2006	9/28/2006	29	A1	\$18.22	37
8028697053	7/25/2006	8/30/2006	36	A1	\$31.03	94
8028697053	7/24/2006	7/25/2006	1	A1	\$0.57	1
				2006	\$108.91	282
				2007	\$223.64	517
				Total	\$332.55	799

Group Name: Small Accounts
Activity Warehouse

Facility Info: Warehouse
Address 200 Linden Ave. STE 100, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
8028697315	12/27/2007	1/25/2008	29	A1	\$21.77	70
8028697315	11/28/2007	12/27/2007	29	A1	\$20.19	66
8028697315	10/26/2007	11/28/2007	33	A1	\$20.31	52
8028697315	9/27/2007	10/26/2007	29	A1	\$18.40	38
8028697315	8/27/2007	9/27/2007	31	A1	\$13.32	6
8028697315	7/31/2007	8/27/2007	27	A1	\$10.82	1
8028697315	6/28/2007	7/31/2007	33	A1	\$13.20	1
8028697315	5/31/2007	6/28/2007	28	A1	\$11.78	4
8028697315	4/30/2007	5/31/2007	31	A1	\$16.44	23
8028697315	3/30/2007	4/30/2007	31	A1	\$20.21	60
8028697315	2/28/2007	3/30/2007	30	A1	\$21.70	74
8028697315	1/29/2007	2/28/2007	30	A1	\$26.60	110
8028697315	12/28/2006	1/29/2007	32	A1	\$31.01	137
8028697315	11/29/2006	12/28/2006	29	A1	\$25.16	102
8028697315	10/27/2006	11/29/2006	33	A1	\$21.73	62
8028697315	9/28/2006	10/27/2006	29	A1	\$11.98	3
8028697315	8/30/2006	9/28/2006	29	A1	\$12.54	6
8028697315	8/1/2006	8/30/2006	29	A1	\$11.43	0
8028697315	7/24/2006	8/1/2006	8	A1	\$4.58	8
				2006	\$87.42	181
				2007	\$223.98	572
				Total	\$311.40	753

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Small Accounts
Boulder Road Pump Station

Facility Info: Boulder Road Pump Station

Activity: Pump Sta Address: Boulder Rd, Loomis

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
8583841005	12/27/2007	1/25/2008	29	A1	\$29.55	130	
8583841005	11/28/2007	12/27/2007	29	A1	\$28.71	130	
8583841005	10/26/2007	11/28/2007	33	A1	\$32.69	140	
8583841005	9/28/2007	10/26/2007	28	A1	\$33.03	120	
8583841005	8/28/2007	9/28/2007	31	A1	\$36.05	130	
8583841005	7/30/2007	8/28/2007	29	A1	\$33.42	120	
8583841005	6/28/2007	7/30/2007	32	A1	\$36.45	130	
8583841005	5/30/2007	6/28/2007	29	A1	\$35.26	130	
8583841005	5/1/2007	5/30/2007	29	A1	\$31.59	110	
8583841005	3/29/2007	5/1/2007	33	A1	\$33.23	150	
8583841005	2/28/2007	3/29/2007	29	A1	\$27.43	120	
8583841005	1/29/2007	2/28/2007	30	A1	\$29.29	130	
8583841005	12/28/2006	1/29/2007	32	A1	\$34.10	160	
8583841005	11/29/2006	12/28/2006	29	A1	\$27.58	120	
8583841005	10/27/2006	11/29/2006	33	A1	\$34.08	150	
8583841005	9/28/2006	10/27/2006	29	A1	\$33.45	120	
8583841005	8/29/2006	9/28/2006	30	A1	\$33.81	120	
8583841005	7/31/2006	8/29/2006	29	A1	\$31.14	110	
8583841005	6/29/2006	7/31/2006	32	A1	\$35.91	130	
8583841005	5/31/2006	6/29/2006	29	A1	\$32.93	120	
8583841005	5/1/2006	5/31/2006	30	A1	\$35.12	130	
8583841005	3/31/2006	5/1/2006	31	A1	\$29.44	130	
8583841005	3/1/2006	3/31/2006	30	A1	\$28.52	130	
8583841005	1/30/2006	3/1/2006	30	A1	\$29.57	140	
8583841005	12/29/2005	1/30/2006	32	A1	\$30.21	140	
					2006	\$381.76	1,540
					2007	\$391.25	1,570
					Total	\$773.01	3,110

Group Name: Water Treatment Plant

Facility Info: Monte Vista WTP

Activity: PUMP CANAL (MONTE VISTA WTP) Address: Ridge Rd, Canal .1mile East of Montevista Gold Run

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
8682111005	12/7/2007	1/8/2008	32	A1	\$443.61	3,262	
8682111005	11/7/2007	12/7/2007	30	A1	\$342.80	2,491	
8682111005	10/9/2007	11/7/2007	29	A1	\$447.26	2,547	
8682111005	9/11/2007	10/9/2007	28	A1	\$449.81	2,394	
8682111005	8/9/2007	9/11/2007	33	A1	\$644.96	3,448	
8682111005	7/11/2007	8/9/2007	29	A1	\$648.15	3,474	
8682111005	6/12/2007	7/11/2007	29	A1	\$432.42	2,297	
8682111005	5/11/2007	6/12/2007	32	A1	\$565.39	3,016	
8682111005	4/10/2007	5/11/2007	31	A1	\$444.06	2,859	
8682111005	3/12/2007	4/10/2007	29	A1	\$361.10	2,623	
8682111005	2/8/2007	3/12/2007	32	A1	\$593.31	4,336	
8682111005	1/10/2007	2/8/2007	29	A1	\$682.34	4,996	
8682111005	12/11/2006	1/10/2007	30	A1	\$610.76	4,454	
8682111005	11/8/2006	12/11/2006	33	A1	\$474.82	3,432	
8682111005	10/11/2006	11/8/2006	28	A1	\$427.86	2,459	
8682111005	9/12/2006	10/11/2006	29	A1	\$444.10	2,358	
8682111005	8/10/2006	9/12/2006	33	A1	\$539.69	2,914	
8682111005	7/13/2006	8/10/2006	28	A1	\$461.11	2,512	
8682111005	6/13/2006	7/13/2006	30	A1	\$437.54	2,376	
8682111005	5/11/2006	6/13/2006	33	A1	\$509.14	2,769	
8682111005	4/11/2006	5/11/2006	30	A1	\$392.21	2,560	
8682111005	3/13/2006	4/11/2006	29	A1	\$589.87	4,473	
8682111005	2/10/2006	3/13/2006	31	A1	\$525.20	4,026	
8682111005	1/11/2006	2/10/2006	30	A1	\$391.64	2,997	
8682111005	12/12/2005	1/11/2006	30	A1	\$525.06	4,232	
					2006	\$5,193.18	32,876
					2007	\$6,222.36	38,935
					Total	\$11,415.54	71,811

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity Pump

Facility Info: Shady Glen HDR Box Pump
Address Cincinnati & Placer, Roseville

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
8840515005	12/14/2007	1/16/2008	33	A1	\$26.01	93	
8840515005	11/14/2007	12/14/2007	30	A1	\$16.35	34	
8840515005	10/17/2007	11/14/2007	28	A1	\$17.04	38	
8840515005	9/17/2007	10/17/2007	30	A1	\$18.98	39	
8840515005	8/16/2007	9/17/2007	32	A1	\$15.37	15	
8840515005	7/19/2007	8/16/2007	28	A1	\$23.68	69	
8840515005	6/18/2007	7/19/2007	31	A1	\$19.19	38	
8840515005	5/17/2007	6/18/2007	32	A1	\$20.50	43	
8840515005	4/17/2007	5/17/2007	30	A1	\$19.42	47	
8840515005	3/19/2007	4/17/2007	29	A1	\$14.23	21	
8840515005	2/16/2007	3/19/2007	31	A1	\$21.45	69	
8840515005	1/17/2007	2/16/2007	30	A1	\$16.79	37	
8840515005	12/15/2006	1/17/2007	33	A1	\$18.78	43	
8840515005	11/15/2006	12/15/2006	30	A1	\$18.56	50	
8840515005	10/17/2006	11/15/2006	29	A1	\$13.96	16	
8840515005	9/18/2006	10/17/2006	29	A1	\$18.59	39	
8840515005	8/18/2006	9/18/2006	31	A1	\$29.30	94	
8840515005	7/20/2006	8/18/2006	29	A1	\$18.42	39	
8840515005	6/19/2006	7/20/2006	31	A1	\$18.49	35	
8840515005	5/19/2006	6/19/2006	31	A1	\$18.49	35	
8840515005	4/19/2006	5/19/2006	30	A1	\$17.48	35	
8840515005	3/21/2006	4/19/2006	29	A1	\$15.85	34	
8840515005	2/17/2006	3/21/2006	32	A1	\$16.96	34	
8840515005	1/18/2006	2/17/2006	30	A1	\$16.14	34	
8840515005	12/16/2005	1/18/2006	33	A1	\$16.60	34	
					2006	\$202.24	445
					2007	\$221.78	493
					Total	\$424.02	938

Group Name: Small Accounts
Activity SHDY GLN HDR Box pump

Facility Info: Shady Glen HDR Box Pump
Address Rollins Lake Rd, Colfax

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
8890915005	12/10/2007	1/9/2008	30	A1	\$12.27	0	
8890915005	11/8/2007	12/10/2007	32	A1	\$12.62	0	
8890915005	10/10/2007	11/8/2007	29	A1	\$11.43	0	
8890915005	9/11/2007	10/10/2007	29	A1	\$11.43	0	
8890915005	8/10/2007	9/11/2007	32	A1	\$12.62	0	
8890915005	7/13/2007	8/10/2007	28	A1	\$11.04	0	
8890915005	6/13/2007	7/13/2007	30	A1	\$11.83	0	
8890915005	5/11/2007	6/13/2007	33	A1	\$13.02	0	
8890915005	4/12/2007	5/11/2007	29	A1	\$11.44	0	
8890915005	3/13/2007	4/12/2007	30	A1	\$11.83	0	
8890915005	2/10/2007	3/13/2007	31	A1	\$12.23	0	
8890915005	1/10/2007	2/10/2007	31	A1	\$12.22	0	
8890915005	12/12/2006	1/10/2007	29	A1	\$11.43	0	
8890915005	11/10/2006	12/12/2006	32	A1	\$12.62	0	
8890915005	10/12/2006	11/10/2006	29	A1	\$11.43	0	
8890915005	9/13/2006	10/12/2006	29	A1	\$11.43	0	
8890915005	8/12/2006	9/13/2006	32	A1	\$12.62	0	
8890915005	7/14/2006	8/12/2006	29	A1	\$11.43	0	
8890915005	6/13/2006	7/14/2006	31	A1	\$12.22	0	
8890915005	5/12/2006	6/13/2006	32	A1	\$12.80	1	
8890915005	4/12/2006	5/12/2006	30	A1	\$11.83	0	
8890915005	3/15/2006	4/12/2006	28	A1	\$11.04	0	
8890915005	2/11/2006	3/15/2006	32	A1	\$12.61	0	
8890915005	1/11/2006	2/11/2006	31	A1	\$12.22	0	
8890915005	12/13/2005	1/11/2006	29	A1	\$10.73	0	
					2006	\$132.25	1
					2007	\$143.14	0
					Total	\$275.39	1

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Small Accounts

Facility Info: Pipe Alarm System

Activity

Pipe Alarm System

Address

Garret Rd Drump PH & LWR Boardman Gold Run

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
9171484005	12/7/2007	1/8/2008	32	A1	\$29.11	154	
9171484005	11/7/2007	12/7/2007	30	A1	\$34.82	202	
9171484005	10/9/2007	11/7/2007	29	A1	\$37.66	175	
9171484005	9/10/2007	10/9/2007	29	A1	\$36.31	156	
9171484005	8/9/2007	9/10/2007	32	A1	\$31.06	123	
9171484005	7/11/2007	8/9/2007	29	A1	\$28.62	114	
9171484005	6/11/2007	7/11/2007	30	A1	\$31.08	126	
9171484005	5/11/2007	6/11/2007	31	A1	\$35.74	150	
9171484005	4/10/2007	5/11/2007	31	A1	\$37.85	196	
9171484005	3/12/2007	4/10/2007	29	A1	\$30.11	168	
9171484005	2/9/2007	3/12/2007	31	A1	\$39.72	235	
9171484005	1/9/2007	2/9/2007	31	A1	\$41.42	247	
9171484005	12/9/2006	1/9/2007	31	A1	\$41.46	247	
9171484005	11/8/2006	12/9/2006	31	A1	\$38.13	222	
9171484005	10/10/2006	11/8/2006	29	A1	\$36.27	168	
9171484005	9/11/2006	10/10/2006	29	A1	\$33.96	143	
9171484005	8/11/2006	9/11/2006	31	A1	\$30.84	125	
9171484005	7/13/2006	8/11/2006	29	A1	\$27.96	113	
9171484005	6/13/2006	7/13/2006	30	A1	\$29.84	122	
9171484005	5/11/2006	6/13/2006	33	A1	\$35.65	150	
9171484005	4/11/2006	5/11/2006	30	A1	\$19.28	76	
9171484005	3/14/2006	4/11/2006	28	A1	\$18.43	85	
9171484005	2/10/2006	3/14/2006	32	A1	\$15.92	58	
9171484005	1/10/2006	2/10/2006	31	A1	\$13.19	39	
9171484005	12/12/2005	1/10/2006	29	A1	\$9.75	21	
					2006	\$299.47	1,301
					2007	\$425.85	2,139
					Total	\$725.32	3,440

Group Name: Water Treatment Plant

Facility Info: Colfax WTP

Activity: COLFAX TREATMENT PLANT

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
9224666005	12/11/2007	1/10/2008	30	E19SV	\$2,349.14	23,040	
9224666005	11/9/2007	12/11/2007	32	E19SV	\$2,128.32	21,160	
9224666005	10/11/2007	11/9/2007	29	E19SV	\$2,330.43	17,520	
9224666005	9/13/2007	10/11/2007	28	E19SV	\$2,662.76	17,920	
9224666005	8/14/2007	9/13/2007	30	E19SV	\$3,017.11	22,160	
9224666005	7/16/2007	8/14/2007	29	E19SV	\$3,479.49	25,440	
9224666005	6/13/2007	7/16/2007	33	E19SV	\$3,592.85	26,840	
9224666005	5/14/2007	6/13/2007	30	E19SV	\$2,860.95	20,560	
9224666005	4/13/2007	5/14/2007	31	E19SV	\$2,334.93	19,200	
9224666005	3/15/2007	4/13/2007	29	E19SV	\$1,886.20	17,880	
9224666005	2/13/2007	3/15/2007	30	E19SV	\$1,922.23	17,520	
9224666005	1/11/2007	2/13/2007	33	E19SV	\$2,524.04	24,960	
9224666005	12/13/2006	1/11/2007	29	E19SV	\$1,895.34	18,080	
9224666005	11/13/2006	12/13/2006	30	E19SV	\$1,724.68	15,840	
9224666005	10/13/2006	11/13/2006	31	E19SV	\$2,222.33	17,520	
9224666005	9/14/2006	10/13/2006	29	E19SV	\$2,591.05	18,000	
9224666005	8/15/2006	9/14/2006	30	E19SV	\$3,167.50	21,880	
9224666005	7/17/2006	8/15/2006	29	E19SV	\$3,685.62	26,480	
9224666005	6/15/2006	7/17/2006	32	E19SV	\$3,749.25	27,800	
9224666005	5/16/2006	6/15/2006	30	E19SV	\$2,861.13	20,240	
9224666005	4/14/2006	5/16/2006	32	E19SV	\$2,269.64	18,080	
9224666005	3/16/2006	4/14/2006	29	E19SV	\$1,699.40	15,200	
9224666005	2/14/2006	3/16/2006	30	E19SV	\$1,792.61	15,880	
9224666005	1/13/2006	2/14/2006	32	E19SV	\$1,790.29	16,240	
9224666005	12/14/2005	1/13/2006	30	E19SV	\$1,646.29	14,960	
					2006	\$27,553.50	213,160
					2007	\$30,634.65	249,240
					Total	\$58,188.15	462,400

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Small Accounts **Facility Info:** Shop
Activity: Shop **Address:** 449 N Pleasant ST (SHOP), Colfax

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
9266333005	12/11/2007	1/10/2008	30	A1	\$16.98	66
9266333005	11/9/2007	12/11/2007	32	A1	\$20.08	87
9266333005	10/11/2007	11/9/2007	29	A1	\$17.78	60
9266333005	9/13/2007	10/11/2007	28	A1	\$17.16	53
9266333005	8/14/2007	9/13/2007	30	A1	\$17.14	50
9266333005	7/16/2007	8/14/2007	29	A1	\$15.79	44
9266333005	6/13/2007	7/16/2007	33	A1	\$17.40	47
9266333005	5/14/2007	6/13/2007	30	A1	\$16.42	46
9266333005	4/13/2007	5/14/2007	31	A1	\$16.66	54
9266333005	3/15/2007	4/13/2007	29	A1	\$14.91	54
9266333005	2/13/2007	3/15/2007	30	A1	\$16.55	64
9266333005	1/11/2007	2/13/2007	33	A1	\$19.12	77
9266333005	12/13/2006	1/11/2007	29	A1	\$17.27	71
9266333005	11/13/2006	12/13/2006	30	A1	\$17.53	71
9266333005	10/13/2006	11/13/2006	31	A1	\$19.34	68
9266333005	9/14/2006	10/13/2006	29	A1	\$17.99	56
9266333005	8/15/2006	9/14/2006	30	A1	\$24.30	90
9266333005	7/17/2006	8/15/2006	29	A1	\$16.14	47
9266333005	6/14/2006	7/17/2006	33	A1	\$17.38	48
9266333005	5/16/2006	6/14/2006	29	A1	\$15.60	44
9266333005	4/14/2006	5/16/2006	32	A1	\$16.89	54
9266333005	3/16/2006	4/14/2006	29	A1	\$15.09	57
9266333005	2/13/2006	3/16/2006	31	A1	\$16.68	66
9266333005	1/13/2006	2/13/2006	31	A1	\$17.38	72
9266333005	12/14/2005	1/13/2006	30	A1	\$16.69	75
				2006	\$194.32	673
				2007	\$206.28	707
				Total	\$400.60	1,380

Group Name: Small Accounts **Facility Info:** Colfax WTP Outdoor Lights
Activity: Colfax Treatment Plant -Street Lights **Address:** 449 N Pleasant ST (Street light), Colfax

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage
5472240005	12/20/2007	1/19/2008	30	OL1	\$10.37	29
5472240005	11/20/2007	12/20/2007	30	OL1	\$11.24	29
5472240005	10/22/2007	11/20/2007	29	OL1	\$11.24	28
5472240005	9/21/2007	10/22/2007	31	OL1	\$11.24	30
5472240005	8/22/2007	9/21/2007	30	OL1	\$11.24	29
5472240005	7/24/2007	8/22/2007	29	OL1	\$11.24	28
5472240005	6/22/2007	7/24/2007	32	OL1	\$11.24	31
5472240005	5/23/2007	6/22/2007	30	OL1	\$11.24	29
5472240005	4/23/2007	5/23/2007	30	OL1	\$11.24	29
5472240005	3/23/2007	4/23/2007	31	OL1	\$11.24	30
5472240005	2/22/2007	3/23/2007	29	OL1	\$11.25	28
5472240005	1/23/2007	2/22/2007	30	OL1	\$11.32	29
5472240005	12/21/2006	1/23/2007	33	OL1	\$11.29	32
5472240005	11/21/2006	12/21/2006	30	OL1	\$11.21	29
5472240005	10/23/2006	11/21/2006	29	OL1	\$11.21	28
5472240005	9/22/2006	10/23/2006	31	OL1	\$11.21	30
5472240005	8/23/2006	9/22/2006	30	OL1	\$11.17	29
5472240005	7/25/2006	8/23/2006	29	OL1	\$11.06	28
5472240005	6/23/2006	7/25/2006	32	OL1	\$11.06	31
5472240005	5/24/2006	6/23/2006	30	OL1	\$11.06	29
5472240005	4/25/2006	5/24/2006	29	OL1	\$11.06	28
5472240005	3/15/2006	4/25/2006	41	OL1	\$15.03	40
5472240005	2/13/2006	3/15/2006	30	OL1	\$10.89	29
5472240005	1/12/2006	2/13/2006	32	OL1	\$10.86	31
5472240005	12/14/2005	1/12/2006	29	OL1	\$9.55	28
				2006	\$125.82	332
				2007	\$135.02	352
				Total	\$260.84	684

Appendix A

Pacific Gas and Electric Detailed Electricity Use Calculations

Group Name: Small Accounts
Activity: Pressure Reducing STA

Facility Info: Pressure Reducing Station
Address: Taylor/Brace, Loomis

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
9572662005	12/26/2007	1/24/2008	29	A1	\$13.50	39	
9572662005	11/27/2007	12/26/2007	29	A1	\$13.17	41	
9572662005	10/25/2007	11/27/2007	33	A1	\$15.47	47	
9572662005	9/26/2007	10/25/2007	29	A1	\$15.24	41	
9572662005	8/27/2007	9/26/2007	30	A1	\$16.23	45	
9572662005	7/27/2007	8/27/2007	31	A1	\$16.68	46	
9572662005	6/27/2007	7/27/2007	30	A1	\$16.05	44	
9572662005	5/29/2007	6/27/2007	29	A1	\$15.24	41	
9572662005	4/27/2007	5/29/2007	32	A1	\$16.74	46	
9572662005	3/28/2007	4/27/2007	30	A1	\$13.71	43	
9572662005	2/27/2007	3/28/2007	29	A1	\$13.19	41	
9572662005	1/25/2007	2/27/2007	33	A1	\$15.09	47	
9572662005	12/27/2006	1/25/2007	29	A1	\$13.35	42	
9572662005	11/28/2006	12/27/2006	29	A1	\$13.24	41	
9572662005	10/26/2006	11/28/2006	33	A1	\$15.60	48	
9572662005	9/27/2006	10/26/2006	29	A1	\$15.25	41	
9572662005	8/28/2006	9/27/2006	30	A1	\$15.86	43	
9572662005	7/28/2006	8/28/2006	31	A1	\$16.31	45	
9572662005	6/28/2006	7/28/2006	30	A1	\$15.86	44	
9572662005	5/30/2006	6/28/2006	29	A1	\$15.07	41	
9572662005	4/28/2006	5/30/2006	32	A1	\$15.73	41	
9572662005	3/30/2006	4/28/2006	29	A1	\$11.39	28	
9572662005	2/28/2006	3/30/2006	30	A1	\$11.58	28	
9572662005	1/27/2006	2/28/2006	32	A1	\$12.32	30	
9572662005	12/28/2005	1/27/2006	30	A1	\$12.82	39	
					2006	\$171.03	469
					2007	\$180.16	524
					Total	\$351.19	993

Group Name: Pump Station
Activity: WWD - TURBINE PUMPS

Facility Info: Auburn Tunnel Pump Station
Address: 10715 Ophir Rd, Auburn

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
9588588496	11/30/2007	12/31/2007	31	A6	\$209.75	1,698	
9588588496	10/31/2007	11/30/2007	30	A6	\$67,347.89	599,416	
9588588496	9/30/2007	10/31/2007	31	A6	\$65,748.98	436,679	
9588588496	8/31/2007	9/30/2007	30	A6	\$17.86	0	
9588588496	7/30/2007	8/31/2007	32	A6	\$19.04	0	
9588588496	6/28/2007	7/31/2007	33	A6	\$19.64	0	
9588588496	5/30/2007	6/28/2007	29	A6	\$17.26	0	
9588588496	4/27/2007	5/30/2007	33	A6	\$19.64	0	
9588588496	3/28/2007	4/27/2007	30	A6	\$17.86	0	
9588588496	2/27/2007	3/28/2007	29	A6	\$17.26	0	
9588588496	1/26/2007	2/27/2007	32	A6	\$19.05	0	
9588588496	12/27/2006	1/26/2007	30	A6	\$17.86	0	
9588588496	11/28/2006	12/27/2006	29	A6	\$17.26	0	
9588588496	10/31/2006	11/28/2006	28	A6	\$68,745.95	585,100	
9588588496	9/30/2006	10/31/2006	31	A6	\$18.45	0	
9588588496	8/31/2006	9/30/2006	30	A6	\$17.86	0	
9588588496	7/31/2006	8/31/2006	31	A6	\$18.45	0	
9588588496	6/22/2006	7/31/2006	39	A6	\$23.22	0	
9588588496	5/31/2006	6/22/2006	22	A6	\$13.09	0	
9588588496	5/1/2006	5/31/2006	30	A6	\$17.86	0	
9588588496	3/30/2006	5/1/2006	32	A6	\$19.04	0	
9588588496	2/27/2006	3/30/2006	31	A6	\$18.45	0	
9588588496	1/30/2006	2/27/2006	28	E20S	\$551.95	0	
9588588496	12/29/2005	1/30/2006	32	E20S	\$616.68	0	
					2006	\$70,078.26	585,100
					2007	\$133,472.09	1,037,793
					Total	\$203,550.35	1,622,893

