



Comprehensive Energy Audits for City Owned Buildings & Facilities

February 22, 2011

Contents

Executive Summary

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Executive Summary

As part of an initiative to reduce energy cost and consumption, lower greenhouse gas emissions, and become as energy efficient as possible, The City of Bristol has secured the services of Camp Dresser and McKee (CDM) to perform a comprehensive energy audit for 65 buildings & facilities owned and operated by the City in an effort to develop comprehensive Energy Conservation and Retrofit Measures (ECRMs).

CDM's energy audit team visited the facilities August 30th through September 3rd. As a result of the site visit and evaluation of the historical energy usage of the facilities, CDM was successful in identifying opportunities for energy savings measures.

CDM has also evaluated the potential for renewable energy technologies to be implemented at the City's facilities to offset the electrical energy usage. Specifically, the use of solar electric photovoltaic panels and wind turbines were investigated. Additionally, the potential to generate biogas for fuel for a cogeneration system at the wastewater plant and a hydroelectric system at the wastewater plants outfall were evaluated.

As the City is currently involved in the purchase of natural gas via the Capital Region Council of Governments (CRCOG) and electricity via the Connecticut Conference of Municipalities (CCM) it is advised the City continue to purchase utilities in this manner to continue to take advantage of competitive pricing in the deregulated market. Additionally, it is noted that the Water Pollution Control Facility currently and should continue to participate in the Demand Response Program as discussed in Section 5.2.

Not all ECRMs identified as a result of the energy audit are recommended. ECRMs must be economically feasible to be recommended to the City for implementation. The feasibility of each ECRM was measured through a simple payback analysis. The simple payback period was determined after establishing Engineer's Opinion of Probable Construction Cost estimates, Operation and Maintenance (O&M) cost estimates, projected annual energy savings estimates, and the potential value of rebates, or Renewable Energy Credits, if applicable. ECRMs with a payback period of 20 years or less are generally recommended.

Historical Energy Usage

The following table, Table ES-1, summarizes the historical energy usage at each of the City's facilities as presented in Section 3. The data in Table ES-1 has been taken from account and facilities information provided by the City. These values can serve as a bench-marking tool, along with the building profiles that have been established through the EPA's Portfolio Manager Program, to quantify the reduction in electrical energy, natural gas and fuel oil usage following the implementation of the recommended ECRMs.

Table ES-1: Summary of Annual Energy Usage & Cost									
	Electrical Energy Use (kWh)	Peak Summer Demand (kW)	Peak Winter Demand (kW)	NG Use for Entire Building (therms)	Fuel Oil Use (Gallons)	Cost for Electric Service	Cost for Natural Gas	Cost for Fuel Oil	Total Energy Cost
CITY HALL									
CITY HALL	828,117	304	182	1,690	20,747	\$145,861	\$3,684	\$36,689	\$186,234
CITY HALL ANNEX	8,437	3	2	N/A		\$1598	N/A	N/A	\$1,598
WATER DEPARTMENT									
MAIN OFFICE	65,685	32	22	N/A	1,378	\$7,332	N/A	\$2,437	\$9,769
GARAGE	Included in the Main Office								
WATER FILTRATION PLANT	1,376,547	309	267	N/A	14,638	\$215,428	N/A	\$25,886	\$241,314
WELL HOUSE #1	22,067	26	9	N/A	N/A	\$5,295	N/A	N/A	\$5,295
WELL HOUSE #2	267,401	80	84	N/A	N/A	\$49,647	N/A	N/A	\$49,647
WELL HOUSE 3,4,5	513,681	95	101	N/A	N/A	\$81,395	N/A	N/A	\$81,395
CHEMICAL & CONTROL BLDG	7,711	N/A	N/A	N/A	N/A	\$2,291	N/A	N/A	\$2,291

Table ES-1: Summary of Annual Energy Usage & Cost									
	Electrical Energy Use (kWh)	Peak Summer Demand (kW)	Peak Winter Demand (kW)	NG Use for Entire Building (therms)	Fuel Oil Use (Gallons)	Cost for Electric Service	Cost for Natural Gas	Cost for Fuel Oil	Total Energy Cost
PUMP & CONTROL GENERATOR BLDG (HILL)	106,183	124	149	N/A	1,531	\$27,070	N/A	\$2,707	\$29,778
PUMP & CONTROL BLDG (PECK)	86,066	65	74	N/A	N/A	\$19,229	N/A	N/A	\$19,229
PUMP & CONTROL (WOLCOTT)	23,651	47	45	N/A	N/A	\$9,326	N/A	N/A	\$9,326
POLICE DEPARTMENT									
POLICE/COURT COMPLEX & PARKING GARAGE	1,158,360	247	214	N/A	32,062	\$180,650	N/A	\$56,698	\$237,348
PARKS & RECREATION									
ROCKWELL PARK	24,993	10	10	N/A	1,927	\$7,769	N/A	\$3,408	\$11,177
ROCKWELL PAVILION	10,936	46	8	N/A	1,333	\$7,009	N/A	\$2,357	\$9,366
BATHHOUSE	55,337	24	27	N/A	N/A	\$16,857	N/A	N/A	\$16,857
MUZZY FIELD	63,739	210	221	121	N/A	\$36,177	\$714	N/A	\$36,891
SKI LODGE	12,046	4	11	N/A	N/A	\$3,864	N/A	N/A	\$3,864