Appendix A
Pacific Gas and Electric
Detailed Electricity Use Calculations

Group Name: Small Accounts

Facility Info: Pump Controller

Activity Pump Controller

Address 9883 Glenview Rd, Newcastle

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
9682560005	12/10/2007	1/9/2008	30	A1	\$9.57	10	
9682560005	11/8/2007	12/10/2007	32	A1	\$12.11	27	
9682560005	10/10/2007	11/8/2007	29	A1	\$15.35	45	
9682560005	9/11/2007	10/10/2007	29	A1	\$15.05	40	
9682560005	8/10/2007	9/11/2007	32	A1	\$16.77	45	
9682560005	7/12/2007	8/10/2007	29	A1	\$15.24	41	
9682560005	6/12/2007	7/12/2007	30	A1	\$16.04	44	
9682560005	5/11/2007	6/12/2007	32	A1	\$16.76	45	
9682560005	4/11/2007	5/11/2007	30	A1	\$13.00	33	
9682560005	3/13/2007	4/11/2007	29	A1	\$12.52	36	
9682560005	2/9/2007	3/13/2007	32	A1	\$11.59	23	
9682560005	1/10/2007	2/9/2007	30	A1	\$9.86	14	
9682560005	12/11/2006	1/10/2007	30	A1	\$9.73	13	
9682560005	11/9/2006	12/11/2006	32	A1	\$11.35	21	
9682560005	10/11/2006	11/9/2006	29	A1	\$14.29	39	
9682560005	9/12/2006	10/11/2006	29	A1	\$15.25	41	
9682560005	8/11/2006	9/12/2006	32	A1	\$16.83	46	
9682560005	7/14/2006	8/11/2006	28	A1	\$14.26	38	
9682560005	6/14/2006	7/14/2006	30	A1	\$15.68	43	
9682560005	5/12/2006	6/14/2006	33	A1	\$17.56	49	
9682560005	4/13/2006	5/12/2006	29	A1	\$13.29	37	
9682560005	3/15/2006	4/13/2006	29	A1	\$9.67	15	
9682560005	2/10/2006	3/15/2006	33	A1	\$11.71	23	
9682560005	1/12/2006	2/10/2006	29	A1	\$9.62	15	
9682560005	12/13/2005	1/12/2006	30	A1	\$9.82	19	
					2006	\$149.51	367
					2007	\$164.02	406
					Total	\$313.53	773

Group Name: Small Accounts

Facility Info: Telemetry controls

Activity Telemetry Controls

Address WhitneyBlvd & Crest dr Rocklin

Service ID	From	To	Days	Rate Schedule	Electric Charges	Electric Usage	
9779141005	11/19/2007	12/19/2007	30	A1	\$11.70	28	
9779141005	10/22/2007	11/19/2007	28	A1	\$11.20	25	
9779141005	9/20/2007	10/22/2007	32	A1	\$16.22	42	
9779141005	8/21/2007	9/20/2007	30	A1	\$12.75	26	
9779141005	7/24/2007	8/21/2007	28	A1	\$12.04	25	
9779141005	6/22/2007	7/24/2007	32	A1	\$13.84	29	
9779141005	5/22/2007	6/22/2007	31	A1	\$13.02	26	
9779141005	4/23/2007	5/22/2007	29	A1	\$16.28	50	
9779141005	3/22/2007	4/23/2007	32	A1	\$13.32	36	
9779141005	2/21/2007	3/22/2007	29	A1	\$11.05	25	
9779141005	1/22/2007	2/21/2007	30	A1	\$11.61	27	
9779141005	12/21/2006	1/22/2007	32	A1	\$12.28	28	
9779141005	11/20/2006	12/21/2006	31	A1	\$12.02	28	
9779141005	10/20/2006	11/20/2006	31	A1	\$13.11	32	
9779141005	9/22/2006	10/20/2006	28	A1	\$13.32	32	
9779141005	8/22/2006	9/22/2006	31	A1	\$14.81	36	
9779141005	7/25/2006	8/22/2006	28	A1	\$13.01	31	
9779141005	6/22/2006	7/25/2006	33	A1	\$15.59	38	
9779141005	5/23/2006	6/22/2006	30	A1	\$19.63	65	
9779141005	4/24/2006	5/23/2006	29	A1	\$23.62	94	
9779141005	3/24/2006	4/24/2006	31	A1	\$23.62	118	
9779141005	2/22/2006	3/24/2006	30	A1	\$22.84	116	
9779141005	1/23/2006	2/22/2006	30	A1	\$22.55	115	
9779141005	12/21/2005	1/23/2006	33	A1	\$24.55	129	
					2006	\$218.67	834
					2007	\$155.31	367
					Total	\$373.98	1,201

APPENDIX B: COMPARISON OF DETAILED ELECTRICITY BILLS AND PG&E SUMMARY BILL

Appendix B Electricity Use and Cost by Facility

Category	Facility	2006 Electricity Use (kWh)	2006 Cost	2006 Average Cost per kWh	2007 Electricity Use (kWh)	2007 Cost	2007 Average Cost per kWh
Maintenance, Administrative and Control Accounts	Sierra Pacific Accounts	442,477	\$59,901	\$0.14	264,420	\$51,756	\$0.20
	13448 Lincoln Way, Auburn	16,233	\$2,766	\$0.17	13,588	\$2,373	\$0.17
	Control Building PRV Controls	24,342	\$3,369	\$0.14	41,689	\$5,917	\$0.14
	Maidu Maintenance Complex	186,960	\$29,038	\$0.16	203,160	\$34,661	\$0.17
	Microwave Station	26,776	\$4,395	\$0.16	24,812	\$4,021	\$0.16
	PCWA Admin Complex ^c	270,240	\$36,048	-	284,706	\$47,571	-
	Lincoln Metering Station	9,624	\$1,511	\$0.16	16,606	\$2,459	\$0.15
	SCADA Comm Tower	11,657	\$1,942	\$0.17	12,328	\$2,054	\$0.17
Power Division	French Meadows Power House	104,642	\$14,872	\$0.14	118,792	\$17,902	\$0.15
	Oxbow Power House	14,620	\$3,283	\$0.22	29,610	\$5,448	\$0.18
	Ralston Power House	16,810	\$4,815	\$0.29	95,050	\$16,376	\$0.17
	Middle Fork Power House	50,760	\$9,169	\$0.18	160,820	\$28,815	\$0.18
	Hell Hole Power House	18,878	\$3,087	\$0.16	18,749	\$3,166	\$0.17
	Power Systems HQ	52,760	\$8,083	\$0.15	48,680	\$7,650	\$0.16
	French Meadows Power House Meter	2,760	\$2,142	\$0.78	7,869	\$1,511	\$0.19
Pump Stations	Auburn Tunnel Pump Station	585,100	\$70,078	\$0.12	1,037,793	\$133,472	\$0.13
	Rock Creek Pump Station	64,200	\$11,430	\$0.18	95,320	\$16,900	\$0.18
	Laird Pump Station	83,454	\$13,102	\$0.16	81,783	\$13,804	\$0.17
	American River PS	966,620	\$137,807	\$0.14	2,911,394	\$392,972	\$0.13
	Skyridge Pump Station	84,174	\$11,087	\$0.13	90,613	\$11,971	\$0.13
	Stoneridge Pump Station ^b	177,320	\$35,336	-	179,200	\$40,298	-
	Sunset Pumps	160,560	\$27,061	\$0.17	82,320	\$13,734	\$0.17
	Tinker Road Pump Station	166,240	\$22,464	\$0.14	510,080	\$63,337	\$0.12
	Turner Pump Station	106,962	\$10,845	\$0.10	105,954	\$11,237	\$0.11
	North Auburn pump Station	26,608	\$4,079	\$0.15	0	\$92	-
	North Star Pump Station	8,520	\$1,589	\$0.19	8,480	\$1,589	\$0.19
Water Treatment Plants	ALTA WTP	62,041	\$8,399	\$0.14	56,767	\$7,696	\$0.14
	Applegate WTP	56,673	\$9,061	\$0.16	66,995	\$9,359	\$0.14
	Auburn WTP ^d	86,997	\$13,634	\$0.16	574,294	\$105,151	\$0.18
	Bowman WTP	298,400	\$40,330	\$0.14	314,200	\$41,607	\$0.13
	Colfax WTP	213,160	\$27,554	\$0.13	249,240	\$30,635	\$0.12
	Foothill WTP ^a	944,019	\$24,681	-	972,881	\$68,976	-
	Monte Vista WTP	32,876	\$5,193	\$0.16	38,935	\$6,222	\$0.16
	Sunset WTP	96,084	\$16,105	\$0.17	74,962	\$12,601	\$0.17
Small Accounts		40,438	\$10,641	\$0.26	36,344	\$10,412	\$0.29
Total Use, Cost and Average Cost per kWh		5,509,985	\$684,897	\$0.12	8,828,434	\$1,223,745	\$0.14

^a Foothill WTP was under billed by PG&E. Electrical use estimated.

^b Stoneridge Pump Station electricity records partially unavailable. Electrical use estimated.

^c Admin Complex electricity use estimated for August-December 2007.

^d Auburn WTP 2007 electrical cost and electrical use was metered through three PG&E meters (84P365, 84P362 and 1P9886) which combines electrical use from the Sierra Center, Communication Tower, parking lights, gate access control, PCWA Business Complex, North Auburn Pump Station and Auburn WTP.

APPENDIX C: ELECTRICITY USE AND COST BY MONTH

Appendix C

Monthly Electricity Use and Cost Charts

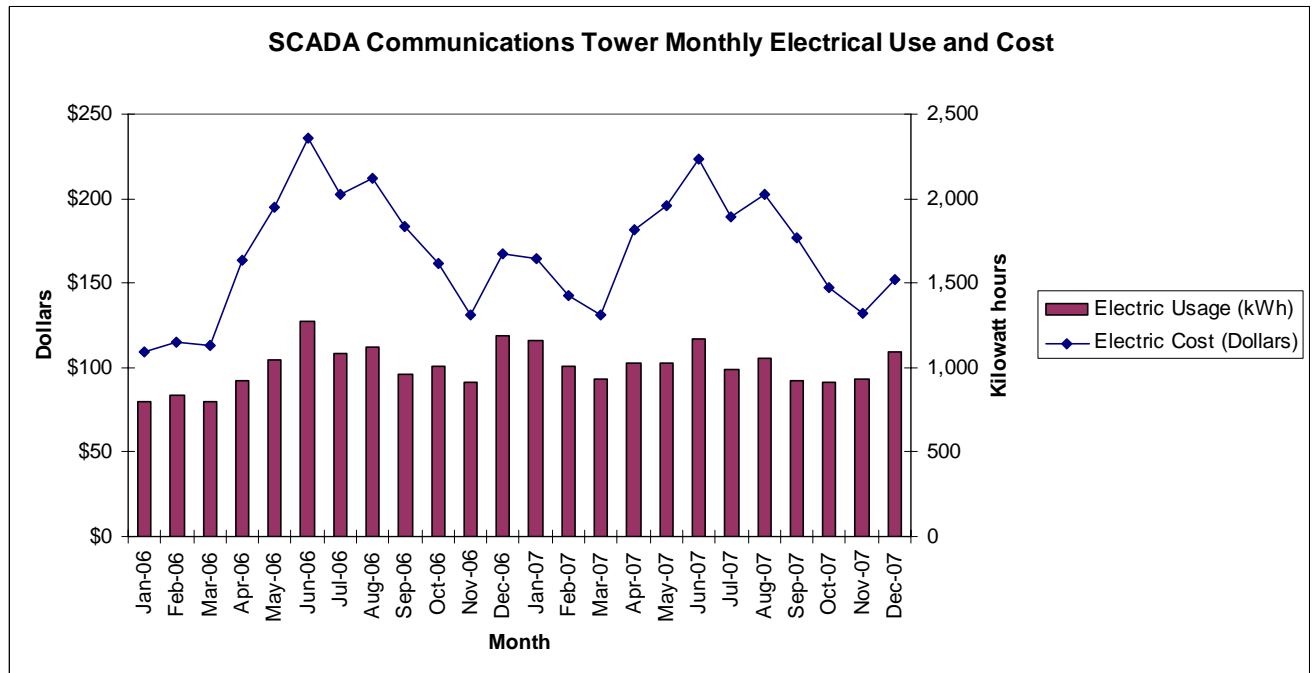
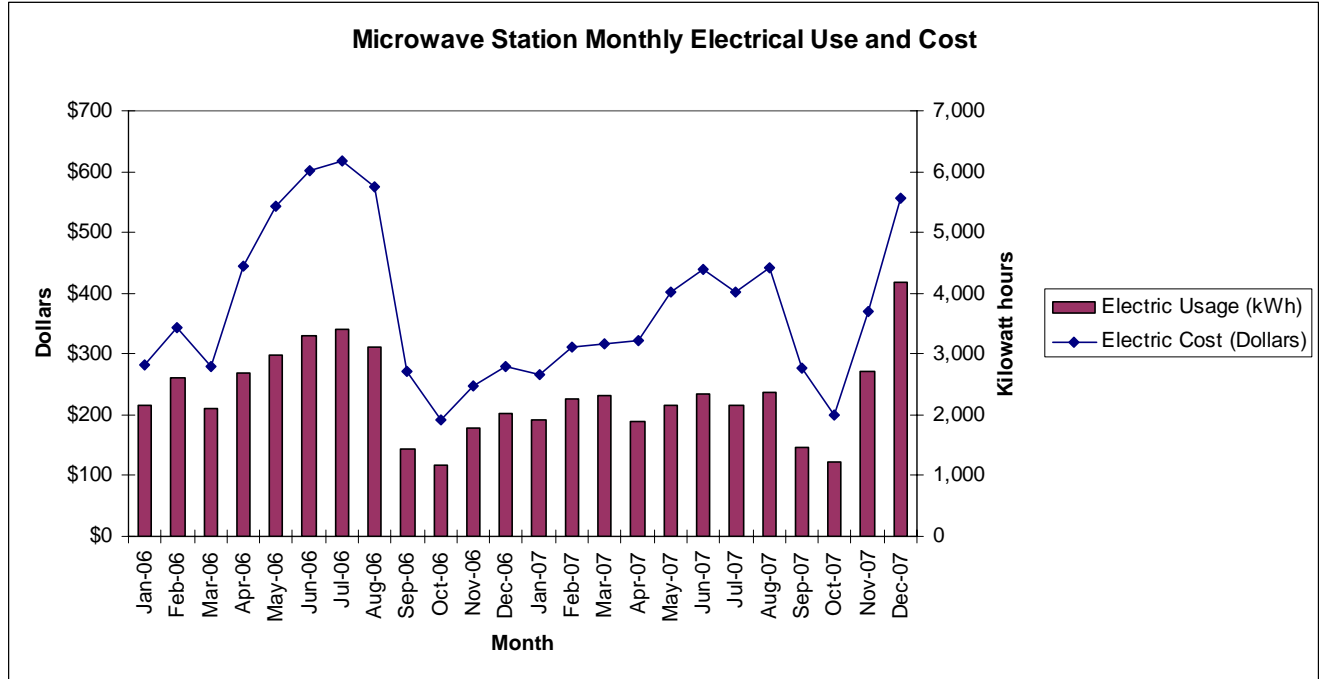
Appendix C contains bar and line charts associated with PCWA facilities. The electric records for some facilities were incomplete, interrupted, or otherwise inappropriate for graphing and are not included in this appendix.

There are two types of graphs in this Appendix, a line-bar graph and a bar-bar graph.

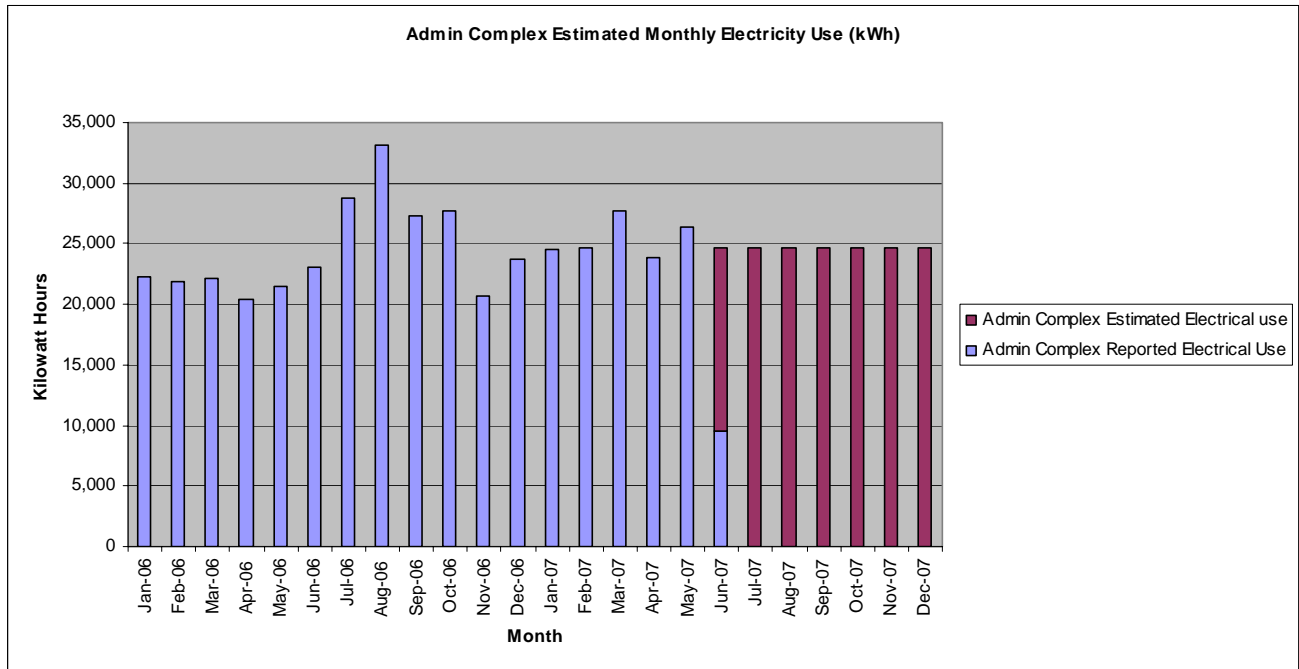
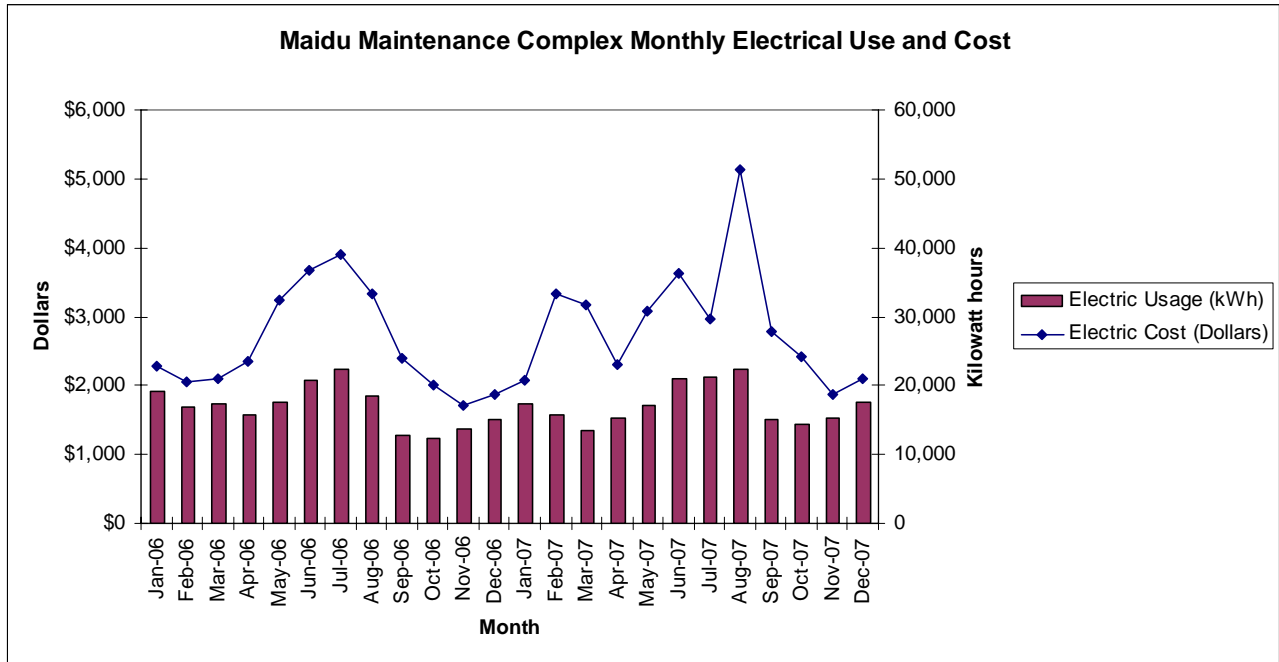
Line-bar graphs are used to show electric cost and usage together for a single bill. Cost is indicated on the left axis and is correlated with the blue line on the graph. Electric usage is indicated on the right axis in kilowatt hours, and correlates with the maroon bars on the graph. When electric cost is high, there is a larger gap between the bars and the line. When the monthly cost for electricity is lower than \$0.10 per kWh, the line is below the top of the bars.

Bar-bar graphs are used to show monthly usage at a facility where the billing was estimated for some months, or at facilities where billing was changed during 2006 or 2007, and is reported in two bills. Monthly electrical usage is indicated on the left axis and correlates to both colors of bars. Each bar color correlates to an electric bill or estimate. Cost is not plotted on bar-bar graphs.

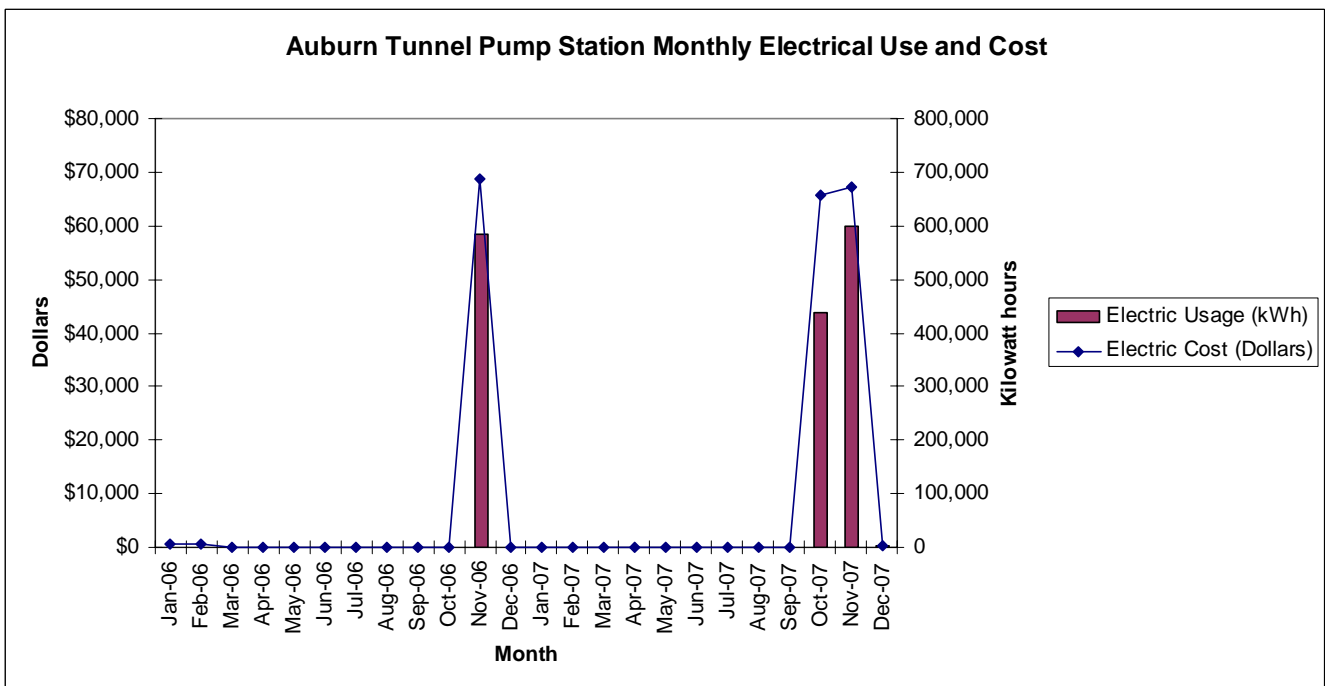
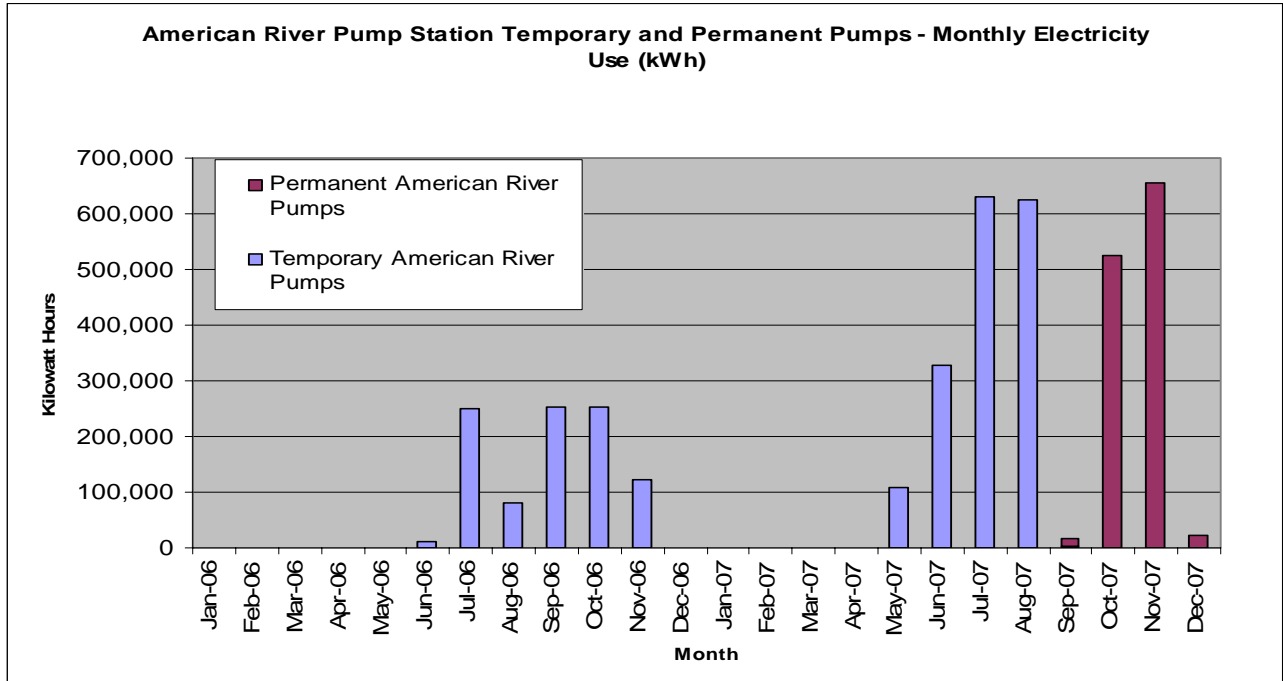
Selected Facilities from the Maintenance, Administrative, and Control Category



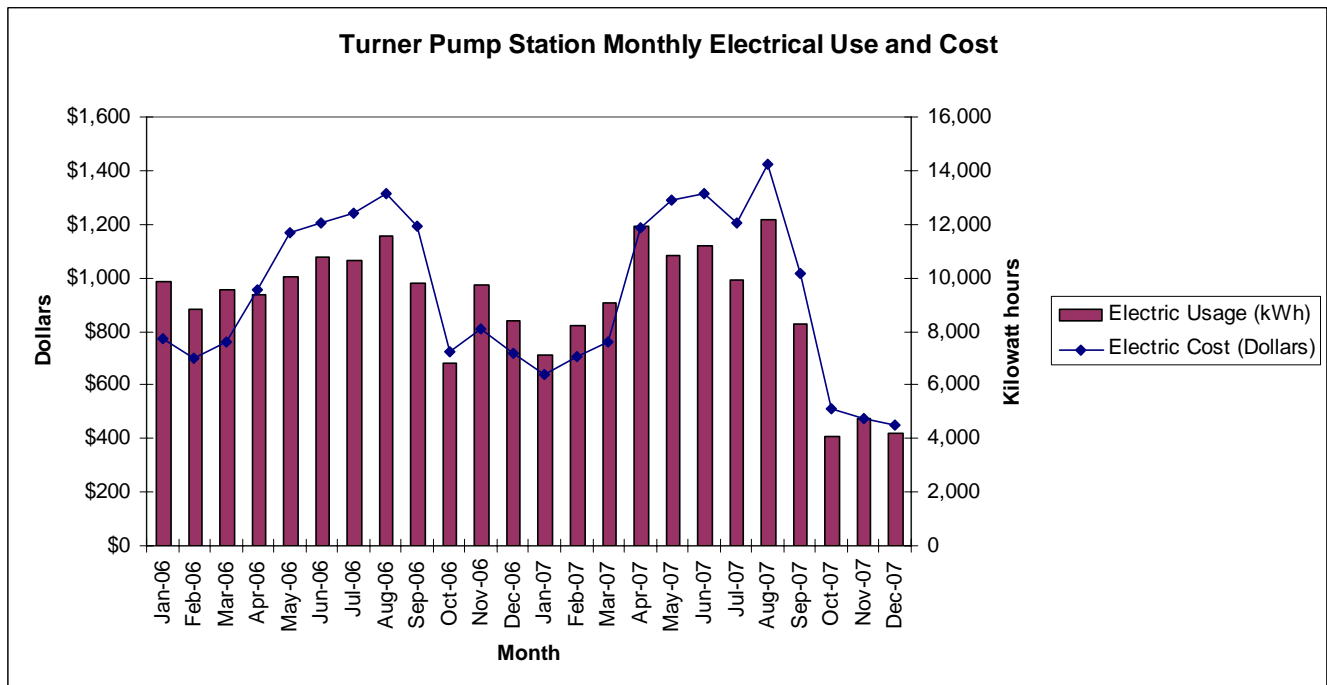
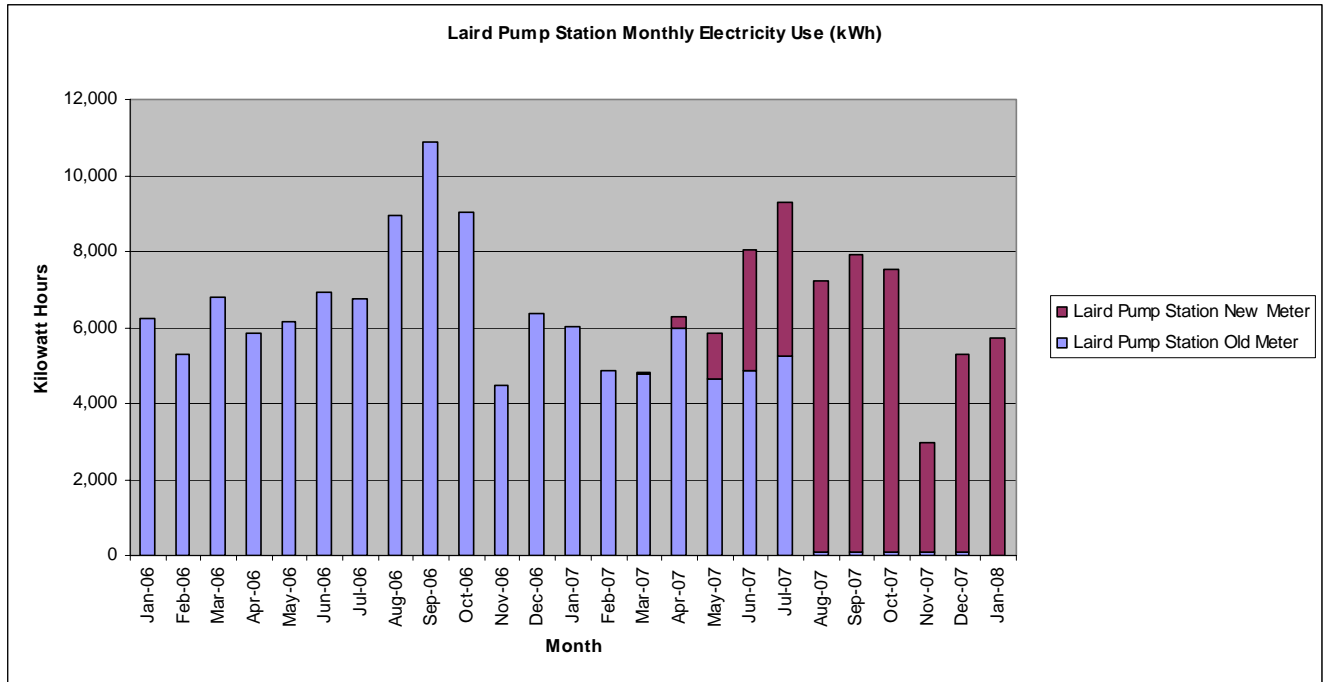
Appendix C: Electricity Use and Cost by Month



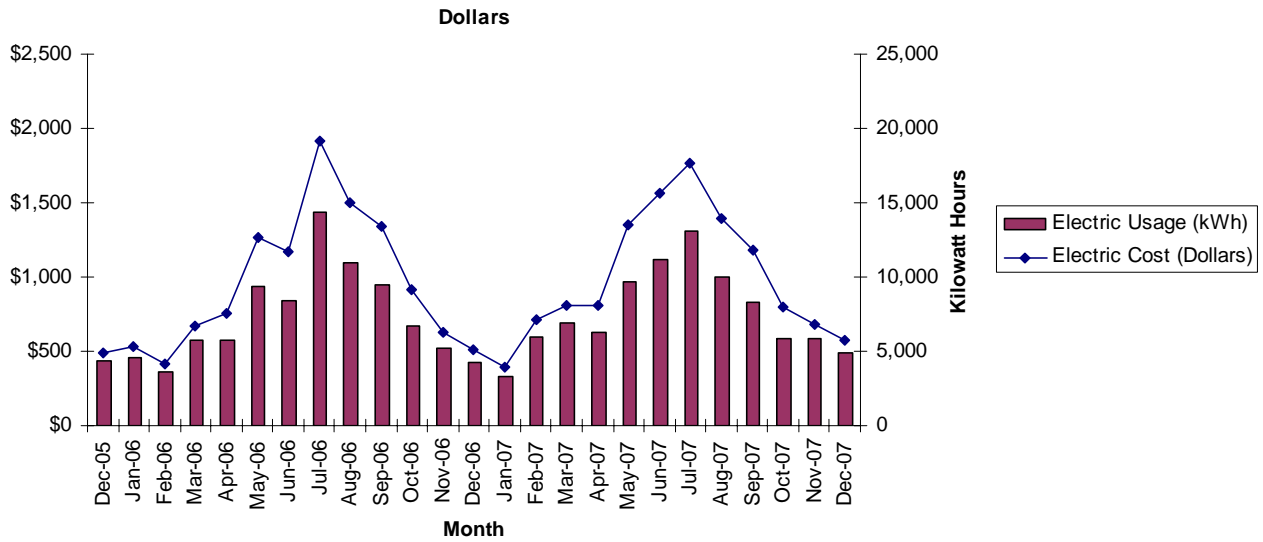
Selected Facilities from the Pump Station Category



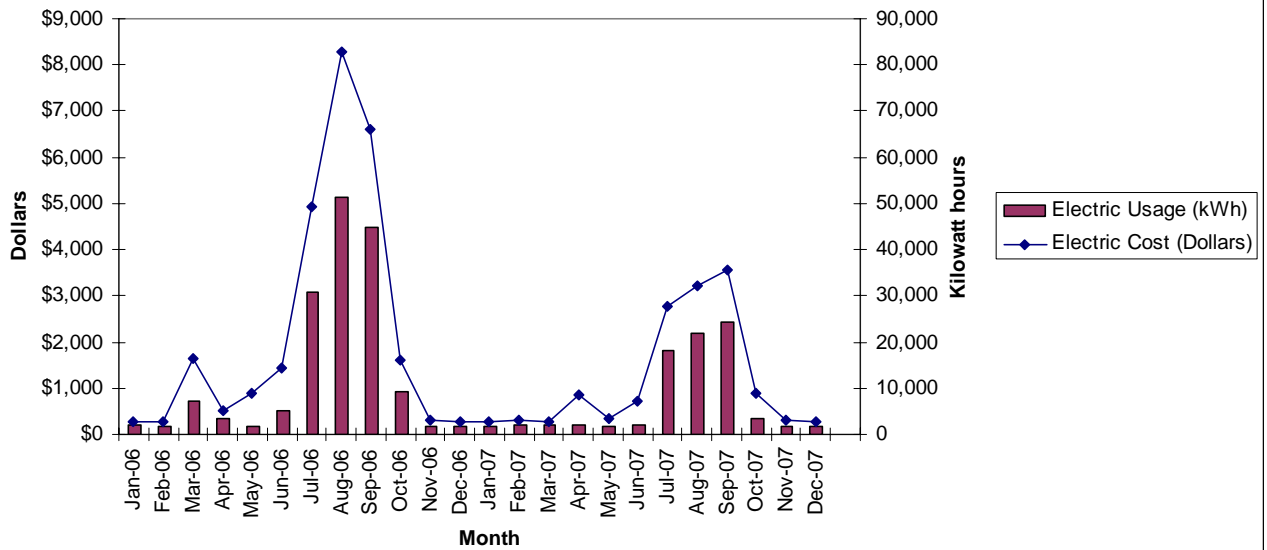
Appendix C: Electricity Use and Cost by Month



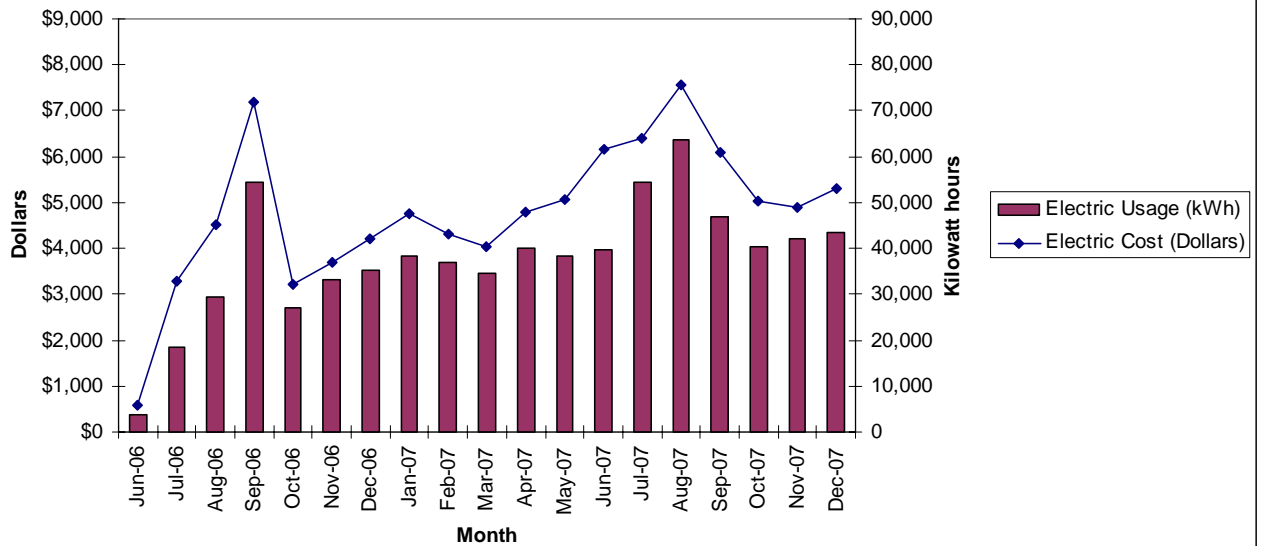
Skyridge Pump Station Monthly Electrical Use and Cost



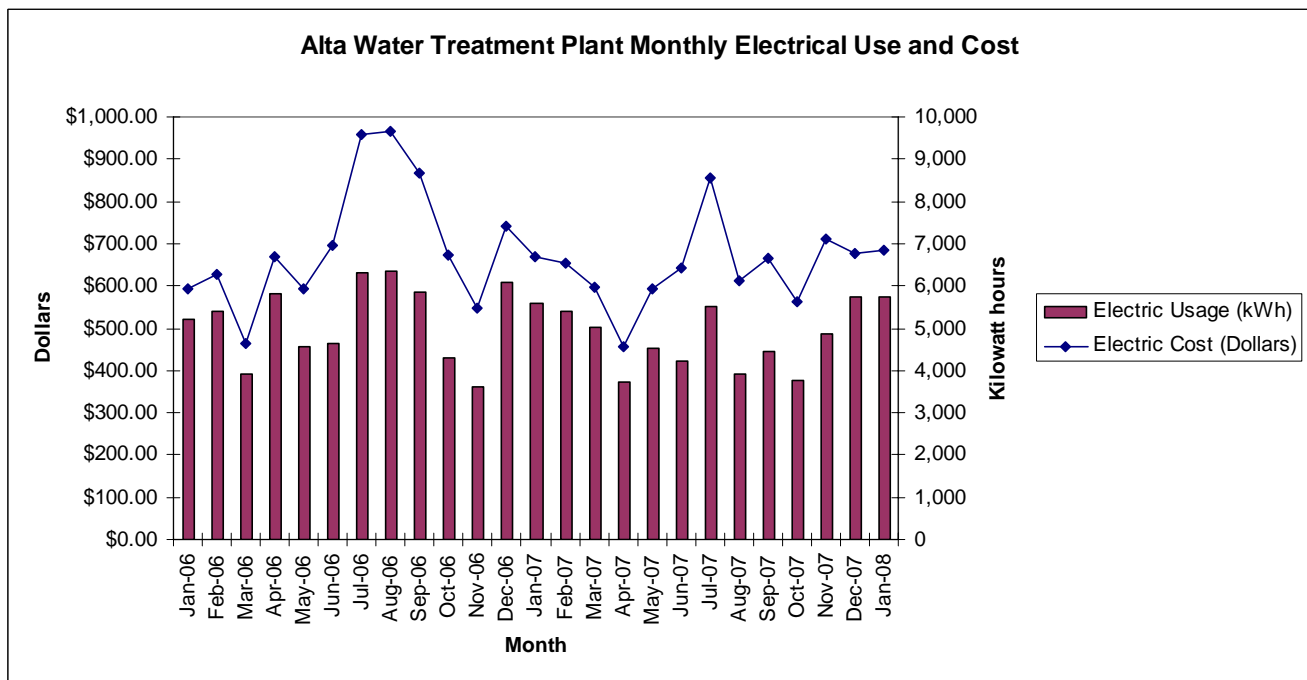
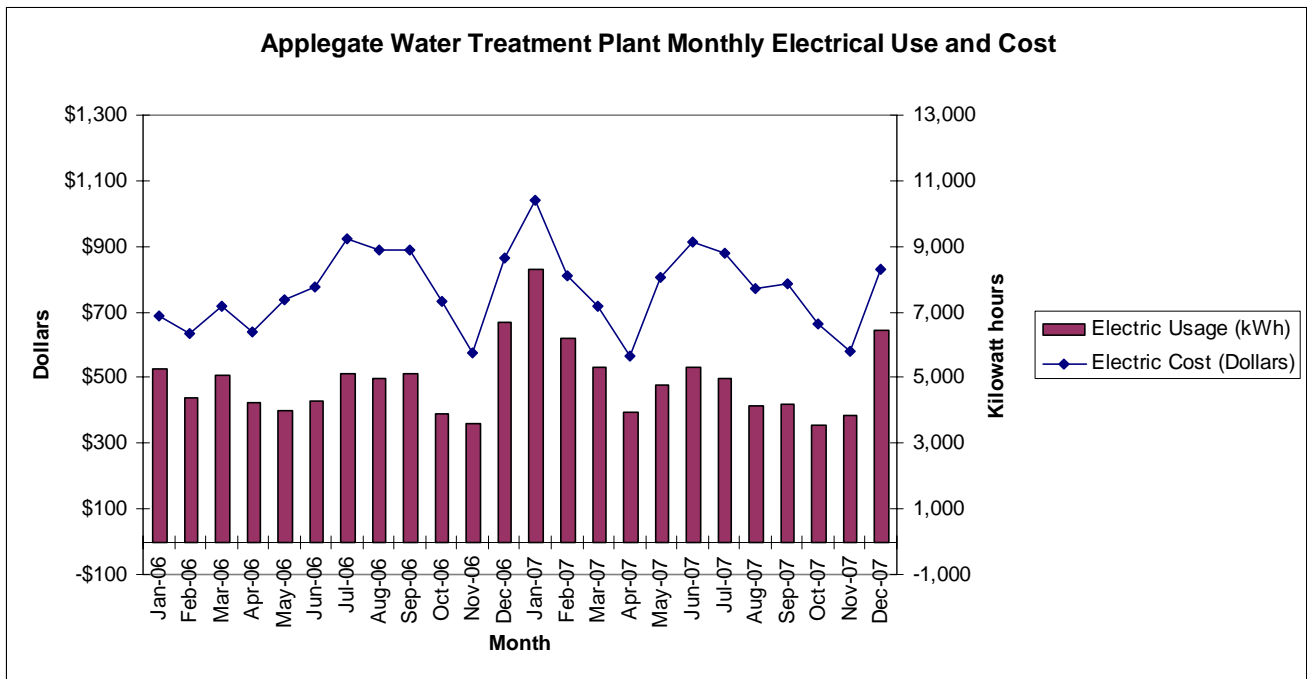
Sunset Pump Station Monthly Electrical Use and Cost



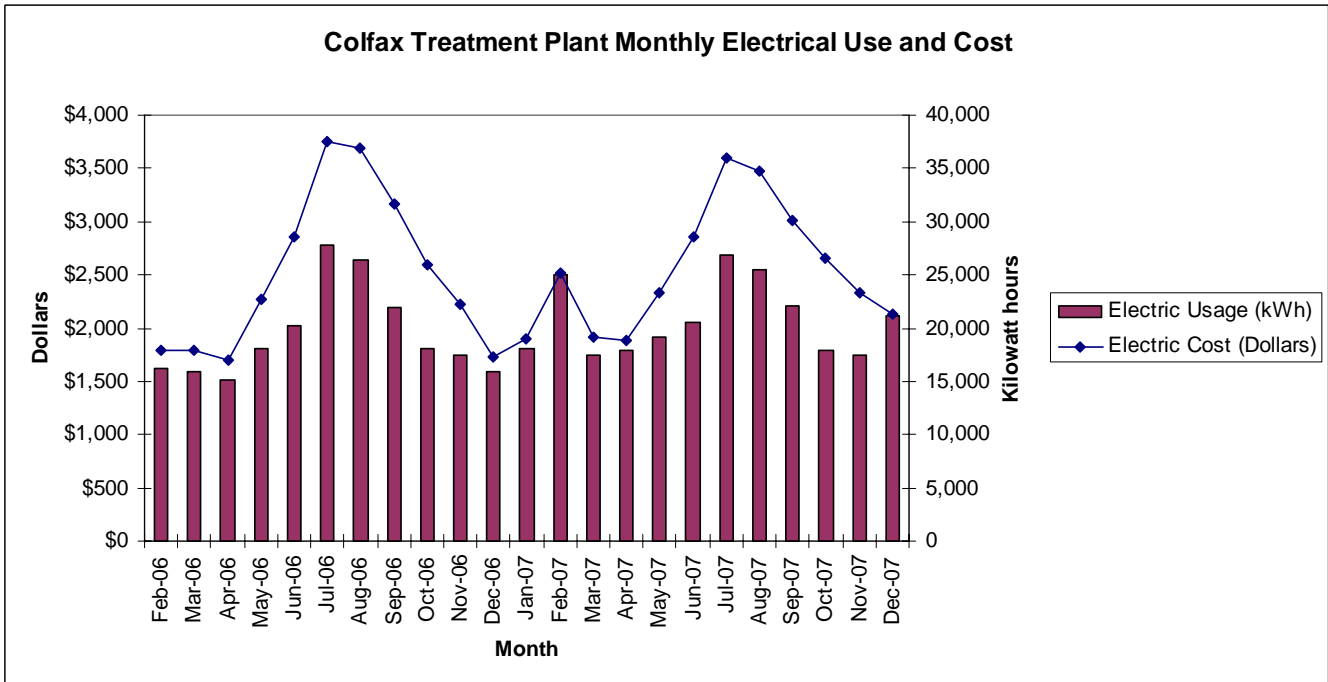
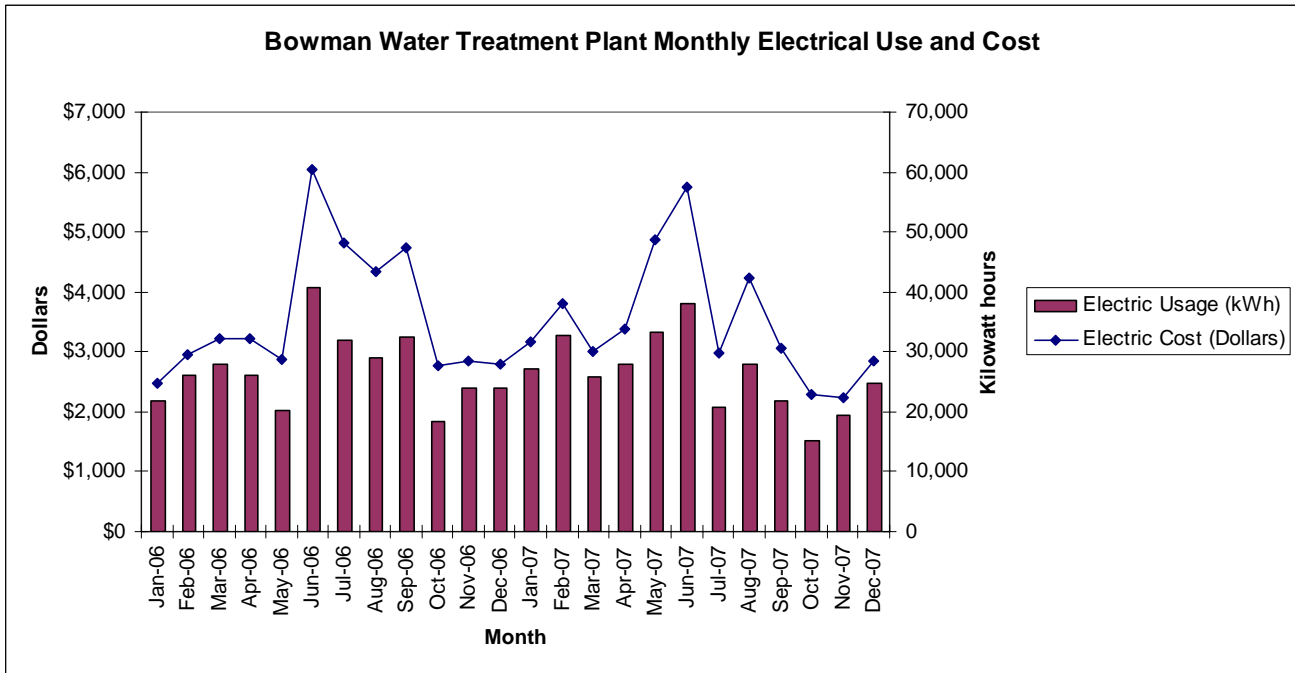
Tinker Road Pumping Plant Monthly Electrical Use and Cost



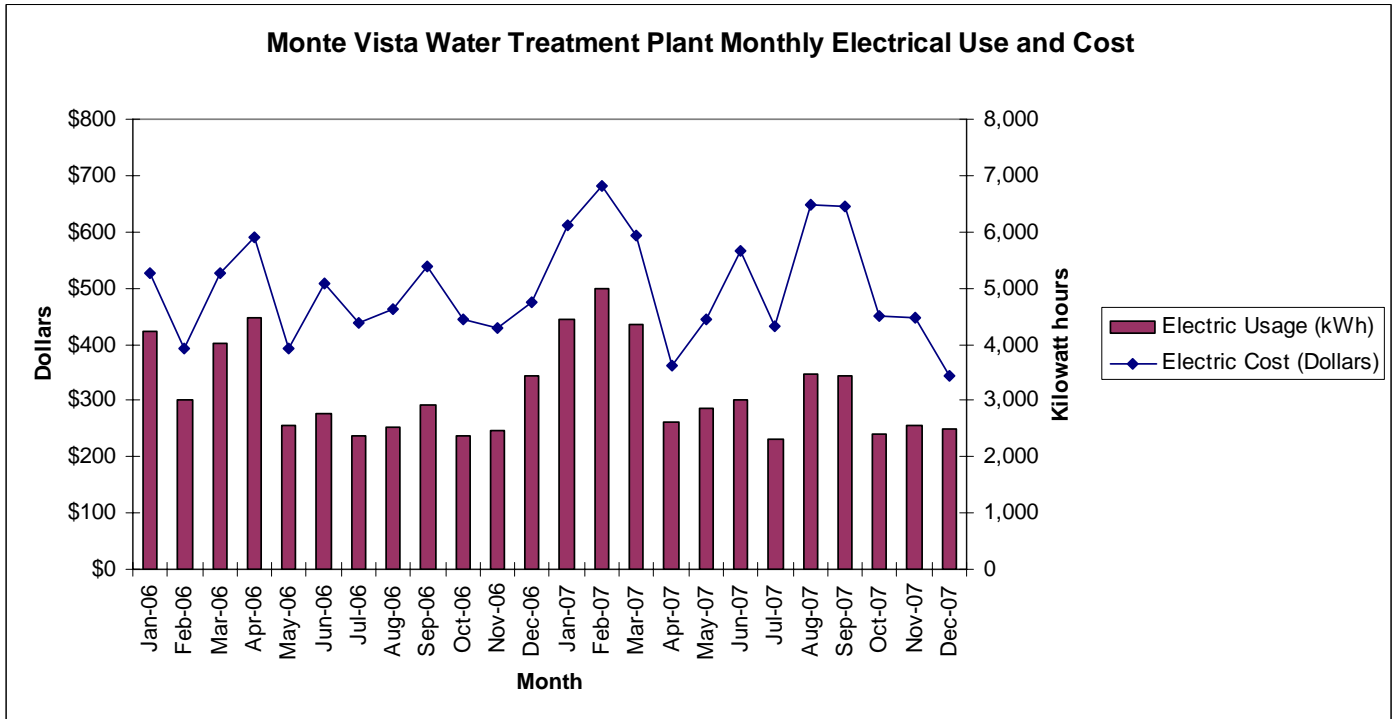
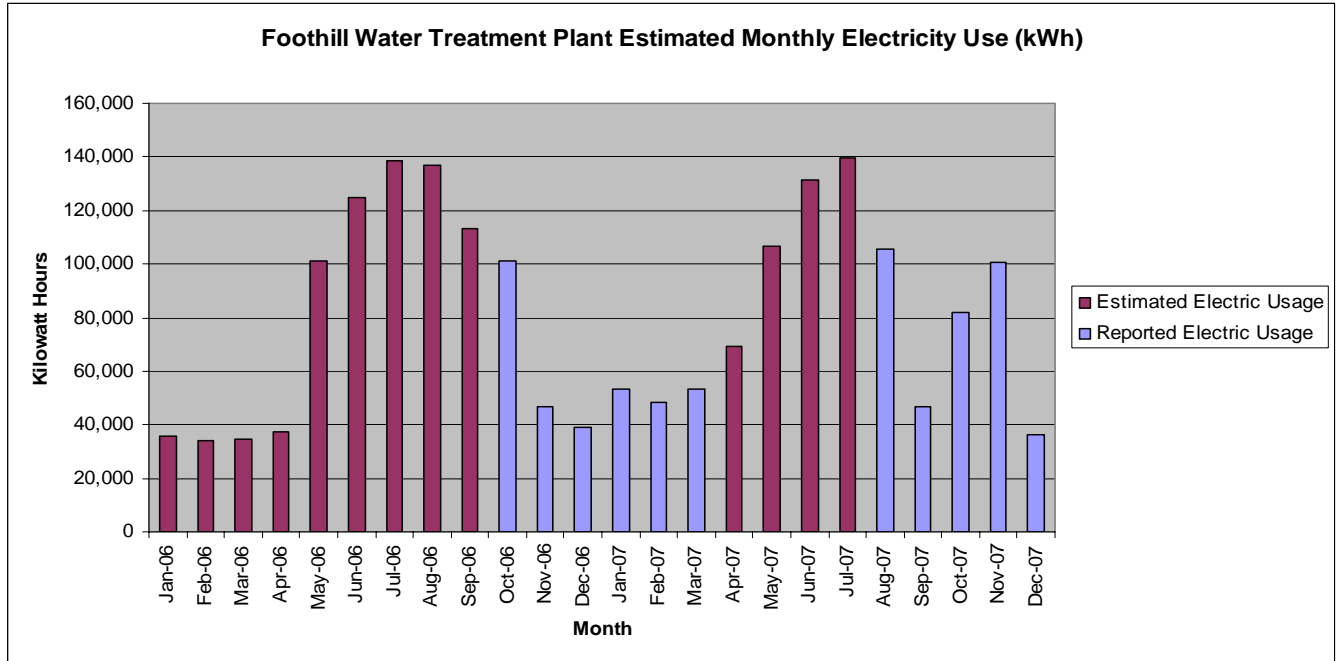
Selected Facilities from the Water Treatment Plants Category



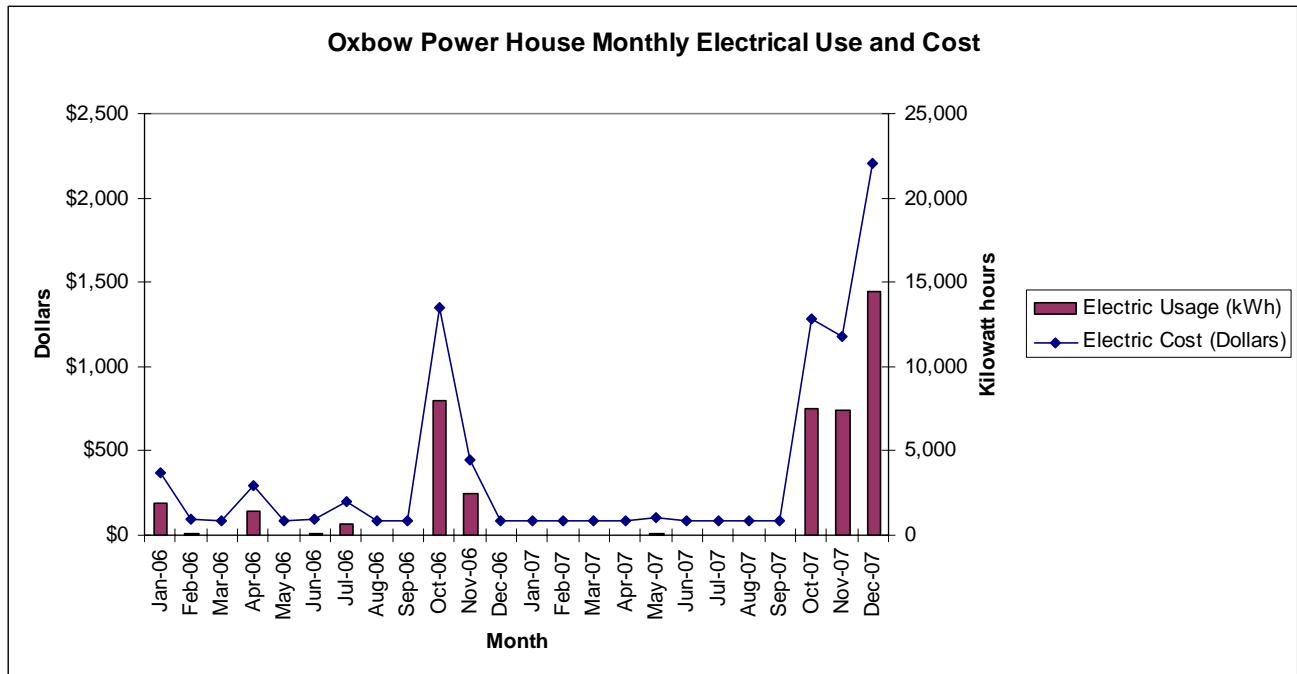
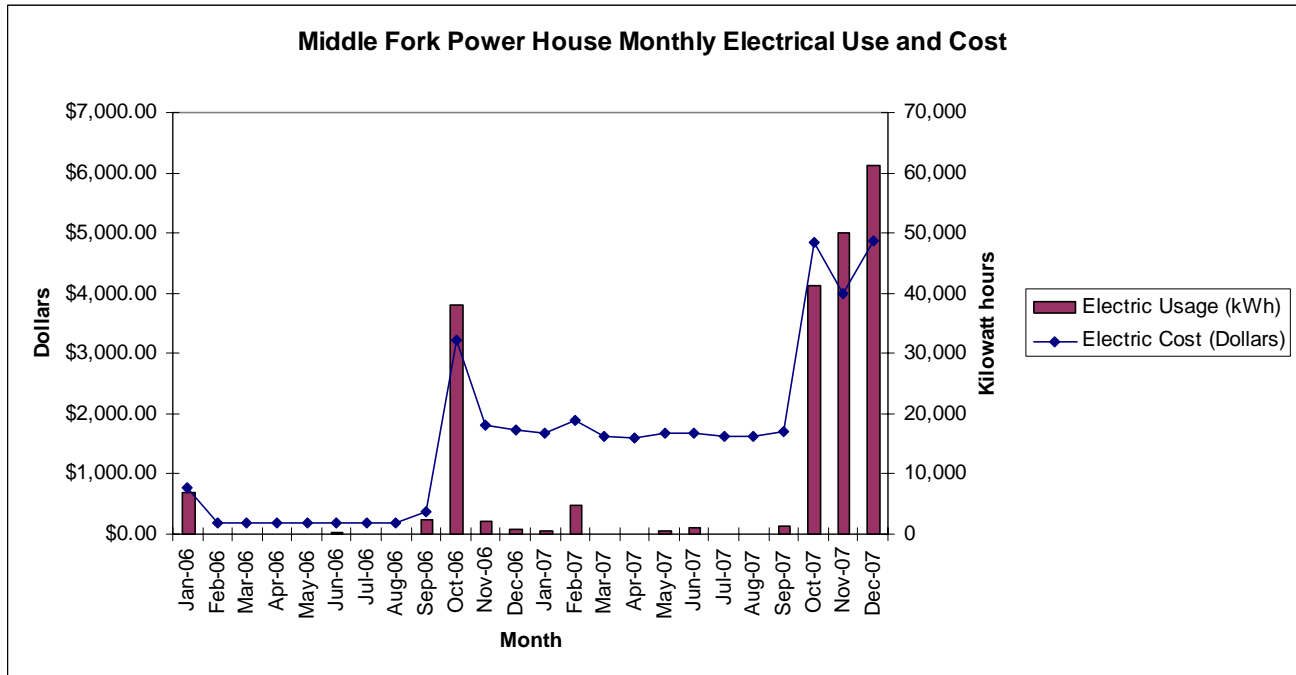
Appendix C: Electricity Use and Cost by Month



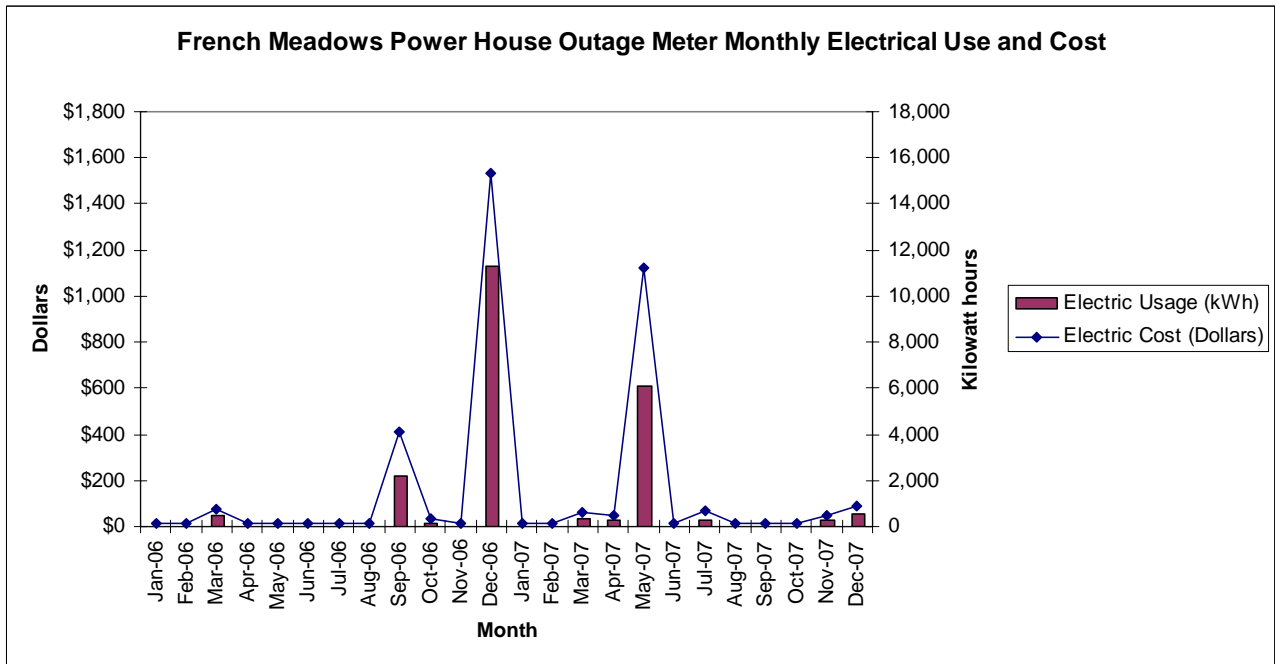
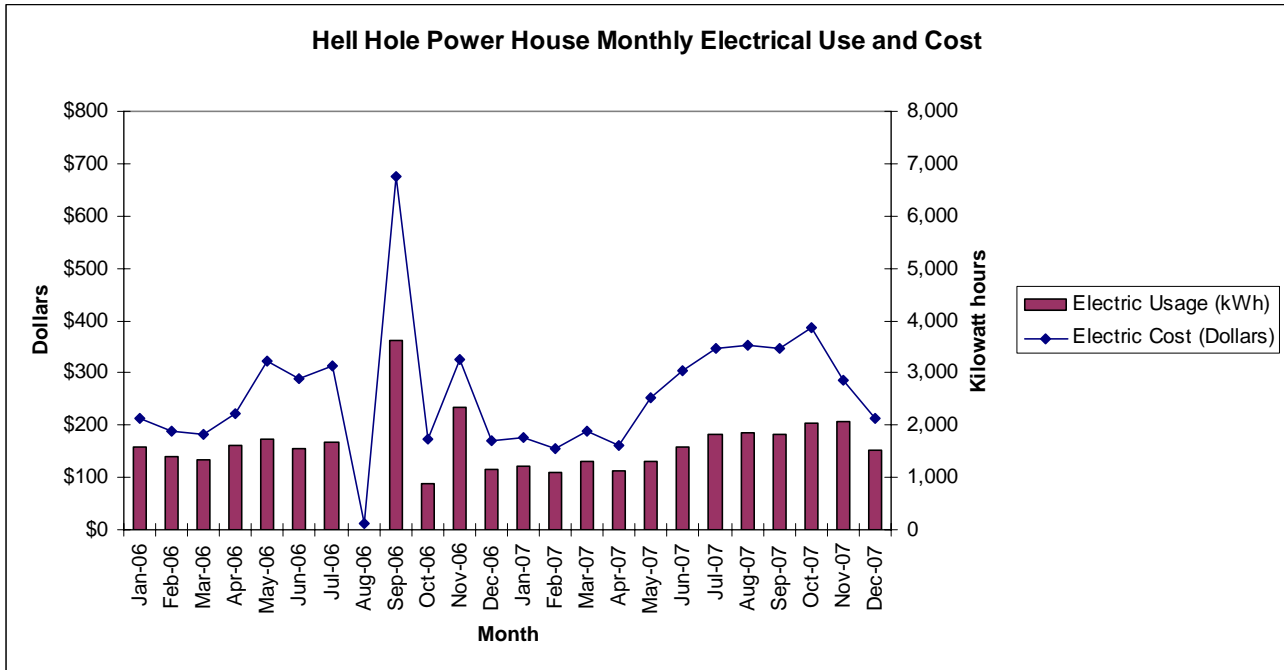
Appendix C: Electricity Use and Cost by Month



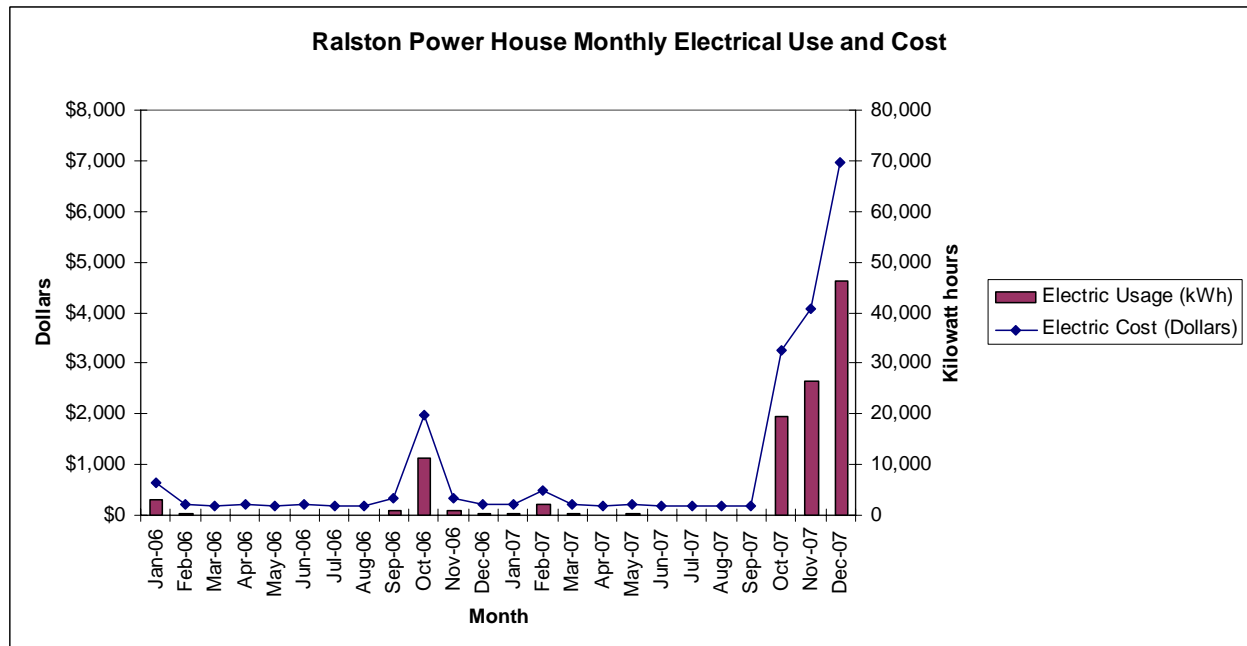
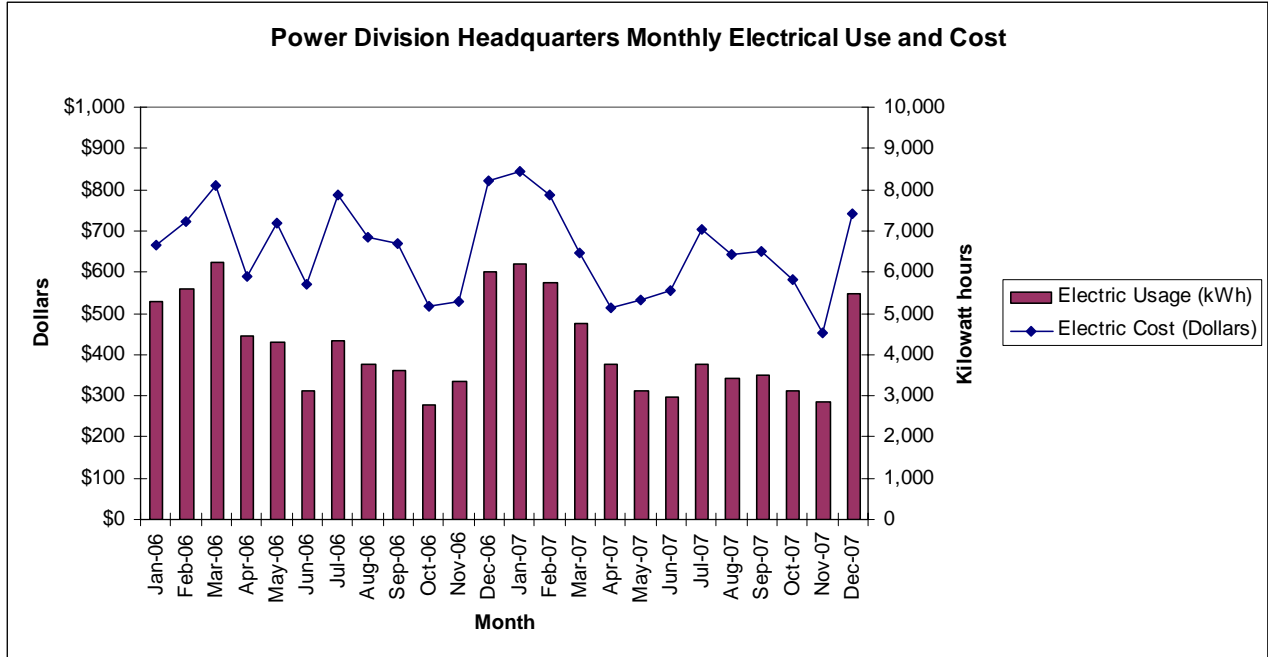
Selected Facilities from the Power Division Category



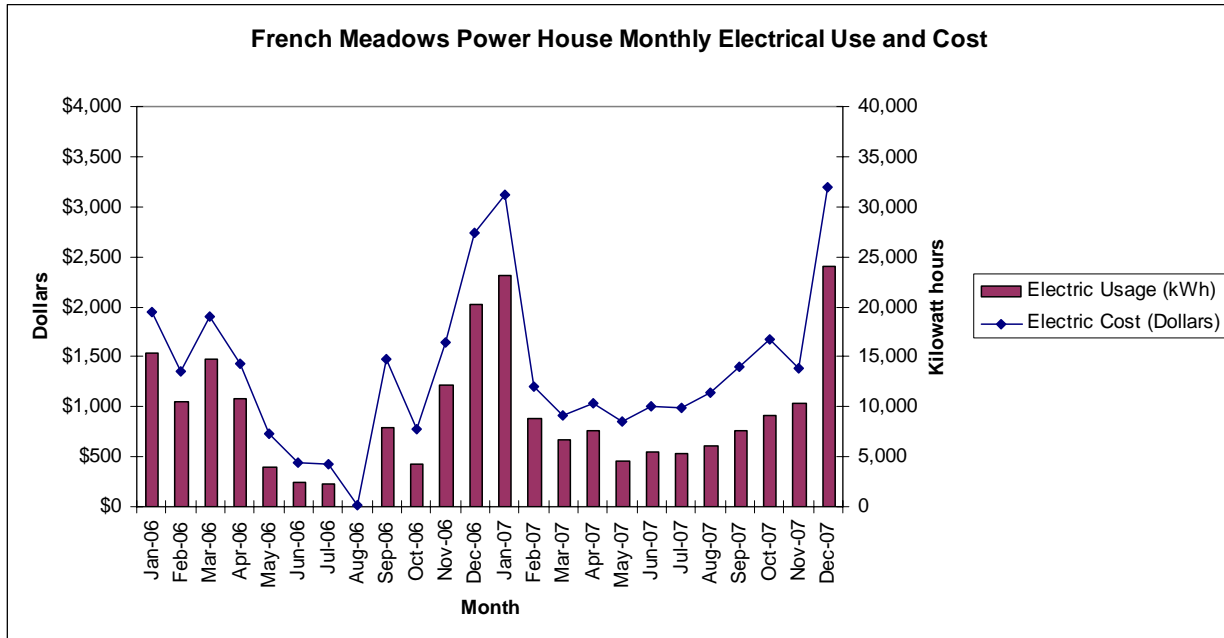
Appendix C: Electricity Use and Cost by Month



Appendix C: Electricity Use and Cost by Month



Appendix C: Electricity Use and Cost by Month



APPENDIX D: PG&E AND SIERRA PACIFIC RATE SCHEDULES

Appendix D
Pacific Gas and Electrical
Rate Schedules

Rate Schedule	Title
E-1	Residential Services
E-3	Experimental Residential Critical Peak Pricing Service
EE	Service to Company Employees
EM	Master-Metered Multifamily Service
ES	Multifamily Service
ESR	Residential RV Park and Residential Marina Service
ET	Mobilehome Park Service
E-6	Residential Time-of-Use Service
E-7	Residential Time-of-Use Service
E-A7	Experimental Residential Alternate Peak Time-of-Use Service
E-8	Residential Seasonal Service Option
E-9	Customers
EL-1	Residential CARE Program Service
EML	Master-Metered Multifamily CARE Program Service
ESL	Multifamily CARE Program Service
ESRL	Residential RV Park and Residential Marina CARE Program Service
ETL	Mobilehome Park CARE Program Service
EL-6	Residential CARE Program Time-of-Use Service
EL-7	Residential CARE Program Time-of-Use Service
EL-A7	Service
EL-8	Residential Seasonal CARE Program Service Option
E-FERA	Family Electric Rate Assistance
E-RSMART	Residential Smartrate Program
A-1	Small General Service
A-6	Small General Time-of-Use Service
A-10	Medium General Demand-Metered Service
A-15	Direct-Current General Service
E-19	Medium General Demand-Metered TOU Service
E-20	Service to Customers with Maximum Demands of 1000 Kilowatts or More
E-31	Distribution Bypass Deferral Rate
E-37	Extraction Customers
ED	Experimental Economic Development Rate
E-CARE	Agricultural Employee Housing Facilities
E-CSMART	Commercial Smartrate Program
E-PWF	Section 399.20 PPA
E-SRG	Small Renewable Generator PPA
E-CSAC	Commercial Smart A/C Program
E-PEAKCHOICE	PeakChoice
LS-1	PG&E-Owned Street and Highway Lighting
LS-2	Customer-Owned Street and Highway Lighting
LS-3	Customer-Owned Street and Highway Lighting Electrolier Meter Rate

Appendix D
Pacific Gas and Electrical
Rate Schedules

Rate Schedule	Title
TC-1	Traffic Control Service
OL-1	Outdoor Area Lighting Service
S	Standby Service
E-DCG	Departing Customer Generation CG
E-DEPART	Departing Customers
E-NWDL	New WAPA Departing Load
E-NMDL	New Municipal Departing Load
E-LORMS	Limited Optional Remote Metering Service
E-RRB	Rate Reduction Bonds Bill Credit and Fixed Transition Amount
E-SDL	Split-Wheeling Departing Load
E-TMDL	Transferred Municipal Departing Load
NEM	Net Energy Metering Service
NEMFC	Net Energy Metering Service for Fuel Cell Customer-Generators
NEMBIO	Net Energy Metering Service for Biogas Customer-Generator
E-ERA	Energy Rate Adjustments
AG-1	Agricultural Power
AG-R	Split-Week Time-of-Use Agricultural Power
AG-V	Short-Peak Time-of-Use Agricultural Power
AG-4	Time-of-Use Agricultural Power
AG-5	Large Time-of-Use Agricultural Power
AG-ICE	Agricultural Internal Combustion Engine Conversion Incentive Rate
E-CREDIT	Revenue Cycle Services Credits
E-DASR	Direct Access Services Request Fees
E-ESP	Services to Energy Services Providers
E-ESPNDSF	Energy Service Provider Non-Discretionary Service Fees
E-EUS	End User Service
DA-CRS	Direct Access Cost Responsibility Surcharge
TBCC	Transitional Bundled Commodity Cost
E-CS	ClimateSmart
E-CCA	Services to Community Choice Aggregators
CCA-CRS	Community Choice Aggregation Cost Responsibility Surcharge (Interim)
E-CCAINFO	Information Release to Community Choice Providers
E-BIP	Base Interruptible Program
E-OBMC	Optional Binding Mandatory Curtailment Plan
E-SLRP	Scheduled Load Reduction Program
E-DBP	Demand Bidding Program
E-POBMC	Pilot Optional Binding Mandatory Curtailment Plan
E-CPP	Critical Peak Pricing Program
EZ-2020	California 20/20 Rebate Program
E-BEC	Business Energy Coalition
E-CBP	Capacity Bidding Program

Appendix D
Pacific Gas and Electrical
Rate Schedules

Rate Schedule	Title
E-RSAC	Residential Smart A/C Program
E-FFS	Franchise Fee Surcharge
E-AMDS	Schedule E-AMDS Experimental Access to Meter Data Services

Appendix D

Sierra Pacific Electrical Rate Schedules

California Rate Schedules

Schedule No.	Schedule Name
D-1	Domestic Service
CARE	CARE Domestic Service
DS-1	Multi-Unit Domestic Service-Submetered
DM-1	Multi-Unit Domestic Service-Not Submetered
DE	Domestic Service to Company Employees
EXPCARE	Expanded CARE
A-1	Small General Service
A-2	Medium General Service
A-3	Large General Service
PA	Optional Interruptible Irrigation Service
SL/OL	Street and Outdoor Lighting
SE	Service Establishment Charges
CSPP	Cogeneration and Small Power Production
RF	Surcharge
DAS	Direct Access Service Charges
FTA	Fixed Transition Amount
RRB	Rate Reduction Bonds
NEM	New Metering Service
WATER	Scheduled Water
DA-RCSC	Direct Access Revenue Cycle Services Credits

APPENDIX E: GREENHOUSE GAS EMISSION CALCULATIONS

Appendix E
Greenhouse Gas Emission Calculations

Summary of Emissions

Emission Source Type		2006				2007				
		CO2 (CO2 in Metric Tons)	CH4 (CO2 Equivalent in Metric Tons)	N2O (CO2 Equivalent in Metric Tons)	Total (Metric Tons CO2 Equivalent)	CO2 (CO2 in Metric Tons)	CH4 (CO2 Equivalent in Metric Tons)	N2O (CO2 Equivalent in Metric Tons)	Total (Metric Tons CO2 Equivalent)	
Water Services	On Road	715.1	1.6	32.2	749	800.1	1.8	38.9	841	
	Off Road	29.4	de minimis	de minimis	29	31.2	de minimis	de minimis	31	
	Portable	10.0	de minimis	de minimis	10	5.4	de minimis	de minimis	5	
	Inactive - Vehicle	132.1	0.4	8.0	140	68.2	0.2	4.2	73	
	Inactive - Portable	1.3	de minimis	de minimis	1	1.0	de minimis	de minimis	1	
	Fuel Cans	27.6	de minimis	de minimis	28	27.9	de minimis	de minimis	28	
	Small Engines	de minimis	de minimis	de minimis	0	13.3	de minimis	de minimis	13	
Power Services	On Road	126.8	0.2	3.7	131	158.8	0.3	7.0	166	
	Off Road	10.2	0.0	0.0	10	11.7	0.0	0.0	12	
	Generators & Misc	4.9	0.0	0.0	5	3.1	0.0	0.0	3	
	Misc Equipment	de minimis	de minimis	de minimis	0	de minimis	de minimis	de minimis	0	
Natural Gas		98.0	0.2	0.1	98	137.4	0.3	0.1	138	
Propane		20.0	0.0	0.0	20	9.4	0.0	0.0	9	
Emergency Generators		26.0	de minimis	de minimis	26	10.0	de minimis	de minimis	10	
Electricity		1,139.2	-	-	1,139	1,825.3	-	-	1,825	
Tetrafluorethane in Vehicle Maintenance		na	na	na	5	na	na	na	2	
Total 2006 GHG Emissions (Metric Tons):					2,392	Total 2007 GHG Emissions (Metric Tons):				3,158

Appendix E
Greenhouse Gas Emission Calculations

Water Services On-Road Emissions Calculations

Model Year	Vehicle	GVWR	Fuel Type	2006 Mileage	2006 Fuel (gal)	2007 Mileage	2007 Fuel (gal)	CO2/Gal (Kg CO2 / Gal)	2006 CO2 / Year (Kg)	2007 CO2 / Year (Kg)	CH4/mile (g/mile)	2006 CH4 / Year (grams)	2007 CH4 / Year (grams)	CO2 Equivalent / Year (21:1)	2006 CH4 GWP (Kg)	2007 CH4 GWP (Kg)	N2O/mile (g/mile)	2006 N2O / Year (grams)	2007 N2O / Year (grams)	N2O Equivalent / Year (310:1)	2006 N2O GWP (Kg)	2007 N2O GWP (Kg)	Total 2006 CO2 GWP	Total 2007 CO2 GWP
1997	K3500 4X4 STD CAB SWB	More than 5750	Diesel	2880	312.7	5148	563.8	10.15	3,174	5,723	0.06	173	309	21	4	6	0.05	144	257	310	45	80	3,222	5,809
1997	K3500 4X4 XTR CAB LWB	More than 5750	Diesel	8002	830.1	2930	311.3	10.15	8,426	3,160	0.06	480	176	21	4	4	0.05	400	147	310	124	45	8,560	3,209
1999	F-350 4X4 STD CAB SWB	More than 5750	Diesel	9174	825.9	7665	697.7	10.15	8,383	7,082	0.06	550	460	21	12	10	0.05	459	383	310	142	119	6,537	7,210
1999	F-350 4X4 STD CAB SWB	More than 5750	Diesel	18848	1762.8	18634	1827.7	10.15	17,892	18,551	0.06	1,131	1,118	21	24	23	0.05	942	932	310	292	289	18,233	18,863
2000	4700 2WD 5YD DMP	More than 5750	Diesel	3634	448.3	1935	266.2	10.15	4,550	2,702	0.06	218	116	21	5	2	0.05	182	97	310	56	30	4,611	2,734
2001	F-450 4X4 STD CAB LWB	More than 5750	Diesel	8913	1018	9690	1069.76	10.15	10,333	10,858	0.06	535	581	21	11	12	0.05	446	485	310	138	150	10,482	11,020
2001	F-450 4X4 STD CAB LWB	More than 5750	Diesel	9285	1014.52	8472	966.02	10.15	10,297	9,805	0.06	557	508	21	12	11	0.05	464	424	310	144	131	10,453	9,947
2001	F-450 4X4 STD CAB SWB	More than 5750	Diesel	12406	1343.5	10407	1121.4	10.15	13,637	11,382	0.06	744	624	21	16	13	0.05	620	520	310	192	161	13,844	11,557
2001	F-450 4X4 STD CAB SWB	More than 5750	Diesel	15368	1650.8	11898	1265.8	10.15	16,756	12,076	0.06	922	615	21	19	13	0.05	768	512	310	238	159	17,013	12,248
2001	F-450 4X4 STD CAB SWB	More than 5750	Diesel	13776	1526.6	9744	1096.9	10.15	15,495	11,134	0.06	827	585	21	17	12	0.05	689	487	310	214	151	15,726	11,297
2001	F-450 4X4 STD CAB SWB	More than 5750	Diesel	18977	2050.6	18938	1958	10.15	20,814	19,874	0.06	1,139	1,136	21	24	24	0.05	949	947	310	294	294	21,132	20,194
2001	F-650 2WD STD CAB LNB	More than 5750	Diesel	5304	632.9	2808	376.3	10.15	6,424	3,819	0.06	318	168	21	7	4	0.05	265	140	310	82	44	6,513	3,867
2002	F-450 4X4 STD CAB SWB	More than 5750	Diesel	19736	2008.4	26393	2619.7	10.15	20,385	26,590	0.06	1,184	1,584	21	25	33	0.05	987	1,320	310	306	409	20,716	27,032
2002	F-450 4X4 STD CAB SWB	More than 5750	Diesel	17832	1867.6	17086	1833.2	10.15	18,956	18,607	0.06	1,070	1,025	21	22	22	0.05	892	854	310	276	265	19,255	18,893
2002	LT9511 6X4 10-12Y DMP	More than 5750	Diesel	7645	1617.4	9043	1855.2	10.15	16,417	18,530	0.06	459	543	21	10	11	0.05	382	452	310	118	140	16,545	18,982
2003	F-450 4X4 STD CAB SWB	More than 5750	Diesel	21961	2172.4	20591	2108	10.15	22,050	21,396	0.06	1,318	1,235	21	28	26	0.05	1,098	1,030	310	340	319	22,418	21,741
2004	C8500 2WD 5YD DUMP	More than 5750	Diesel	4193	865.8	5695	1173.2	10.15	8,788	11,908	0.06	252	342	21	5	7	0.05	210	285	310	65	88	8,863	12,003
2004	F-450 4X4 STD CAB SWB	More than 5750	Diesel	12434	1403.5	9992	1131.6	10.15	14,246	11,486	0.06	746	600	21	16	13	0.05	622	500	310	193	155	14,454	11,653
2005	C8500 2WD 5YD DUMP	More than 5750	Diesel	7894	1340.7	8805	1456.4	10.15	13,608	14,782	0.06	474	528	21	10	11	0.05	395	440	310	122	136	13,740	14,930
2005	F-350 4X4 X-CAB	More than 5750	Diesel	13545	1026	15373	1101.8	10.15	10,414	11,183	0.06	813	922	21	17	19	0.05	677	769	310	210	238	10,641	11,441
2005	F-450 4X4 STD CAB SWB	More than 5750	Diesel	22208	2040.9	18211	1687.5	10.15	20,715	17,128	0.06	1,332	1,093	21	28	23	0.05	1,110	911	310	344	282	21,087	17,433
2006	F-450 4X4 STD CAB SWB	More than 5750	Diesel	14406	1464.7	12930	1417	10.15	14,867	14,383	0.06	864	776	21	18	16	0.05	720	647	310	223	200	15,108	14,599
2007	F-450 4X4 STD CAB SWB	More than 5750	Diesel	10383	965.38	1015	0	10.15	0	9190	0.06	0	623	21	0	13	0.05	0	519	310	0	161	0	9,364
2007	F-450 4X4 STD CAB SWB	More than 5750	Diesel	7644	848.4	1015	0	10.15	0	8,611	0.06	0	459	21	0	10	0.05	0	382	310	0	118	0	8,734
2008	F-350 4X4 X-CAB	More than 5750	Diesel	248	22.6	1015	0	10.15	0	229	0.06	0	15	21	0	0	0.05	0	12	310	0	4	0	234
2008	F-450 4X4 SWB	More than 5750	Diesel	99.2	0	10.15	0	10.15	0	0	0.06	0	0	21	0	0	0.05	0	0	310	0	0	0	0
2008	F-550 FLATBED / STAKE	More than 5750	Diesel	750	99.2	10.15	0	10.15	0	0	0.06	0	45	21	0	1	0.05	0	38	310	0	12	0	1,019
2008	FREIGHTLINER 10 YD DUMP	More than 5750	Diesel	10.15	0	10.15	0	10.15	0	0	0.06	0	0	21	0	0	0.05	0	0	310	0	0	0	0
1992	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	3156	181.3	2766	163.8	8.81	1,597	1,443	0.09	284	249	21	6	5	0.11	347	304	310	108	94	1,711	1,543
1998	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	6045	405.56	6011	418.69	8.81	3,573	3,689	0.06	363	361	21	8	8	0.06	363	361	310	112	112	3,693	3,908
1998	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	13140	839.1	13188	763.79	8.81	7,392	6,729	0.06	788	791	21	17	17	0.06	788	791	310	244	245	7,653	6,991
1998	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	10009	805.59	9624	685.6	8.81	7,097	6,040	0.06	601	577	21	13	12	0.06	601	577	310	186	179	7,286	6,231
1999	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	20166	1199.97	14892	956.5	8.81	10,572	8,427	0.06	1,210	894	21	25	19	0.06	1,210	894	310	375	277	10,972	8,723
1999	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	4643	280.5	3354	220.95	8.81	2,471	1,947	0.06	279	201	21	6	4	0.06	279	201	310	86	62	2,563	2,013
2000	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	15320	1270.8	19553	1467.53	8.81	11,196	12,929	0.05	786	978	21	16	21	0.06	919	1,173	310	285	364	11,497	13,313
2000	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	8540	560.5	7302	489.5	8.81	4,938	4,312	0.05	427	365	21	9	8	0.06	512	438	310	159	136	5,108	4,456
2000	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	18055	1181.1	11860	784.1	8.81	10,405	6,908	0.05	903	593	21	19	12	0.06	1,083	712	310	336	221	10,760	7,141
2000	RANGER 4X4 XTR CAB UTL	Less than 5750	Unleaded	12841	1030.2	15596	1376.92	8.81	9,076	12,131	0.05	642	780	21	13	16	0.06	770	936	310	239	290	9,328	12,437
2001	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	19205	1371.42	18183	1236.29	8.81	12,082	10,892	0.05	960	909	21	20	19	0.06	1,152	1,091	310	357	338	12,460	11,249
2001	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	24087	1509.03	23563	1501.71	8.81	13,295	13,230	0.05	1,204	1,178	21	25	25	0.06	1,445	1,414	310	448	438	13,768	13,693
2001	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	13913	1028.3	15441	1146.91	8.81	9,068	10,104	0.05	696	772	21	15	16	0.06	835	926	310	259	267	9,342	10,408
2002	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	10584	683.91	12809	792.73	8.81	6,025	6,984	0.05	529	640	21	11	13	0.06	635	789	310	197	238	6,233	7,236
2003	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	7553	660.82	14377	1277.46	8.81	5,822	11,254	0.05	378	719	21	8	15	0.06	453	863	310	140	267	5,970	11,537
2004	TRAILBLAZER 4X4 SUV	Less than 5750	Unleaded	13469	858.5	13216	840.94	8.81	7,563	7,409	0.05	673	661	21	14	14	0.06	808	793	310	251	246	7,828	7,668
2005	RANGER 4X4 X-CAB	Less than 5750	Unleaded	22897	1373.02	9884	652.95	8.81	12,096	5,752	0.05	1,135	494	21	24	10	0.06	1,362	593	310	422	184	12,542	5,947
2007	RANGER 4X4 X-CAB	Less than 5750	Unleaded	9192	589.74	8.81	0	10.15	0	5,196	0.05	0	460	21	0	10	0.06	0	552	310	0	171	0	5,376
2007	RANGER 4X4 XTR CAB	Less than 5750	Unleaded	3713	239.1	11070	694.82	8.81	2,106	6,121	0.05	186	554	21	4	12	0.06	223	664	310	69	206	2,179	6,339
1992	F-350 4X4 CRV CAB SRW	More than 5750	Unleaded	2833	420	2363	327	8.81	3,700	2,881	0.12	340	284	21	7	6	0.2	567	473	310	176	147	3,893	3,033
1996	K1500 4X4 STD CAB	More than 5750	Unleaded	13712	1070.39	9044	714.2	8.81	9,430	6,292	0.12	1,645	1,085	21	35	23	0.2	2,742	1,809	310	850	561	10,315	6,876
1997	F-150 4X4 XTR CAB	More than 5750	Unleaded	16965	1245.7	13506	1054.4	8.81	10,975	9,289	0.12	2,036	1,621	21	43	34	0.2	3,393	2,701	310	1,052	897	12,069	10,161
1997	F-350 4X4 STD CAB SWB	More than 5750	Unleaded	9688	1481.1	8136	1256.6	8.81	13,048	11,071	0.12	1,163	976	21	24	21	0.2	1,938	1,627	310	601	504	13,674	11,596
1997	F-350 4X4 STD CAB SWB	More than 5750																						

Water Services On-Road Emissions Calculations

Model Year	Vehicle	GVWR	Fuel Type	2006 Mileage	2006 Fuel (gal)	2007 Mileage	2007 Fuel (gal)	CO2/Gal (Kg CO2 / Gal)	2006 CO2 / Year (Kg)	2007 CO2 / Year (Kg)	CH4/mile (g/mile)	2006 CH4 / Year (grams)	2007 CH4 / Year (grams)	CO2 Equivalent / Year (21:1)	2006 CH4 GWP (Kg)	2007 CH4 GWP (Kg)	N2O/mile (g/mile)	2006 N2O / Year (grams)	2007 N2O / Year (grams)	N2O Equivalent / Year (310:1)	2006 N2O GWP (Kg)	2007 N2O GWP (Kg)	Total 2006 Kg CO2 GWP	Total 2007 Kg CO2 GWP		
2001	F-150 4X4 XTR CAB	More than 5750	Unleaded	9610	798.7	8648	764.4	8.81	7,037	6,734	0.12	1,153	1,038	21	24	22	0.2	1,922	1,730	310	596	536	7,657	7,292		
2001	F-150 4X4 XTR CAB	More than 5750	Unleaded	11478	1063.5	10828	1034	8.81	9,369	9,110	0.12	1,377	1,299	21	29	27	0.2	2,296	2,166	310	712	671	10,110	9,808		
2001	F-150 4X4 XTR CAB	More than 5750	Unleaded	3805	248.4	5090	399.8	8.81	2,188	3,522	0.12	457	611	21	10	13	0.2	761	1,018	310	236	316	2,434	3,851		
2002	EXPLR 4X4 4DR SUV	More than 5750	Unleaded	2061	131.2	2445	158.3	8.81	1,156	1,395	0.12	247	293	21	5	6	0.2	412	489	310	128	152	1,269	1,552		
2002	F-150 4X4 STD CAB	More than 5750	Unleaded	29139	2292.1	18908	1563.9	8.81	20,193	13,778	0.12	3,497	2,269	21	73	48	0.2	5,828	3,782	310	1,807	1,172	22,073	14,998		
2002	F-150 4X4 STD CAB	More than 5750	Unleaded	12653	1203.8	15555	1518.62	8.81	10,605	13,379	0.12	1,518	1,867	21	32	39	0.2	2,531	3,111	310	784	964	11,422	14,383		
2003	E-150 2WD CAR VAN	More than 5750	Unleaded	12516	945.48	14828	1100.11	8.81	8,330	9,692	0.12	1,502	1,779	21	32	37	0.2	2,503	2,966	310	776	919	9,137	10,649		
2003	F-150 4X4 XTR CAB	More than 5750	Unleaded	13451	1096.2	13370	1149	8.81	9,658	10,123	0.12	1,614	1,604	21	34	34	0.2	2,690	2,674	310	834	829	10,525	10,988		
2003	F-150 4X4 XTR CAB	More than 5750	Unleaded	20219	1601.95	21781	1622.82	8.81	14,113	14,297	0.12	2,426	2,614	21	51	55	0.2	4,044	4,356	310	1,254	1,350	15,418	15,702		
2003	F-150 4X4 XTR CAB	More than 5750	Unleaded	7042	641.8	5712	522.3	8.81	5,654	4,601	0.12	845	685	21	18	14	0.2	1,408	1,142	310	437	354	6,109	4,970		
2004	EXPLR 4X4 4DR SUV	More than 5750	Unleaded	6889	442.7	6745	392.01	8.81	3,900	3,454	0.12	627	609	21	17	17	0.2	1,378	1,349	310	427	418	4,345	3,888		
2004	EXPLR 4X4 4DR SUV	More than 5750	Unleaded	8718	516.53	7509	438.9	8.81	4,551	3,867	0.12	1,046	901	21	22	19	0.2	1,744	1,502	310	541	466	5,113	4,351		
2004	F-150 4X4 SUPERCAB SWB	More than 5750	Unleaded	22990	1836.6	21917	1718.8	8.81	16,180	15,143	0.12	2,759	2,630	21	58	55	0.2	4,598	4,383	310	1,425	1,359	17,664	16,557		
2004	F-150 4X4 SUPERCAB SWB	More than 5750	Unleaded	10711	708.5	9477	638.78	8.81	6,242	5,628	0.12	1,285	1,137	21	27	24	0.2	2,142	1,895	310	664	588	6,933	6,239		
2004	F-150 4X4 SUPERCAB SWB	More than 5750	Unleaded	15379	1253.3	11389	938.2	8.81	11,042	8,266	0.12	1,845	1,367	21	39	29	0.2	3,076	2,278	310	953	706	12,034	9,000		
2004	F-150 4X4 SUPERCAB SWB	More than 5750	Unleaded	20916	1708.7	17976	1440.7	8.81	15,054	12,693	0.12	2,510	2,157	21	53	45	0.2	4,183	3,595	310	1,297	1,115	16,403	13,852		
2004	F-150 4X4 XTR CAB	More than 5750	Unleaded	22451	1763.2	18427	1440.1	8.81	15,534	12,697	0.12	2,694	2,211	21	57	46	0.2	4,490	3,695	310	1,392	1,142	16,932	13,876		
2005	EXPLR 4X4 4DR SUV	More than 5750	Unleaded	5697	346.76	8705	564.89	8.81	3,055	4,977	0.12	684	1,045	21	14	22	0.2	1,139	1,741	310	353	540	3,422	5,538		
2005	F-150 4X4 SUPERCAB SWB	More than 5750	Unleaded	9653	633.57	7045	444.46	8.81	5,582	3,916	0.12	1,158	845	21	24	18	0.2	1,931	1,409	310	598	437	6,205	4,370		
2005	F-150 4X4 SUPERCAB SWB	More than 5750	Unleaded	7973	600.5	8090	608.8	8.81	5,290	5,364	0.12	957	970	21	20	20	0.2	1,595	1,616	310	494	501	5,805	5,885		
2006	F-250 4X4 X-CAB	More than 5750	Unleaded	12087	1174.69	11866	1132.77	8.81	10,349	9,980	0.12	1,450	1,424	21	30	30	0.2	2,417	2,373	310	749	736	11,129	10,745		
2007	2007 SPORT TRAC	More than 5750	Unleaded			16397	1072.12	8.81	0	9,445	0.12	0	1,968	21	0	41	0.2	0	3,279	310	0	1,017	0	10,503	0	
2007	EXPLORER 4X4	More than 5750	Unleaded			2925	156.2	8.81	0	1,376	0.12	0	243	21	0	5	0.2	0	405	310	0	126	0	1,507	0	
2007	EXPLORER 4X4	More than 5750	Unleaded			2589	121.55	8.81	0	1,071	0.12	0	311	21	0	7	0.2	0	518	310	0	161	0	1,238	0	
2007	F-150 4X4 STD CAB SWB	More than 5750	Unleaded			14145	1053.2	8.81	0	9,279	0.12	0	1,697	21	0	36	0.2	0	2,829	310	0	877	0	10,191	0	
2007	F-150 4X4 STD CAB SWB	More than 5750	Unleaded			12225	998.2	8.81	0	8,794	0.12	0	1,467	21	0	31	0.2	0	2,445	310	0	758	0	9,583	0	
2007	F-150 4X4 STD CAB SWB	More than 5750	Unleaded			8144	547.12	8.81	0	4,820	0.12	0	977	21	0	21	0.2	0	1,629	310	0	505	0	5,346	0	
2007	F-150 4X4 STD CAB SWB	More than 5750	Unleaded			12900	984.2	8.81	0	8,671	0.12	0	1,548	21	0	33	0.2	0	2,580	310	0	800	0	9,503	0	
2007	F-150 4X4 STD CAB SWB	More than 5750	Unleaded			10139	929.8	8.81	0	8,192	0.12	0	1,217	21	0	26	0.2	0	2,028	310	0	629	0	8,846	0	
2007	F-150 4X4 SWB	More than 5750	Unleaded	3005	252.5	11404	1131.29	8.81	2,225	9,967	0.12	361	1,368	21	8	29	0.2	601	2,281	310	186	707	2,418	10,702		
2007	F-150 4X4 SWB	More than 5750	Unleaded	3386	288.1	10616	908.7	8.81	2,538	8,006	0.12	406	1,274	21	9	27	0.2	677	2,123	310	210	658	2,757	8,691		
2007	F-150 4X4 XTR CAB	More than 5750	Unleaded	1964	164.1	15953	1256.76	8.81	1,446	11,072	0.12	236	1,914	21	5	40	0.2	393	3,191	310	122	989	1,572	12,101		
2007	F-250 4X4 STD CAB	More than 5750	Unleaded			8952	933.5	8.81	0	8,224	0.12	0	1,074	21	0	23	0.2	0	1,790	310	0	555	0	8,802	0	
2008	F-250 4X4 X-CAB	More than 5750	Unleaded			6124	601.1	8.81	0	5,296	0.12	0	735	21	0	15	0.2	0	1,225	310	0	380	0	5,691	0	
2008	F-350 4X4 CREW CAB	More than 5750	Unleaded					8.81	0	0	0.12	0	0	0	0	0	0.2	0	0	310	0	0	0	0	0	0
Number of Vehicles 94				Total Diesel (gal)	29,224.12		29,704.06	Total CO2 (kg)	715,090	800,116	Total CH4 (g)	74,031	87,087	GWP equiv	1,555	1,829	Total N2O (g)	103,712	125,415	GWP equiv	32,151	38,879	748,796	840,824		
				Total Unleaded (gal)	47,498.92		56,597.04	Total CO2 (metric tons)	715.1	800.1						1.6	1.8					32.2	38.9	749	841	

- Notes:
1. Vehicles are classified as heavy duty trucks according to their GVWR. Emission factors were used accordingly
2. All factors from CCAR Protocol Version 3.0 April 2008 except electricity.

Appendix E
Greenhouse Gas Emission Calculations

Water Services Off-Road Emissions Calculations

Model Year	Vehicle	Fuel Type	2006 Hours	2006 Fuel (gal)	2007 Hours	2007 Fuel (gal)	CO2/Gal (Kg CO2 / Gal)	2006 CO2 / Year (Kg)	2007 CO2 / Year (Kg)	CH4/gallon (kg/gal)	2006 CH4 / Year (kg)	2007 CH4 / Year (kg)	CO2 Equivalent / Year (21:1)	2006 CH4 GWP (Kg)	2007 CH4 GWP (Kg)	N2O/gallon (kg/gal)	2006 N2O / Year (kg)	2007 N2O / Year (kg)	N2O Equivalent / Year (310:1)	2006 N2O GWP (Kg)	2007 N2O GWP (Kg)	Total 2006 CO2 GWP	Total 2007 CO2 GWP
1995	510D 4X4 BACKHOE/LOADER	Diesel	278	368.6	184	252.6	10.15	3,741	2,564		0	0	21	0	0		0	0	310	0	0	3,741	2,564
1999	GATOR 6X4 DSL UTILITY VEH	Diesel	44	7.7	12	2	10.15	78	20		0	0	21	0	0		0	0	310	0	0	78	20
2000	240 SKID-STEER	Diesel	47	57.1	26	36.2	10.15	580	367		0	0	21	0	0		0	0	310	0	0	580	367
2000	444H 4WD WHEEL LOADER	Diesel	221	451.4	274	398.1	10.15	4,582	4,041		0	0	21	0	0		0	0	310	0	0	4,582	4,041
2001	352TS MINI-EXCAVATOR	Diesel	418	359.5	310	316.7	10.15	3,649	3,215		0	0	21	0	0		0	0	310	0	0	3,649	3,215
2002	272TS MINI-EXCAVATOR	Diesel	345	259.6	128	81.6	10.15	2,635	828		0	0	21	0	0		0	0	310	0	0	2,635	828
2003	410G 4X4 BACKHOE/LOADER	Diesel	245	476.9	359	685.6	10.15	4,841	6,959		0	0	21	0	0		0	0	310	0	0	4,841	6,959
2003	GP060TG FORKLIFT	Diesel	190	17.4	861	6.7	10.15	177	68		0	0	21	0	0		0	0	310	0	0	177	68
2004	J.D. LANDSCAPE LOADER	Diesel	103	108.1	135	213.7	10.15	1,097	2,169		0	0	21	0	0		0	0	310	0	0	1,097	2,169
2005	410G 4X4 BACKHOE/LOADER	Diesel	223	383.6	228	415	10.15	3,894	4,212		0	0	21	0	0		0	0	310	0	0	3,894	4,212
2005	6420 4X4 TRACTOR & MOWERS	Diesel	51	104.2	16	38.8	10.15	1,058	394		0	0	21	0	0		0	0	310	0	0	1,058	394
2006	35DZTS MINI-EXCAVATOR	Diesel	127	100.4	241	199.9	10.15	1,019	2,029		0	0	21	0	0		0	0	310	0	0	1,019	2,029
2005	303CR MINI-EXCAVATOR	Diesel	74	72.8	254	259.4	10.15	739	2,633		0	0	21	0	0		0	0	310	0	0	739	2,633
2006	YALE FORKLIFT 60VX	Diesel					10.15	0	0		0	0	21	0	0		0	0	310	0	0	0	0
2007	75C EXCAVATOR	Diesel					10.15	0	0		0	0	21	0	0		0	0	310	0	0	0	0
2007	410J 4X4 BACKHOE/LOADER	Diesel					10.15	0	0		0	0	21	0	0		0	0	310	0	0	0	0
2007	FORKLIFT LP	LP						0	0		0	0	21	0	0		0	0	310	0	0	0	0
1984	40-4FG20 4000 LB FORKLIFT	Unleaded	71	68.2	92	84	8.81	601	740	0.0013	0	0	21	2	2	0.0001	0	0	310	2	3	605	745
1977	WG64WTSR 6000LB FORKLIFT	Unleaded			33	15.8	8.81	0	139	0.0013	0	0	21	0	0	0.0001	0	0	310	0	0	0	140
1963	FTPF-60 6000 LB FORKLIFT	Unleaded	46	53.6	53	64.9	8.81	472	572	0.0013	0	0	21	1	2	0.0001	0	0	310	2	2	475	576
2003	6X6 UTILITY ATV	Unleaded	39	8.1	37	6	8.81	71	53	0.0013	0	0	21	0	0	0.0001	0	0	310	0	0	72	53
2003	GATOR 6X4 UTILITY VEH	Unleaded	24	16.9	102	4	8.81	149	35	0.0013	0	0	21	0	0	0.0001	0	0	310	1	0	150	35
2006	JLG 400S MANLIFT	Unleaded			1	14.3	8.81	0	126	0.0013	0	0	21	0	0	0.0001	0	0	310	0	0	0	127
			Total Diesel	2,767.30		2,906.30	Total CO2 (kg)	29,381	31,164	Total CH4 (g)	0	0	GWP equiv	4	5	Total N2O (g)	0	0	GWP equiv	5	6	29,390	31,175
			Total Unleaded	146.80		189.00	Total CO2 (metrictons)	29.4	31.2				0.0	0.0					0.0	0.0		29	31

- Notes:**
1. Vehicles are classified as heavy duty trucks according to their GVWR. Emission factors were used accordingly
2. All factors from CCAR Protocol Version 3.0 April 2008 except electricity.

Water Services Portable Equipment Emissions Calculations

Model Year	Vehicle	Fuel Type	2006 Hours	2006 Fuel (gal)	2007 Hours	2007 Fuel (gal)	CO2/Gal (Kg CO2 / Gal)	2006 CO2 / Year (Kg)	2007 CO2 / Year (Kg)	CH4/gallon (kg/gal)	2006 CH4 / Year (kg)	2007 CH4 / Year (kg)	CO2 Equivalent / Year (21:1)	2006 CH4 GWP (Kg)	2007 CH4 GWP (Kg)	N2O/gallon (kg/gal)	2006 N2O / Year (kg)	2007 N2O / Year (kg)	N2O Equivalent / Year (310:1)	2006 N2O GWP (Kg)	2007 N2O GWP (Kg)	Total 2006 CO2 GWP	Total 2007 CO2 GWP	
1996	125 KW DSL GENSET ON TRLR	Diesel					10.15	0	0	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	0	0	
1996	175 KW DSL GENSET ON TRLR	Diesel					10.15	0	0	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	0	0	
1996	50KW DSL GENSET ON TRLR	Diesel					10.15	0	0	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	0	0	
1996	50KW DSL GENSET ON TRLR	Diesel					10.15	0	0	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	0	0	
1996	50KW DSL GENSET ON TRLR	Diesel	1	17.3			10.15	176	0	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	176	0	
1993	MODEL 150 BRUSH CHIPPER	Diesel	3	5.1			10.15	52	0	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	52	0	
1965	100 GALLON FUEL TRLR	Diesel		507.4		91	10.15	5,150	924	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	5,150	924	
1999	P-185WJD AIR COMP ON TRLR	Diesel	47	102.6	45	72.4	10.15	1,041	735	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	1,041	735	
2002	P185WJD AIR/COMP/GEN	Diesel	94	159	51	87.2	10.15	1,614	885	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	1,614	885	
2005	LIGHT TOWER TRLR	Diesel		38.7	62	45	10.15	393	457	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	393	457	
2006	ASPHALT ZIPPER & TRLR	Diesel	1	22	7	12.4	10.15	223	126	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	223	126	
2006	1590 BRUSH CHIPPER	Diesel	20	29.6	6	34.7	10.15	300	352	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	300	352	
2007	P185WJD AIR COMP.	Diesel			68	106.3	10.15	0	1,079	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	0	1,079	
2007	AIR COMP. ON #01-84	Diesel					10.15	0	0	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	0	0	
2007	PUMP TRAILER	Diesel					10.15	0	0	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	0	0	
2008	LIGHT TOWER TRAILER	Diesel					10.15	0	0	0.00	0.00	0.00	21	0	0		0.00	0.00	310	0	0	0	0	
1996	WT540 540 GAL WATER TRLR	Unleaded		1.5	0.5		8.81	13	0	0.0013	0.00	0.00	21	0	0	0.0001	0.00	0.00	310	0	0	13	0	
1997	WC-92 9CU FT CEMENT MIXER	Unleaded					8.81	0	0	0.0013	0.00	0.00	21	0	0	0.0001	0.00	0.00	310	0	0	0	0	
1999	ST200 200GL SPRYR ON TRLR	Unleaded					8.81	0	0	0.0013	0.00	0.00	21	0	0	0.0001	0.00	0.00	310	0	0	0	0	
1998	WT540 540 GAL WATER TRLR	Unleaded					8.81	0	0	0.0013	0.00	0.00	21	0	0	0.0001	0.00	0.00	310	0	0	0	0	
1992	WELDER-GEN ON #01-84	Unleaded			1	2	8.81	0	18	0.0013	0.00	0.00	21	0	0	0.0001	0.00	0.00	310	0	0	0	18	
2005	MILLER TRAILBLAZER WELDER	Unleaded		10		6.9	8.81	88	61	0.0013	0.01	0.01	21	0	0	0.0001	0.00	0.00	310	0	0	88	61	
1995	WELDER-GEN ON #01-90	Unleaded	5	4.4	10	9.4	8.81	39	83	0.0013	0.01	0.01	21	0	0	0.0001	0.00	0.00	310	0	0	39	83	
2000	CP84C2PCA WINDROW SWEEPER	Unleaded	6	5			8.81	44	0	0.0013	0.01	0.00	21	0	0	0.0001	0.00	0.00	310	0	0	44	0	
2000	280NT WELDER/GEN ON 04-51	Unleaded	109	65.4	37	21.6	8.81	576	190	0.0013	0.09	0.03	21	2	1	0.0001	0.01	0.00	310	2	1	580	192	
2000	3G3HH AIR COMP ON #00-70	Unleaded					8.81	0	0	0.0013	0.00	0.00	21	0	0	0.0001	0.00	0.00	310	0	0	0	0	
2001	HGPL6 AIR COMP ON #01-89	Unleaded					8.81	0	0	0.0013	0.00	0.00	21	0	0	0.0001	0.00	0.00	310	0	0	0	0	
2001	HGPL6 AIR COMP ON #01-90	Unleaded					8.81	0	0	0.0013	0.00	0.00	21	0	0	0.0001	0.00	0.00	310	0	0	0	0	
1998	BGPL5 AIR COMP ON #99-66	Unleaded		1.5			8.81	13	0	0.0013	0.00	0.00	21	0	0	0.0001	0.00	0.00	310	0	0	13	0	
2003	UTILITY VACUUM TRLR	Unleaded	34	27.2	31	34.4	8.81	240	303	0.0013	0.04	0.04	21	1	1	0.0001	0.00	0.00	310	1	1	241	305	
2005	WELDER / GEN ON #01-89	Unleaded			10	10.1	8.81	0	89	0.0013	0.00	0.01	21	0	0	0.0001	0.00	0.00	310	0	0	0	90	
2005	WELDER / GEN ON #99-66	Unleaded	1	3.4		6.1	8.81	30	54	0.0013	0.00	0.01	21	0	0	0.0001	0.00	0.00	310	0	0	30	54	
2006	WT 500 GAL WATER TRLR	Unleaded		0.5			8.81	4	0	0.0013	0.00	0.00	21	0	0	0.0001	0.00	0.00	310	0	0	4	0	
2007	UTILITY VACUUM TRLR	Unleaded					8.81	0	0	0.0013	0.00	0.00	21	0	0	0.0001	0.00	0.00	310	0	0	0	0	
			Total Diesel	881.70		449.00	Total CO2 (kg)	9,997	5,355	Total CH4 (g)	0		GWP	0	0	Total N2O (g)	0		GWP	0	4	3	10,004	5,360
			Total Unleaded	118.90		90.50	Total CO2 (metrictons)	10.0	5.4					0.0	0.0					0.0	0.0	10	5	

Notes:
1. All factors from CCAR Protocol Version 3.0 April 2008 except electricity.

Water Services Inactive Vehicle Emission Calculations

Model Year	Vehicle	GVWR	Fuel Type	2006 Mileage	2006 Fuel (gal)	2007 Mileage / Hours	2007 Fuel (gal)	Date Inactive / Disposed (If Known)	CO2/Gal (Kg CO2 / Gal)	2006 CO2 / Year (Kg)	2007 CO2 / Year (Kg)	CH4/mile (g/mile)	2006 CH4 / Year (grams)	2007 CH4 / Year (grams)	CO2 Equivalent / Year (21:1)	2006 Kg CH4 GWP	2007 Kg CH4 GWP	N2O/mile (g/mile)	2006 N2O / Year (grams)	2007 N2O / Year (grams)	N2O Equivalent / Year (310:1)	2006 Kg N2O GWP	2007 Kg N2O GWP	Total 2006 CO2 GWP	Total 2007 CO2 GWP	
1997	K2500 4X4 XTR CAB SRW	More than	Diesel	9480	985.7	9200	924.9		10.15	10,005	9,388	0.06	569	552	21	12	12	0.05	474	460	310	147	143	10,164	9,542	
1992	RANGER 4X4 XTR CAB	Less than	Unleaded	5881	479.3	0	0	1/31/2007	8.81	4,223	0	0.09	529	0	21	11	0	0.11	647	0	310	201	0	4,434	0	
1996	S-10 2WD XTR CAB	Less than	Unleaded	7465	636.2			1/31/2007	8.81	5,605	0	0.06	448	0	21	9	0	0.06	448	0	310	139	0	5,753	0	
1996	S-10 4X4 XTR CAB	Less than	Unleaded	9211	635.95	0	0	10/24/2007	8.81	5,603	0	0.06	553	0	21	12	0	0.06	553	0	310	171	0	5,786	0	
1996	S-10 4X4 XTR CAB	Less than	Unleaded	9598	569.24	7145	452.9		8.81	5,006	3,990	0.06	575	429	21	12	9	0.06	575	429	310	178	133	5,197	4,132	
1996	S-10 2WD XTR CAB	Less than	Unleaded	9806	611.44	0	0	1/31/2007	8.81	5,387	0	0.06	588	0	21	12	0	0.06	588	0	310	182	0	5,882	0	
1998	RANGER 4X4 XTR CAB	Less than	Unleaded	16730	1126.9	15062	1061.7		8.81	9,928	9,354	0.06	1,004	904	21	21	19	0.06	1,004	904	310	311	280	10,260	9,653	
1992	K3500 4X4 STD CAB	More than	Unleaded	5313	646.6	3025	373.7	3/20/2008	8.81	5,697	3,292	0.12	638	363	21	13	8	0.2	1,063	605	310	329	188	6,039	3,487	
1992	K3500 4X4 STD CAB SWB	More than	Unleaded	13063	1555.1	3433	406	10/24/2007	8.81	13,700	3,577	0.12	1,568	412	21	33	9	0.2	2,613	687	310	810	213	14,543	3,798	
1993	K3500 4X4 STD CAB LWB	More than	Unleaded	2160	381.9	108	17.5	10/24/2007	8.81	3,365	154	0.12	259	13	21	5	0	0.2	432	22	310	134	7	3,504	161	
1995	F150 4X4 XTR CAB	More than	Unleaded	5004	459.9	3590	331.9		8.81	4,052	2,924	0.12	600	431	21	15	9	0.2	1,001	718	310	310	223	4,975	3,155	
1996	K1500 4X4 STD CAB	More than	Unleaded	27263	2303.2	13528	1185.1		8.81	20,291	10,441	0.12	3,272	1,623	21	69	34	0.2	5,453	2,706	310	1,690	839	22,050	11,314	
1996	K1500 4X4 STD CAB	More than	Unleaded	28084	2336.57	17709	1403.6		8.81	20,585	12,366	0.12	3,370	2,125	21	71	45	0.2	5,617	3,542	310	1,741	1,098	22,397	13,508	
2000	K1500 4X4 STD CAB	More than	Unleaded	26996	2117.1	17180	1439.2	3/20/2008	8.81	18,652	12,679	0.12	3,240	2,062	21	68	43	0.2	5,399	3,436	310	1,674	1,065	20,393	13,788	
1988	7000 2WD 5YD DMP		Diesel						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1989	7000 2WD 5YD DMP		Diesel					1/13/2006	0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1971	3400 TRACTOR WITH LOADER		Diesel					1/13/2006	0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1980	555 2WD BACKHOE/LOADER		Diesel						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1987	610C 2WD BACKHOE/LOADER		Diesel					1/13/2006	0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1989	JD MINI EXCAVATOR		Diesel						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1988	MODEL 25 MINI-EXCAVATOR		Diesel						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
2000	F-450 4X4 STD CAB SWB		Diesel						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1992	K1500 4X4 STD CAB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1992	K1500 4X4 STD CAB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1986	1/2 TON S-15 K/BED PICKUP		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1986	1/2 TON S-15 4X4 PICKUP		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1986	S-15 4X4 STD CAB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1986	1T 3500 4X4 DUALY W/SB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1986	1T 3500 4X4 DUALY W/SB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1992	1/2 TON 4X4 PICKUP		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1987	1/2 TON RANGER PICKUP		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1987	1/2 TON RANGER PICKUP		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1987	1/2 TON RANGER PICKUP		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1987	1/2 TON RANGER PICKUP		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1987	F700 TRUCK W/SERV BODY		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1990	1/2 TON K/CAB PICKUP		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1988	S-10 2WD STD CAB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1988	1/2 TON S-10 K/CAB PJU		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1988	S-10 2WD SDT CAB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1988	1/2T K/CAB W/SER BODY		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1988	CHERO 4X4 4DR SUV		Unleaded					1/13/2006	0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1995	F-150 4X4 XTR CAB		Unleaded					1/13/2006	0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1973	F600 FLATBED DUMP TRUCK		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1989	K1500 4X4 STD CAB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1989	K1500 4X4 STD CAB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1989	1 TON K30 4X4 DUALY W/SB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1989	1 TON K30 4X4 DUALY W/SB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1989	1/2 TON S-10 K/CAB 4X4		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1989	1/2 TON S-10 K/CAB 4X4		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1990	CAJRC 2WD 4DR SED		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1986	1/2 TON RANGER 4X4 PICKUP		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1990	1/2 TON K/CAB PICKUP		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1990	COROL 2WD 4DR SED		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1991	EXPLR 4X4 4DR SUV		Unleaded					1/13/2006	0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1992	RANGR 4X4 XTR CAB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1992	K1500 4X4 STD CAB		Unleaded					1/13/2006	0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1992	ARSTR 4X4 MINI VAN		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1995	F-150 4X4 XTR CAB		Unleaded					1/13/2006	0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1992	1T 3500 4X4 DUALY W/SB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1992	1T 3500 DUALY W/SB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1992	C3500 2WD STD CAB SWB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1992	K3500 2WD STD CAB LWB		Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1992	K3500 4X4 STD CAB LWB		Unleaded					1/13/2006	0	0	0	0	0	0	21	0	0	0	0	0	0	310	0	0	0	0
1971	34 2TON 2560 4X4 W/S																									

Appendix E
Greenhouse Gas Emission Calculations

Water Services Inactive Portable Equipment Emissions Calculations

Model Year	Vehicle	Fuel Type	2006 Hours	2006 Fuel (gal)	2007 Mileage / Hours	2007 Fuel (gal)	Date Inactive / Disposed (If Known)	CO2/Gal (Kg CO2 / Gal)	2006 CO2 / Year (Kg)	2007 CO2 / Year (Kg)	CH4/mile (g/mile)	2006 CH4 / Year (grams)	2007 CH4 / Year (grams)	CO2 Equivalent / Year (21:1)	2006 CH4 GWP	2007 CH4 GWP	N2O/mile (g/mile)	2006 N2O / Year (grams)	2007 N2O / Year (grams)	N2O Equivalent / Year (310:1)	2006 N2O GWP	2007 N2O GWP	Total 2006 CO2 GWP	Total 2007 CO2 GWP
1993	P-185WJD AIR COMP ON TRLR	Diesel	10	18			10/24/2007	10.15	183	0	0	0	0	21	0	0	0	0	0	310	0	0	183	0
2001	P175WJDU AIR/COMP #01-84	Diesel	23	37.9				10.15	385	0	0	0	0	21	0	0	0	0	0	310	0	0	385	0
1997	MODEL 331 MINI-EXCAVATOR	Diesel	3	3.4			8/12/2006	10.15	35	0	0	0	0	21	0	0	0	0	0	310	0	0	35	0
1992	4100 4x4 BACKHOE/LOADER	Diesel	47	72.5	165	94.6		10.15	736	960	0	0	0	21	0	0	0	0	0	310	0	0	736	960
2000	CHAIN SAWS	**	99					0	0	0	0	0	0	21	0	0	0	0	0	310	0	0	0	0
1980	INGERSOL RAND COMPRESSOR	Diesel						0	0	0	0	0	0	21	0	0	0	0	0	310	0	0	0	0
1986	INGERSOL RAND COMPRESSOR	Diesel						0	0	0	0	0	0	21	0	0	0	0	0	310	0	0	0	0
1980	STA MT COMP ON VEH 87-18	Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	310	0	0	0	0
1975	SA200F-163 WELDER ON TRLR	Unleaded					1/31/2007	0	0	0	0	0	0	21	0	0	0	0	0	310	0	0	0	0
1944	WATER PUMP ON JEEP TRLR	Unleaded						0	0	0	0	0	0	21	0	0	0	0	0	310	0	0	0	0
9992	WELDER-GEN ON #01-89	Unleaded					8/12/2006	0	0	0	0	0	0	21	0	0	0	0	0	310	0	0	0	0
1994	WELDER-GEN ON #99-66	Unleaded					8/12/2006	0	0	0	0	0	0	21	0	0	0	0	0	310	0	0	0	0
Total Diesel				131.80		94.60		Total CO2 (kg)	1,338	960	Total CH4 (g)	0	0	GWP equiv	0	0	Total N2O (g)	0	0	0	0	0	1,338	960
Total Unleaded				0.00		0.00		Total CO2 (metrictons)	1.3	1.0					0.0	0.0					0.0	0.0	1.3	1.0

- Notes:
1. Vehicles are classified as heavy duty trucks according to their GVWR. Emission factors were used accordingly
2. All factors from CCAR Protocol Version 3.0 April 2008 except electricity.

Appendix E
Greenhouse Gas Emission Calculations

Water Services Fuel Can Emissions Calculations

Fuel Type	Fuel Can Gallons Distributed 2006	Fuel Can Gallons Distributed 2007	CO2/Gal (Kg CO2 / Gal)	2006 CO2 / Year (Kg)	2007 CO2 / Year (Kg)	CH4/gallon (kg/gal)	2006 CH4 / Year (kg)	2007 CH4 / Year (kg)	CO2 Equivalent / Year (21:1)	2006 CH4 GWP (Kg)	2007 CH4 GWP (Kg)	N2O/gallon (kg/gal)	2006 N2O / Year (kg)	2007 N2O / Year (kg)	N2O Equivalent / Year (310:1)	2006 N2O GWP (Kg)	2007 N2O GWP (Kg)	Total 2006 CO2 GWP	Total 2007 CO2 GWP
Diesel 2	2144.5	2251.31	10.15	21,767	22,851		0	0	21	0	0		0	0	310	0	0	21,767	22,851
Unleaded	659.9	577.06	8.81	5,814	5,084	0.0013	1	1	21	18	16	0.0001	0	0	310	20	18	5,852	5,118
			Total CO2 (kg)	27,580	27,935	Total CH4 (g)	1	1	GWP equiv	18	16	Total N2O (g)	0	0	GWP equiv	20	18	27,619	27,968
			Total CO2 (metric tons)	27.6	27.9					0.0	0.0					0.0	0.0	28	28

Notes:

1. All factors from CCAR Protocol Version 3.0 April 2008 except electricity.

Appendix E
Greenhouse Gas Emission Calculations

Water Services Small Engines Emissions Calculations

Type of Equipment	Division	Number	Make	Engine Make	Engine Model	Engine Year	Engine Displacement	Units	Engine HP	Fuel Type	Trank Size	Units	Hour operated in 2007	Hours per Month	Run time on a tank of fuel	Units	Gal/hr (from manufacturer specs)	Gallons Consumed in 2007	CO2/Gal (Kg CO2 / Gal)	2006 CO2 / Year (Kg)	2007 CO2 / Year (Kg)
Power Carrier	RW	1	Honda	Honda	GXV120		118 cc		4	UL			20	2					8.81		0
Power Carrier	RW	1	Honda	Honda	GX270		242 cc		8	UL			20	2					8.81		0
Power Carrier	RW	1	Honda	Honda	GX270		242 cc		8	UL			20	2					8.81		0
Generator	RW	2	Honda	Honda	EM3500S		242 cc			UL	4.49 Gal		120	10	12 HR		0.374167	44.9	8.81		396
Generator	RW	2	Honda	Honda	EB3800X		242 cc		8	UL	6.6 Gal		120	10	12 HR		0.55	66	8.81		581
Generator	RW	2	Honda	Honda	EB3800X		242 cc		8	UL	6.6 Gal		120	10	12 HR		0.55	66	8.81		581
Generator	RW	2	Honda	Honda	EB3800X		242 cc		8	UL	6.6 Gal		120	10	12 HR		0.55	66	8.81		581
Generator	RW	2	Honda	Honda	EB3800X		242 cc		8	UL	6.6 Gal		120	10	12 HR		0.55	66	8.81		581
Generator	RW	2	Honda	Honda	EM3500S		242 cc			UL	4.49 Gal		120	10	12 HR		0.374167	44.9	8.81		396
Generator	RW	2	Honda	Honda	EM3500S		242 cc			UL	4.49 Gal		120	10	12 HR		0.374167	44.9	8.81		396
Generator	RW	2	Honda	Honda	EM3500S		242 cc			UL	4.49 Gal		120	10	12 HR		0.374167	44.9	8.81		396
Generator	RW	2	Honda	Honda	EM3500S		242 cc			UL	4.49 Gal		120	10	12 HR		0.374167	44.9	8.81		396
Generator	TW	2	Honda	Honda	EG3500	1995	242 CC		8	UL	12.7 Gal		0	0					8.81		0
Generator	WB	2	Honda	Honda	GX160K1		163 cc		5.5	UL	0.98 Gal		0	0	3 HR		0.326667	0	8.81		0
Generator	WQ	2	Honda	Honda	EM50005	2005	14.8 IN		10	UL	6.6 Gal		60	5	4 HR		1.65	99	8.81		872
Chain Saw	CO	3	Stihl	Stihl	026		48.7 cc			ULLOIL	0.97 PT		2						8.81		0
Chain Saw	CO	3	Stihl	Stihl	011AYT		41 cc			ULLOIL	0.53 PT		2						8.81		0
Chain Saw	CO	3	Stihl	Stihl	026		48.7 cc			ULLOIL	0.97 PT		2						8.81		0
Chain Saw	CO	3	Stihl	Stihl		311	59 cc		4	ULLOIL	18.9 oz		2						8.81		0
Chain Saw	CO	3	Stihl	Stihl	026		48.7 cc			ULLOIL	0.97 PT		2						8.81		0
Chain Saw	CO	3	Stihl	Stihl	MS270C		50 cc		3.4	ULLOIL			8	1.5	40 min		0	0	8.81		0
Chain Saw	CO	3	Stihl	Stihl	MS250		45.4 cc		3	ULLOIL	15.9 oz		8	1.5	40 min		0.186328	1.490625	8.81		13
Chain Saw	CO	3	Echo	Echo	CS-370	2007	36.3 cc			ULLOIL	13.9 oz		2	0.5	3 hrs		0.036198	0.07239583	8.81		1
Chain Saw	CO	3	Stihl	Stihl	026		48.7 cc			ULLOIL	0.97 PT		2						8.81		0
Chain Saw	RW	3	Stihl	Stihl	MS260		50.2 cc		3.2	ULLOIL	15.6 OZ		100	10	1 HR		0.121875	12.1875	8.81		107
Chain Saw	RW	3	Stihl	Stihl	026		48.7 cc			ULLOIL	0.97 PT		80	6	1 HR		0.12125	9.7	8.81		85
Chain Saw	RW	3	Husqvarna		141	1998	40 cc			ULLOIL			100	10	1 HR		0	0	8.81		0
Chain Saw	RW	3	Stihl	Stihl	MS260		50.2 cc		3.2	ULLOIL	15.6 OZ		80	6	1 HR		0.121875	9.75	8.81		86
Chain Saw	RW	3	Stihl	Stihl	MS250		45.4 cc		3	ULLOIL	15.9 OZ		80	10	1 HR		0.124219	9.9375	8.81		88
Chain Saw	RW	3	Stihl	Stihl	066		91.6 cc			ULLOIL	1.74 PT		120	30	1 HR		0.2175	26.1	8.81		230
Chain Saw	RW	3	Stihl	Stihl	MS170		30.1 c		1.7	ULLOIL	8.5 OZ		80	6	1 HR		0.066406	5.3125	8.81		47
Chain Saw	RW	3	Stihl	Stihl	026		48.7 cc			ULLOIL	0.97 PT		80	6	1 HR		0.12125	9.7	8.81		85
Chain Saw	RW	3	Stihl	Stihl	MS270C		50 cc		3.4	ULLOIL	17.6 OZ		80	6	1 HR		0.1375	11	8.81		97
Chain Saw	RW	3	Stihl	Stihl	MS270C		50 cc		3.4	ULLOIL	17.6 OZ		80	6	1 HR		0.1375	11	8.81		97
Chain Saw	RW	3	Stihl	Stihl	MS250		2.77 cc		3	ULLOIL	15.9 OZ		80	6	1 HR		0.124219	9.9375	8.81		88
Chain Saw	RW	3	Stihl	Stihl	MS250		2.77 cc		3	ULLOIL	15.9 OZ		80	6	1 HR		0.124219	9.9375	8.81		88
Chain Saw	RW	3	Stihl	Stihl	MS250		2.77 cc		3	ULLOIL	15.9 OZ		80	6	1 HR		0.124219	9.9375	8.81		88
Chain Saw	WB	3	Echo	Echo	CS306		30.1 cc			ULLOIL	9.3 OZ		6	0.5	30 Min		0.145313	0.871875	8.81		8
Chain Saw	WB	3	Stihl	Stihl	026		48.7 cc			ULLOIL	0.97 PT		12	1	1 HR		0.12125	1.455	8.81		13
Chain Saw	WB	3	Echo	Echo	CS3000		30.1 cc			ULLOIL	8.6 OZ		8	0.5	0.5 HR		0.134375	1.075	8.81		9
Chain Saw	WB	3	Stihl	Stihl		250	54.7 cc			ULLOIL			8	0.5	0.5 HR		0	0	8.81		0
Chain Saw	WB	3	Echo	Echo	CS3450		33.4 cc			ULLOIL	8.6 OZ		6	0.5	40 Min		0.100781	0.6046875	8.81		5
Chain Saw	WB	3	Stihl	Stihl	MS260		50.2 cc		3.2	ULLOIL	15.6 OZ		12	1	40 min		0.182813	2.19375	8.81		19
Cut Off Saw	RW	4	Husqvarna		375K		4.3 IN		5	ULLOIL	1.63 PT		100	10	1 HR		0.20375	20.375	8.81		180
Cut Off Saw	RW	4	Husqvarna	Husqvarna	375K		4.3 IN		5	ULLOIL	1.63 PT		80	6	1 HR		0.20375	16.3	8.81		144
Cut Off Saw	RW	4	Husqvarna	Husqvarna	375K		4.3 IN		5	ULLOIL	1.63 PT		80	6	1 HR		0.20375	16.3	8.81		144
Cut Off Saw	TW	4	Husqvarna		375K	2002	4.3 IN		5	ULLOIL	1.63 PT		6	0.5	0.5 HR		0.4075	2.445	8.81		22
Cut Off Saw	TW	4	Stihl		TS400		3.91 IN		4.4	ULLOIL	22 OZ		0	0	1 HR		0.171875	0	8.81		0
Cut Off Saw	TW	4	Husqvarna		375K	2002	4.3 IN		5	ULLOIL	1.63 PT		75	12	1 HR		0.20375	15.28125	8.81		135
Cut Off Saw	TW	4	Stihl		TS400		3.91 IN		4.4	ULLOIL	22 OZ		7	1	1 HR		0.171875	1.203125	8.81		11
Cut Off Saw	TW	4	Stihl		TS760		111 CC		6.5	ULLOIL	40.5 OZ		10	0.5	1 HR		0.316406	3.1640625	8.81		28
Cut Off Saw	WQ	4	Stihl	Stihl	TS360	2005	3.68 IN		2	ULLOIL	1.2 PT		18	1.5	1 HR		0.15	2.7	8.81		24
Walk Behind Concrete Saw	TW	5	Core Cut	Honda	GX620		614 CC		20	UL			40	0.5	4 HR		0	0	8.81		0
Diesel Heater	RW	6	Dayton		3YE51		170000 BTU			Diesel			100	20	16 HR		0	0	10.15		0
Line Bore Tool	TW	7	Briggs & Stratton		422447				18	UL			0	0	4 HR		0	0	8.81		0
Jumping Jack - Wacker	TW	9	Wacker		BS600	2003			2.9	UL	1.5 Gal		20	1.2	6 HR		0.25	5	8.81		44
Jumping Jack - Wacker	TW	9	Wacker		BS600	2000			2.9	UL	1.5 Gal		30	3	5 HR		0.3	9	8.81		79
Jumping Jack - Wacker	RW	9	Wacker		BS600				2.9	ULLOIL	1.5 Gal		100	12	6 HR		0.25	25	8.81		220
Jumping Jack - Wacker	RW	9	Wacker		BS 60-2i				2.9	ULLOIL	1.5 Gal		0	10	5 HR		0.3	0	8.81		0
Jumping Jack - Wacker	TW	9	Wacker		BS 60-2i	2007	4.9 IN		3.1	ULLOIL	3.2 QT		0	12	6 HR		0.133333	0	8.81		0
Jumping Jack - Wacker	TW	9	Wacker		BS 60-2i	2005			2.9	ULLOIL	1.5 Gal		100	20	5 HR		0.3	30	8.81		264
Jumping Jack - Wacker	TW	9	Wacker		BS 60-2i	2005			2.9	ULLOIL	1.5 Gal		100	10	5 HR		0.3	30	8.81		264
Jumping Jack - Wacker	WQ	9	Wacker		BS 60-2i	2006	4.9 IN		3.1	ULLOIL	3.2 QT		60	5	1 HR		0.8	48	8.81		423
Jumping Jack - Wacker	RW	9	Wacker	PD 3						ULLOIL			120	30	6 HR		0	0	8.81		0

Appendix E
Greenhouse Gas Emission Calculations

Water Services Small Engines Emissions Calculations

Type of Equipment	Division	Number	Make	Engine Make	Engine Model	Engine Year	Engine Displacement	Units	Engine HP	Fuel Type	Trank Size	Units	Hour operated in 2007	Hours per Month	Run time on a tank of fuel	Units	Gal/hr (from manufacturer specs)	Gallons Consumed in 2007	CO2/Gal (Kg CO2 / Gal)	2006 CO2 / Year (Kg)	2007 CO2 / Year (Kg)	
Jumping Jack - Wacker	TW	9	Wacker		BS600	2002			2.9	UL/OIL	1.5 Gal		200	16	5 HR		0.3	60	8.81		529	
Trash Pump	TW	10	Wacker	Honda	GX120	2003			4	UL	2.6 QT		200	16	5 HR		0.13	26	8.81		229	
Trash Pump	TW	10	Wacker	Honda	PDT3A	1996			4	UL			10	0.75	5 HR		0	0	8.81		0	
Trash Pump	TW	10	Honda	Honda	GX120	2005			4	UL	2.6 QT		0	0	5 HR		0.13	0	8.81		0	
Trash Pump	TW	10	Wacker	Honda	GX120	2005			4	UL	2.6 QT		40	3.6	5 HR		0.13	5.2	8.81		46	
Trash Pump	TW	10	Wacker	Honda	GX120	2006			4	UL	2.6 QT		4	0.1	5 HR		0.13	0.52	8.81		5	
Trash Pump	TW	10	Wacker	Honda	GX120	2003			4	UL	2.6 QT		60	6	3 HR		0.216667	13	8.81		115	
Trash Pump	TW	10	Honda	Honda	GX120	2003			4	UL	2.6 QT		10	2	4 HR		0.1625	1.625	8.81		14	
Pressure Washer	WQ	11		Honda		2006			13	UL	5 Gal		20	1.5	20 HR		0.25	5	8.81		44	
Pressure Washer	WQ	11		Honda	GX340	2004	377 CC		11	UL	2 Gal		24	2	4 HR		0.5	12	8.81		106	
Wead Eater	WB	12	Stihl	Stihl	FS450		44.3 cc		2.82	UL/OIL	22.7 OZ		12	1	40 Min		0.266016	3.1921875	8.81		28	
Wead Eater	WB	12	Stihl	Stihl	FS450		44.3 cc		2.82	UL/OIL	22.7 OZ		10	0.75	0.5 HR		0.354688	3.546875	8.81		31	
Wead Eater	WB	12	Stihl	Stihl	FS450		44.3 cc		2.82	UL/OIL	22.7 OZ		10	0.75	30 Min		0.354688	3.546875	8.81		31	
Wead Eater	WQ	12	Stihl	Stihl	FS84	2001	1.55 IN		1.27	UL/OIL	15.2 OZ		24	2	1 HR		0.11875	2.85	8.81		25	
Wead Eater	WQ	12	Stihl	Stihl	FS84	2001	1.55 IN		1.27	UL/OIL	15.2 OZ		24	2	1 HR		0.11875	2.85	8.81		25	
Wead Eater	WQ	12	Husqvarna	Husqvarna	345R	2006	45 CC			UL/OIL	1 QT		24	2	1 HR		0.25	6	8.81		53	
Hedge Trimmer	CO	13	Stihl	Stihl	HS81R		22.7 cc		0.94	UL/OIL	12.5 oz		10	2	30 min		0.195313	1.953125	8.81		17	
Hedge Trimmer	WB	13	Stihl	Stihl	HS180		31.8 cc			UL/OIL			6	0.5	0.5 HR		0	0	8.81		0	
Water Pump	RW	14	Honda	WT30X	GX240K1		242 cc		8	UL	1.4 Gal		140	20	5 HR		0.28	39.2	8.81		345	
Water Pump	RW	14	Honda		GX160		163 cc		5.5	UL									8.81		0	
Water Pump	RW	14	Honda		GX160		163 cc		5.5	UL									8.81		0	
Water Pump	RW	14	Honda		GX160		163 cc		5.5	UL									8.81		0	
Water Pump	RW	14	Honda		GX160		163 cc		5.5	UL									8.81		0	
Water Pump	RW	14	Honda	WB20X	GX120T1		118 cc		3.89	UL			200	40	4 HR		0	0	8.81		0	
Water Pump	RW	14	Honda	WB20X	GX120T1		118 cc		3.89	UL			200	40	4 HR		0	0	8.81		0	
Water Pump	RW	14	Honda	WB20X	GX120T1		118 cc		3.89	UL			200	40	4 HR		0	0	8.81		0	
Water Pump	RW	14	Honda	WB20X	GX120T1		118 cc		3.89	UL			200	40	4 HR		0	0	8.81		0	
Water Pump	RW	14	Honda	WB30X	GX240K1		242 cc		8	UL	1.4 Gal		160	30	4 HR		0.35	56	8.81		493	
Water Pump	RW	14	Honda	WB30X	GX240K1		242 cc		8	UL	1.4 Gal		160	30	4 HR		0.35	56	8.81		493	
Water Pump	RW	14	Honda	WB30X	GX240K1		242 cc		8	UL	1.4 Gal		160	30	4 HR		0.35	56	8.81		493	
Water Pump	RW	14	Honda	WB30X	GX240K1		242 cc		8	UL	1.4 Gal		160	30	4 HR		0.35	56	8.81		493	
Water Pump	RW	14	Honda	WB30X	GX240K1		242 cc		8	UL	1.4 Gal		160	30	4 HR		0.35	56	8.81		493	
Water Pump	WB	14	Honda	Honda	GX25		25 cc		1.1	UL			3	0.25	1 HR		0	0	8.81		0	
Water Pump	WQ	14	Shindawa		545P	2006			0.5	UL	1 QT		5	0.5	1 HR		0.25	1.25	8.81		11	
Water Pump	WQ	14		Briggs & Stratton		1987			3	UL	0.5 Gal		10	0.75	4 HR		0.125	1.25	8.81		11	
Pole Saw	WB	15	Stihl	Stihl	HT73		36.3 cc		1.9	UL/OIL	18 OZ		12	1	40 Min		0.210938	2.53125	8.81		22	
Pole Saw	WQ	15	Stihl	Stihl	HT101	2006	1.92 IN		1.36	UL/OIL	18 OZ		20	1.5	1 HR		0.140625	2.8125	8.81		25	
Steam Cleaner/pressure wash	FM		980 SS Hotsey			2006				Diesel/Electr	11 Gal		12.79	1.06	4.5 HR		2.444444	31.2644444	10.15		317	
Lawn Mower	WB			Briggs & Stratton					6.5	UL			4	0.33	1 HR		0	0	8.81		0	
Air Compressor	WB			Honda	GX160		163 cc		5.5	UL			16	1.3	1.5 HR		0	0	8.81		0	
Lawn Mower	WB		Yard Mach	Tecumseh	LEV 120		195 cc		5	UL			0	0	1 HR		0	0	8.81		0	
Lawn Mower	WB		Roof Mower	Kawasaki	FC290V		17.5 in		9	UL			4	0.25	1 HR		0	0	8.81		0	
Air Compressor	FM		Honda	Honda		2000			11	UL									8.81		0	
Pole Saw	CO		Stihl	Stihl	H175		31.8 cc		2	UL/OIL			8	1.5	40 min		0	0	8.81		0	
Chain Saw	TV		Husqvarna		375K	2002	4.3 IN			UL/OIL	1.63 PT		200	16	1 HR		0.20375	40.75	8.81		359	
Chain Saw / Hedge Trimmer	WB		Stihl	Stihl	026		48.7 cc			UL/OIL	0.97 PT		3	0.25	30 Min		0.2425	0.7275	8.81		6	
Power Blower	WB		Echo	Echo	PB4600		44 cc			UL/OIL	1.9 liter		3	0.25	40 Min		0.753968	2.26190476	8.81		20	
Pull Behind Mower	WB			Briggs & Stratton					10.5	UL/OIL			20	1.75	2 HR		0	0	8.81		0	
Leaf Blower	WQ		Stihl	Stihl	BR420	2004	56.5 CC			UL/OIL	50 OZ		24	2	1.5 HR		0.260417	6.25	8.81		55	
																				Total CO2 (kg)		13,346
																				Total CO2 (metrictons)		13.3

Notes:
Conversion factors
1 gal= 3.78 L = 128 oz = 8 pint = 4 qt

Power Services On Road Vehicle Emissions Calculations

On Road Vehicle	GVWR	2006 Mileage	2006 Fuel (gal)	2007 Mileage	2007 Fuel (gal)	Fuel Type	CO2/Gal (Kg CO2 / Gal)	2006 CO2 / Year (Kg)	2007 CO2 / Year (Kg)	CH4/mile (g/mile)	2006 CH4 / Year (grams)	2007 CH4 / Year (grams)	CO2 Equivalent / Year (21:1)	2006 CH4 GWP (Kg)	2007 CH4 GWP (Kg)	N2O/mile (g/mile)	2006 N2O / Year (grams)	2007 N2O / Year (grams)	N2O Equivalent / Year (310:1)	2006 N2O GWP (Kg)	2007 N2O GWP (Kg)	Total 2006 CO2 GWP	Total 2006 CO2 GWP
#92-11 - International 4x4 Dump Truck	More than 5750	3,161	898	3,034	691	Diesel	10.15	9,115	7,014	0.08	253	243	21	5	5	0.05	158	152	310	49	47	9,167	7,066
#94-16 - Ford Crane Truck w/ Basket	More than 5750	170	58	1,392	273	Diesel	10.15	589	2,771	0.08	14	111	21	0	2	0.05	9	70	310	3	22	611	2,795
#95-17 - GMC 4x4 1 Ton Truck w/ Service Body	More than 5750	1,272	86	1,554	109	Diesel	10.15	873	1,106	0.08	102	124	21	2	3	0.05	64	78	310	20	24	899	1,133
#96-07 - Ford Bucket Truck	More than 5750	297	62	989	62	Diesel	10.15	629	629	0.06	18	59	21	0	1	0.05	15	49	310	5	15	645	646
#97-12 - Chevy 4x4 1 Ton Truck w/ Service Body	More than 5750	5,356	620	9,624	1,096	Diesel	10.15	6,293	11,124	0.06	321	577	21	7	12	0.05	268	481	310	83	149	6,449	11,256
#97-22 - Chevy 4x4 3/4 Ton Truck w/ Camper Shell	More than 5750	1,787	152	1,643	119	Diesel	10.15	1,543	1,208	0.06	107	99	21	2	2	0.05	89	82	310	28	25	1,571	1,235
#98-04 - Chevy 4x4 3/4 Ton Truck w/ Service Body	More than 5750	7,626	975	9,272	981	Diesel	10.15	9,896	9,957	0.06	458	556	21	10	12	0.05	381	464	310	118	144	10,050	10,113
#00-06 - Ford 4x4 1 Ton Truck	More than 5750	7,706	636	7,973	628	Diesel	10.15	6,455	6,374	0.06	462	478	21	10	10	0.05	385	399	310	119	124	6,589	6,508
#00-09 - Ford 4x4 1 Ton Truck	More than 5750	7,093	769	9,239	634	Diesel	10.15	7,805	6,435	0.06	426	554	21	9	12	0.05	355	462	310	110	143	7,957	6,590
#01-17 - Ford 4x4 F450 Truck	More than 5750	7,632	891	10,894	1,336	Diesel	10.15	9,044	13,560	0.06	458	654	21	10	14	0.05	382	545	310	118	169	9,222	13,743
#02-22 - Ford 4x4 1 Ton Truck	More than 5750	14,261	1,319	12,439	1,138	Diesel	10.15	13,388	11,951	0.06	896	746	21	18	16	0.05	713	622	310	221	193	13,999	11,759
#05-01 - Ford 4x4 1 Ton F350 Truck	More than 5750	12,435	1,145	14,426	1,300	Diesel	10.15	11,622	13,195	0.06	746	866	21	16	18	0.05	622	721	310	193	224	11,981	13,437
#06-08 - Ford 4x4 F450 Truck	More than 5750	7,075	694	8,165	852	Diesel	10.15	7,044	8,648	0.06	425	490	21	9	10	0.05	354	408	310	110	127	7,180	8,785
#01-03 - Ford 4x4 Ranger Pick-Up	Less than 5750	1,995	209	2,458	133	Gas	8.81	1,841	1,172	0.05	100	123	21	2	3	0.06	120	147	310	37	46	1,889	1,220
#01-02 - Ford 4x4 Ranger Pick-Up	Less than 5750	8,688	432	2,830	211	Gas	8.81	3,806	1,859	0.05	434	192	21	9	4	0.06	521	230	310	162	71	3,896	1,934
#96-20 - Ford 4x4 Ranger Pick-Up	Less than 5750	7,103	327	1,696	100	Gas	8.81	2,881	881	0.06	426	102	21	9	2	0.06	426	102	310	132	32	2,921	915
#99-10 - Ford 4x4 Ranger Pick-Up	Less than 5750	6,291	458	-	-	Gas	8.81	4,035	0	0.06	377	0	21	8	0	0.06	377	0	310	117	0	4,043	0
#03-14 - Ford 4x4 3/4 Ton Truck	More than 5750	7,897	1,147	12,388	1,286	Gas	8.81	10,105	11,330	0.12	948	1,487	21	20	31	0.2	1,579	2,476	310	490	788	10,993	12,128
#05-02 - Ford 4x4 Expedition	More than 5750	8,006	745	14,618	1,198	Gas	8.81	6,563	10,554	0.12	961	1,754	21	20	37	0.2	1,601	2,924	310	496	906	7,490	11,458
#07-10 - Chevy 4x4 Silverado Truck	More than 5750	4,565	312	13,235	887	Gas	8.81	2,749	7,814	0.12	548	1,588	21	12	33	0.2	913	2,647	310	283	821	3,581	8,668
#07-13 - Chevy 4x4 Silverado Truck	More than 5750	741	60	10,966	573	Gas	8.81	529	5,048	0.12	89	1,316	21	2	28	0.2	148	2,193	310	46	680	1,210	5,756
#07-14 - Chevy 4x4 Silverado Truck	More than 5750	0	0	8,779	806	Gas	8.81	0	7,101	0.12	0	1,053	21	0	22	0.2	0	1,756	310	0	544	544	7,667
#07-15 - Chevy 4x4 Trailblazer	More than 5750	255	18	5,418	300	Gas	8.81	159	2,643	0.12	31	650	21	1	14	0.2	51	1,084	310	16	336	455	2,993
#08-01 - Ford 4x4 F250 Truck	More than 5750	0	0	553	62	Gas	8.81	0	546	0.12	0	66	21	0	1	0.2	0	111	310	0	34	34	552
#95-18 - GMC 4x4 Utility Truck	More than 5750	3,439	209	2,294	96	Gas	8.81	1,841	846	0.12	413	275	21	9	6	0.2	688	459	310	213	142	1,992	994
#97-23 - Ford 4x4 Expedition	More than 5750	4,571	334	6,291	472	Gas	8.81	2,943	4,158	0.12	549	755	21	12	16	0.2	914	1,258	310	283	390	3,344	4,564
#98-05 - Chevy 4x4 3/4 Ton Pick-Up	More than 5750	4,249	569	13,455	1,276	Gas	8.81	5,013	11,242	0.12	510	1,615	21	11	34	0.2	850	2,691	310	263	834	5,858	12,110
Total:		133,671	13,125	186,625	16,619		Total CO2 (kg)	126,760	158,767	Total CH4 (g)	10,029	16,534	GWP equiv	211	347	Total N2O (g)	11,983	22,611	GWP equiv	3,715	7,009	133,980	166,123
							Total CO2 (metrictons)	126.8	158.8					0.2	0.3					3.7	7.0	134	166

Notes:
 1. Vehicles are classified as heavy duty trucks according to their GVWR. Emission factors were used accordingly
 2. All factors from CCAR Protocol Version 3.0 April 2008 except electricity.

Power Services Off Road Vehicle 2006 Emissions Calculations

Off Highway Vehicle	Mileage	2006 Fuel (gal)	Fuel Type	CO2/Gal (Kg CO2 / Gal)	2006 CO2 / Year (Kg)	CH4/gallon (kg/gal)	2006 CH4 / Year (kg)	CO2 Equivalent / Year (21:1)	2006 CH4 GWP (Kg)	N2O/gallon (kg/gal)	2006 N2O / Year (kg)	N2O Equivalent / Year (310:1)	2006 N2O GWP (Kg)	Total 2006 CO2 GWP
55C Clark/Michigan Loader	N/A	220	Diesel	10.15	2,233	need factor		21	0	need factor		310	0	2,233
1999 John Deere Backhoe Loader 410E	N/A	382	Diesel	10.15	3,877	need factor		21	0	need factor		310	0	3,877
2000 John Deere Grader w/ Runners	N/A	177	Diesel	10.15	1,797	need factor		21	0	need factor		310	0	1,797
2004 Tucker Snowcat (Terra)	N/A	81	Diesel	10.15	822	need factor		21	0	need factor		310	0	822
Boat, Holiday Starcraft & Boat Motor 50 HP Moray	N/A	0	Gas	8.81	0	0.0013	0	21	0	0.0001	0	310	0	0
Boat, Valco 14' Pram Model P-14	N/A	6	Gas	8.81	53	0.0013	0.0078	21	0	0.0001	0.0006	310	0	53
Snow Cat Model 1300 Eng. #E552700 Tucker	N/A	126	Gas	8.81	1,110	0.0013	0.1638	21	3	0.0001	0.0126	310	4	1,117
Snow Cat Model 1500 LMC	N/A	29	Gas	8.81	255	0.0013	0.0377	21	1	0.0001	0.0029	310	1	257
ATV-2 CA 1993 Honda	N/A	2	Gas	8.81	18	0.0013	0.0026	21	0	0.0001	0.0002	310	0	18
ATV-1 CA 1993 Honda	N/A	0	Gas	8.81	0	0.0013	0	21	0	0.0001	0	310	0	0
Total CO2 (kg)					10,168	Total CH4 (g)		0.2 GWP equiv	4.4	Total N2O (g)		0 GWP equiv		5
Total CO2 (metrictons)					10.2				0.0					10

Power Services Off Road Vehicle 2007 Emissions Calculations

Off Highway Vehicle	Mileage	2007 Fuel (gal)	Fuel Type	CO2/Gal (Kg CO2 / Gal)	2007 CO2 / Year (Kg)	CH4/gallon (kg/gal)	2007 CH4 / Year (kg)	CO2 Equivalent / Year (21:1)	2007 CH4 GWP (Kg)	N2O/gallon (kg/gal)	2007 N2O / Year (kg)	N2O Equivalent / Year (310:1)	2007 N2O GWP (Kg)	Total 2007 CO2 GWP
55C Clark/Michigan Loader	N/A	0	Diesel	10.15	0	need factor		21	0	need factor		310	0	0
1999 John Deere Backhoe Loader 410E	N/A	147	Diesel	10.15	1,492	need factor		21	0	need factor		310	0	1,492
2000 John Deere Grader w/ Runners	N/A	303	Diesel	10.15	3,075	need factor		21	0	need factor		310	0	3,075
2004 Tucker Snowcat (Terra)	N/A	326	Diesel	10.15	3,309	need factor		21	0	need factor		310	0	3,309
Boat, Holiday Starcraft & Boat Motor 50 HP Moray	N/A	6	Gas	8.81	53	0.0013	0.0078	21	0	0.0001	0.0006	310	0	53
Boat, Valco 14' Pram Model P-14	N/A	19	Gas	8.81	167	0.0013	0.0247	21	1	0.0001	0.0019	310	1	168
Snow Cat Model 1300 Eng. #E552700 Tucker	N/A	354	Gas	8.81	3,119	0.0013	0.4602	21	10	0.0001	0.0354	310	11	3,139
Snow Cat Model 1500 LMC	N/A	51	Gas	8.81	449	0.0013	0.0663	21	1	0.0001	0.0051	310	2	452
ATV-2 CA 1993 Honda	N/A	4	Gas	8.81	35	0.0013	0.0052	21	0	0.0001	0.0004	310	0	35
ATV-1 CA 1993 Honda	N/A	4	Gas	8.81	35	0.0013	0.0052	21	0	0.0001	0.0004	310	0	35
Total CO2 (kg)					11,735	Total CH4 (kg)		1 GWP equiv	12	Total N2O (kg)		0 GWP equiv		14
Total CO2 (metrictons)					11.7				0.0					12

Notes:
1. Vehicles are classified as heavy duty trucks according to their GVWR. Emission factors were used accordingly
2. All factors from CCAR Protocol Version 3.0 April 2008 except electricity.

Power Services 2006 Generator and Miscellaneous Emissions Calculations

Engine Type	Location	HP/RPM	Engine Size	Fuel Type	Fuel (gal)	2006 CO ₂ /Gal (Kg CO ₂ / Gal)	2006 CO ₂ / Year (Kg)	CH ₄ /mile (g/mile)	2006 CH ₄ / Year (grams)	CO ₂ Equivalent / Year (21:1)	2006 CH ₄ GWP (Kg)	N ₂ O/mile (g/mile)	2006 N ₂ O / Year (grams)	N ₂ O Equivalent / Year (310:1)	2006 N ₂ O GWP (Kg)	Total 2006 CO ₂ GWP
Engine Generator	Wakesha - FMPH	900rpm	2894ci - 6cyl	Diesel	0	10.15	0		0	21	0		0	310	0	0
IR Compressor	FHHQ	80-2500		Diesel	0	10.15	0		0	21	0		0	310	0	0
Engine Generator	MFPH			Propane	343	5.74	1,969	0.000091	0	21	0	0.00041	0	310	0	1,969
Engine Generator	Afterbay			Propane	0	5.74	0	0.000091	0	21	0	0.00041	0	310	0	0
Engine Generator	FM Dam			Propane	67	5.74	385	0.000091	0	21	0	0.00041	0	310	0	385
Engine Generator	RAPH			Propane	425	5.74	2,440	0.000091	0	21	0	0.00041	0	310	0	2,440
Toyota Forklift	FHHQ	54-2400		Propane	22	5.74	126	0.000091	0	21	0	0.00041	0	310	0	126
Total CO₂ (kg)						4,919	Total CH₄ (g)	0	GWP equiv	0	Total N₂O (g)	0	GWP equiv	0	0	4,919
Total CO₂ (metrictons)						4.9					0.0				0.0	5

Power Services 2007 Generator and Miscellaneous Emissions Calculations

Engine Type	Location	HP/RPM	Engine Size	Fuel Type	Fuel (gal)	2006 CO ₂ /Gal (Kg CO ₂ / Gal)	2007 CO ₂ / Year (Kg)	CH ₄ /mile (g/mile)	2007 CH ₄ / Year (grams)	CO ₂ Equivalent / Year (21:1)	2007 CH ₄ GWP (Kg)	N ₂ O/mile (g/mile)	2007 N ₂ O / Year (grams)	N ₂ O Equivalent / Year (310:1)	2007 N ₂ O GWP (Kg)	Total 2007 CO ₂ GWP
Engine Generator	Wakesha - FMPH	900rpm	2894ci - 6cyl	Diesel	0	10.15	0		0.00	21	0		0.00	310	0	0
IR Compressor	FHHQ	80-2500		Diesel	5	10.15	51		0.00	21	0		0.00	310	0	51
Engine Generator	MFPH			Propane	194	5.74	1,114	0.000091	0.02	21	0	0.00041	0.08	310	0	1,114
Engine Generator	Afterbay			Propane	147	5.74	844	0.000091	0.01	21	0	0.00041	0.06	310	0	844
Engine Generator	FM Dam			Propane	75	5.74	431	0.000091	0.01	21	0	0.00041	0.03	310	0	431
Engine Generator	RAPH			Propane	94	5.74	540	0.000091	0.01	21	0	0.00041	0.04	310	0	540
Toyota Forklift	FHHQ	54-2400		Propane	20	5.74	115	0.000091	0.00	21	0	0.00041	0.01	310	0	115
Total CO₂ (kg)						3,093	Total CH₄ (g)	0	GWP equiv	0	Total N₂O (g)	0	GWP equiv	0	0	3,093
Total CO₂ (metrictons)						3.1					0.0				0.0	3

Notes:
1. All factors from CCAR Protocol Version 3.0 April 2008 except electricity.

Appendix E
Greenhouse Gas Emission Calculations

Propane and Natural Gas Use Emissions Calculations

Fossil Fuel	2006 Fuel Consumption	2007 Fuel Consumption	MMBtu/Therm	MMBtu/gal	kg CO ₂ /MMBtu	2006 Kg CO ₂	2007 Kg CO ₂	kg CH ₄ /MMBtu	2006 CH ₄ (kg)	2007 CH ₄ (kg)	CO ₂ Equivalent / Year (21:1)	2006 CH ₄ CO ₂ Equiv	2007 CH ₄ CO ₂ Equiv	kg N ₂ O/MMBtu	2006 N ₂ O (kg)	2007 N ₂ O (kg)	N ₂ O Equivalent / Year (310:1)	2006 N ₂ O CO ₂ Equiv	2007 N ₂ O CO ₂ Equiv	2006 CO ₂ Equivalent Total	2007 CO ₂ Equivalent Total	
Propane (gal)	3,447	1,626		0.09	63.07	20,002	9,435	0.000091	0	0	21	1	0	0.000410	0	0	310	40	19	20,043	9,455	
					Total CO₂ (metric tons)	20.0	9.4					0.0	0.0					0.0	0.0		20	9
Natural Gas (Therm)	18,466	25,901	0.1		53.06	97,981	137,431	0.005900	11	15	21	229	321	0.000100	0	0	310	57	80	98,267	137,832	
					Total CO₂ (metric tons)	98.0	137.4					0.2	0.3					0.1	0.1		98	138

- Notes:**
1. Annual gas data calculations presented in Section 2
2. All factors from CCAR Protocol Version 3.0 April 2008 except electricity.

Appendix E
Greenhouse Gas Emission Calculations

2006 Emergency Generator Emissions Calculations

Location	kW	Run Time (Hrs)	Fuel Consumption Min Loads (gph)	Fuel Type	Estimated Fuel Use (gal)	2006 CO2/Gal (Kg CO2 / Gal)	2006 CO2 / Year (Kg)	CH4/mile (g/mile)	2006 CH4 / Year (grams)	CO2 Equivalent / Year (21:1)	2006 CH4 GWP (Kg)	N2O/mile (g/mile)	2006 N2O / Year (grams)	N2O Equivalent / Year (310:1)	2006 N2O GWP (Kg)	Total 2006 CO2 GWP
Lahontan Well	180	7.6	5.4	Diesel	41.04	10.15	417			21				310		
Alta WTP	35	53.4	1	Diesel	53.4	10.15	542			21				310		
Monte Vista WTP	50	66.4	1.5	Diesel	99.6	10.15	1,011			21				310		
Colfax WTP	175	30	5.3	Diesel	159	10.15	1,614			21				310		
Applegate WTP	90	48.6	2.7	Diesel	131.22	10.15	1,332			21				310		
Bowman WTP	135	32	4	Diesel	128	10.15	1,299			21				310		
Auburn Comm. Tower	108	16.1	4.7	Diesel	75.67	10.15	768			21				310		
Auburn WTP	1000	-	33	Diesel		10.15	0			21				310		
Auburn WQ/Admin	1000	-	33	Diesel		10.15	0			21				310		
Foothill WTP	1100	36	33	Diesel	1188	10.15	12,058			21				310		
Foothill WTP-Potable (02-01)	125	26	3.7	Diesel	96.2	10.15	976			21				310		
Foothill WTP-Potable (02-02)	50	1.2	1.5	Diesel	1.8	10.15	1,011			21				310		
Sunset Comm. Tower	30	21.1	1.8	Diesel	37.98	10.15	1,614			21				310		
Sunset WTP DMT	250	17.1	7.6	Diesel	129.96	10.15	1,332			21				310		
Whitney Res. Pump Station	450	19	11.5	Diesel	218.5	10.15	1,299			21				310		
Tinker Rd Pump Station	600	-	59	Diesel		10.15	768			21				310		
Stoneridge Pump Station	500	4.9	14.5	Diesel	71.05											
						Total CO2 (kg)	26,041	Total CH4 (g)	0	GWP equiv	0	Total N2O (g)	0	GWP equiv	0	0
						Total CO2 (metric tons)	26.0				0.0				0.0	0
Total	2,431.42															

2007 Emergency Generator Emissions Calculations

Location	kW	Run Time (Hrs)	Fuel Consumption Min Loads (gph)	Fuel Type	Estimated Fuel Use (gal)	2007 CO2/Gal (Kg CO2 / Gal)	2007 CO2 / Year (Kg)	CH4/mile (g/mile)	2007 CH4 / Year (grams)	CO2 Equivalent / Year (21:1)	2007 CH4 GWP (Kg)	N2O/mile (g/mile)	2007 N2O / Year (grams)	N2O Equivalent / Year (310:1)	2007 N2O GWP (Kg)	Total 2007 CO2 GWP
Lahontan Well	180	2.5	5.4	Diesel	13.5	10.15	137			21				310		
Alta WTP	35	80.2	1	Diesel	80.2	10.15	814			21				310		
Monte Vista WTP	50	6.6	1.5	Diesel	9.9	10.15	100			21				310		
Colfax WTP	175	13.7	5.3	Diesel	72.61	10.15	737			21				310		
Applegate WTP	90	11.9	2.7	Diesel	32.13	10.15	326			21				310		
Bowman WTP	135	8.3	4	Diesel	33.2	10.15	337			21				310		
Auburn Comm. Tower	108	3.4	4.7	Diesel	15.98	10.15	162			21				310		
Auburn WTP	1000	7.2	33	Diesel	237.6	10.15	2,412			21				310		
Auburn WQ/Admin	1000	2.7	33	Diesel	89.1	10.15	904			21				310		
Foothill WTP	1100	6.9	33	Diesel	227.7	10.15	2,311			21				310		
Foothill WTP-Potable (02-01)	125	1.8	3.7	Diesel	6.66	10.15	68			21				310		
Foothill WTP-Potable (02-02)	50	4.3	1.5	Diesel	6.45	10.15	100			21				310		
Sunset Comm. Tower	30	6.9	1.8	Diesel	12.42	10.15	737			21				310		
Sunset WTP DMT	250	6.6	7.6	Diesel	50.16	10.15	326			21				310		
Whitney Res. Pump Station	450	9.2	11.5	Diesel	105.8	10.15	337			21				310		
Tinker Rd Pump Station	600	3	59	Diesel	177	10.15	162			21				310		
Stoneridge Pump Station	500	3.2	14.5	Diesel	46.4											
						Total CO2 (kg)	9,971	Total CH4 (g)	0	GWP equiv	0	Total N2O (g)	0	GWP equiv	0	0
						Total CO2 (metric tons)	10.0				0.0				0.0	0
Total	1,216.81															

Notes:
1. All factors from CCAR Protocol Version 3.0 April 2008 except electricity.

Appendix E
Greenhouse Gas Emission Calculations

Electrical Use Emissions Calculations

Electrical Utility	2006 Consumption ¹	2007 Consumption ¹	PG&E lbs CO2 emissions per kWh ²	2006 lbs CO2	2007 lbs CO2	lbs per metric ton	2006 CO2 (Metric Tons)	2007 CO2 (Metric Tons)
PG&E (kWh)	5,065,781	8,562,182	0.45581	2,309,034	3,902,728	2,205	1,047	1,770
City of Roseville (kWh)	1,727	1,834	0.45581	787	836	2,205	0.4	0.4
Sierra Pacific (kWh)	442,477	264,420	0.45581	201,685	120,525	2,205	91	55
Total	5,509,985	8,828,436	0.45581	2,511,506	4,024,089	2,205	1,139	1,825

Notes:

1. CO2 equivalent emission factor provided by PG&E
2. All factors from CCAR Protocol Version 3.0 April 2008 except electricity.
3. Annual electricity data calculations presented in Section 2

Appendix E
Greenhouse Gas Emmision Calculations

Tetrafluoroethane Emissions Calculations

Date	Vehicle Number	Amount Recovered Lbs	Amount Installed Lbs	Amount Emitted Lbs	lbs/kg	Kg r-134a emitted	GWP of r-134a	Metric Tons of CO2 equivalent
8/1/2005	96-61	0.25	2.00	1.75				
8/8/2005	00-78	1.50	2.00	0.50				
5/3/2006	98-54	3.80	2.00					
6/15/2006	04-22	0.15	2.00	1.85				
6/20/2006	98-69	0.43	2.00	1.57				
6/26/2006	98-37	-	1.80	1.80				
6/26/2008	01-86	2.50	2.60	0.10				
7/18/2006	01-82	2.00	2.00	-				
8/24/2006	96-06	-	2.00	2.00				
8/29/2006	96-14	0.67	2.00	1.33				
2006 Total		9.55	16.40	8.65	0.45359	3.92	1300	5.10
6/14/2007	02-95	2.45	2.60	0.15				
6/19/2007	96-60	1.65	2.00	0.35				
8/15/2007	00-77	0.91	2.00	1.09				
8/30/2007	97-64	-	2.00	2.00				
2007 Total		5.01	8.60	3.59	0.45359	1.63	1300	2.12
2/13/2008	98-54	-	2.75	2.75				
3/19/2008	04-29	1.23	-					
4/7/2008	04-29	-	2.00	2.00				
2008 Total	Total	32.10	58.75	31.48				

Notes:

1. All factors from CCAR Protocol Version 3.0 April 2008 except electricity.

APPENDIX F: EXAMPLE SOLAR PROJECTS AT WATER DISTRICTS

Appendix F

Solar Power Guide

Water and WW Agency, Solar Project Summary

7/10/2008 16:00

Project	Location	Project Capacity, kW	Project Developer	Solar Panel Manufacturer	Panel Size, Watts	No. of Solar Panels	Yearly Electric Output, kWhr	Annual Capacity Factor	Claimed System Cost	System Cost per kW	Claimed Yearly Cost Savings	Area covered, sq feet	PV area, square feet per kW	Year Built	Remarks
South San Joaquin Irrigation District	Oakdale, CA	1,176	Sun Technics	Solar Sun Technics	175	6720	N/A	N/A	\$7,800,000	\$6,633		161,280	137	2008	single axis rotating array; was to be 2 MW
Northern California Power Authority Pump Station	Clearlake, CA	1,000	SPG Solar	N/A	160	6300	N/A	N/A	N/A	N/A		570,000	570	2008	at Lake County SD treatment plant
Alvarado Water Treatment Plant	San Diego, CA	945	Sun Edison	N/A		6128	N/A	N/A	\$7,000,000	\$7,407	\$40,000	96,516	102	2007	Cover 4.33 acres, on top of 3 buried concrete water tanks
Hills Canyon Water Treatment Plant	Thousand Oaks, CA	584	Sunpower	Sunpower	210	2783	N/A	N/A	N/A	N/A		108,900	186	2007	ground tracker system
Las Vegas Water District, Spring Preserve	Las Vegas, NV	409	Nevada Power	Sunpower	186	2200	765,793	21.4%	N/A	N/A		N/A	N/A	2007	tracker system
Airport Larkfield Wikipup WTP, Sonoma County Water Agency	Santa Rosa, CA	596	SPG Solar	Sharp Solar	180	3312	N/A	N/A	N/A	N/A		N/A	N/A	2007	ground mounted array
Cucamonga Valley Water District	Cucamonga, CA	213	Shell Solar (now Solar World)		N/A	N/A	N/A	N/A	\$1,600,000	\$7,512	\$87,145	N/A	N/A	2006	ground arrays
Desert Water Agency	Palm Springs, CA	300	Shell Solar (now Solar World)		N/A	N/A	N/A	N/A	\$2,500,000	\$8,333		N/A	N/A	2006	SGIP financed
Vallecitos Water District	San Marcos, CA	341	SPG Solar	Sharp Solar	208	1966	N/A	N/A	\$2,500,000	\$7,334		N/A	N/A	2006	carport canopy type, 160 spaces
EID Wastewater Treatment Plant	El Dorado Hills, CA	900	Renewable Technology Inc	N/A	156	5760	N/A	N/A	\$5,540,000	\$6,156		81,100	90	2006	ground mounted array
Atlantic City Utility Authority WWTP	Atlantic City, NJ	500	N/A	N/A	185	2700	660,000	15.1%	\$3,250,000	\$6,500		N/A	N/A	2006	ground mounted, roof mounted and canopy
Santa Clara Valley Water District	San Jose, CA	200	N/A	N/A	N/A	N/A	333,000	19.0%	\$2,400,000	\$12,000		N/A	N/A	2006	admin building and parking canopy
Elsinore Valley Municipal Water Dist	Lake Elsinore, CA	756	PowerLight	PowerLight	N/A	N/A	N/A	N/A	\$6,000,000	\$7,937		57,000	75	2006	roof mounted + parking canopy; gets 85% of planned savings
West Basin Municipal Water District	El Segundo, CA	564	Sunpower (design by PowerLight)	SunPower	200	2848	783,000	15.8%	\$4,000,000	\$7,092	\$100,000	60,000	106	2006	roof tiles on the in ground water tank
Las Vegas Water District, Ranzona Reservoir	Las Vegas, NV	821	Nevada Power	SunPower	205	4005	1,595,715	22.2%	N/A	N/A		N/A	N/A	2006	tracker system
Las Vegas Water District, Apache Reservoir	Las Vegas, NV	353	Nevada Power	SunPower	208	1695	681,309	22.0%	N/A	N/A		N/A	N/A	2006	tracker system
Las Vegas Water District, Grand Canyon	Las Vegas, NV	320	Nevada Power	SunPower	201	1590	639,106	22.8%	N/A	N/A		N/A	N/A	2006	tracker system
Las Vegas Water District, Spring Mountain	Las Vegas, NV	537	Nevada Power	SunPower	208	2585	1,037,039	22.0%	N/A	N/A		N/A	N/A	2006	tracker system
Las Vegas Water District, Luce Reservoir	Las Vegas, NV	555	Nevada Power	SunPower	208	2670	1,037,242	21.3%	N/A	N/A		N/A	N/A	2006	tracker system
Admin Center, Sonoma County Water Agency	Santa Rosa, CA	522	PowerLight	PowerLight	190	2752	877,500	19.2%	N/A	N/A		38,000	73	2006	roof mounted + parking canopy
Semitropic Water Storage District	Wasco, CA	980	Shell Solar	Shell Power	510	1920	1,729,000	20.1%	\$6,000,000	\$6,122	\$277,000	N/A	N/A	2005	single axis trackers
Southeast WWTP	San Francisco, CA	255	PowerLight	PowerLight	190	1344	N/A	N/A	N/A	N/A		20,000	78	2005	roof tiles
South Feather Water & Power Agency	Oroville, CA	566	N/A	Sharp Solar	185	3060	N/A	N/A	\$4,000,000	\$7,067		100,000	177	2004	ground mounted array
City of Vallejo, Water District Pumping Station	Vallejo, CA	225	BP Solar	BP Solar	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	2003	ground mounted array
Santa Cruz WWTP	Santa Cruz, CA	50.4	REC Solar	Astropower	120	420	83,600	18.9%	N/A	N/A		N/A	N/A	2001	tank mounted

total, kW 13,668
average, kW 547

average 20.0% \$7,508



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