Table ES-1: Summary of Annual Energy Usage & Cost									
	Electrical Energy Use (kWh)	Peak Summer Demand (kW)	Peak Winter Demand (kW)	NG Use for Entire Building (therms)	Fuel Oil Use (Gallons)	Cost for Electric Service	Cost for Natural Gas	Cost for Fuel Oil	Total Energy Cost
PAGE PARK PAVILION	3,839	6	6	N/A	3,656	\$1,710	N/A	\$6,465	\$8,175
RECREATION BLDG	772	2	1	1068	N/A	\$674	\$2,562	N/A	\$3,236
FIRE DEPARTMENT									
HEADQUARTERS	109,269	29	25	N/A	6,515	\$19,128	N/A	\$11,521	\$30,649
CO 2	39,734	21	16	N/A	3,121	\$7,568	N/A	\$5,519	\$13,087
CO 3	21,219	9	9	3264	N/A	\$4,289	\$5,987	N/A	\$10,276
CO 4	29,620	10	11	N/A	2,748	\$5,612	N/A	\$4,860	\$10,472
CO 5	28,169	11	12	N/A	2,047	\$5,586	N/A	\$3,620	\$9,205
SENIOR CENTER									
SENIOR CENTER	307,573	133	92	20165	N/A	\$59,636	\$35,117	N/A	\$94,753

Table ES-1: Summary of Annual Energy Usage & Cost									
	Electrical Energy Use (kWh)	Peak Summer Demand (kW)	Peak Winter Demand (kW)	NG Use for Entire Building (therms)	Fuel Oil Use (Gallons)	Cost for Electric Service	Cost for Natural Gas	Cost for Fuel Oil	Total Energy Cost
LIBRARIES									
MAIN LIBRARY	606,363	206	129	15856	N/A	\$105,690	\$31,974	N/A	\$137,664
PUBLIC LIBRARY	129,559	65	33	9462	N/A	\$10,159	\$17,721	N/A	\$27,880
YOUTH SERVICES									
YOUTH SERVICES	44,272	19	13	N/A	2,654	\$13,550	N/A	\$4,693	\$18,243
PUBLIC WORKS									
ANIMAL CONTROL	N/A	N/A	N/A	1870	N/A	N/A	\$3,647	N/A	\$3,647
COMMUNITY SERVICES	0.4	N/A	N/A	N/A	N/A	\$441	N/A	N/A	\$441
HILL STREET	588	1	1	N/A	N/A	\$670	N/A	N/A	\$670
CITY YARD	127,983	30	33	20006	N/A	\$11,293	\$30,011	N/A	\$41,304
TRANSFER STATION	21,654	6	12	N/A	N/A	\$4,256	N/A	N/A	\$4,256

Table ES-1: Summary of Annual Energy Usage & Cost									
	Electrical Energy Use (kWh)	Peak Summer Demand (kW)	Peak Winter Demand (kW)	NG Use for Entire Building (therms)	Fuel Oil Use (Gallons)	Cost for Electric Service	Cost for Natural Gas	Cost for Fuel Oil	Total Energy Cost
TRANSFER STATION HUT	2,951	2	4	N/A	N/A	\$1,290	N/A	N/A	\$1,290
WPCP	3,570,896	680	637	33256	N/A	\$549,761	\$54,658	N/A	\$604,419
BOIVIN PS	23,866	N/A	N/A	N/A	N/A	\$4,323	N/A	N/A	\$4,323
BROAD ST PS	1,130,318	288	527	N/A	N/A	\$196,461	N/A	N/A	\$196,461
CHERRY HILL PS	11,765	7	9	N/A	N/A	\$2,520	N/A	N/A	\$2,520
CROSS PS	64,746	26	27	N/A	N/A	\$11,971	N/A	N/A	\$11,971
DRAYLA PS	462	1	2	N/A	N/A	\$587	N/A	N/A	\$587
EAST MAIN PS	85,901	24	60	N/A	N/A	\$15,987	N/A	N/A	\$15,987
IVY PS	14,405	4	5	N/A	N/A	\$2,570	N/A	N/A	\$2,570
JULIA PS	88,519	20	50	N/A	N/A	\$15,418	N/A	N/A	\$15,418
LAKE PS	40,217	40	39	N/A	N/A	\$10,198	N/A	N/A	\$10,198

Table ES-1: Summary of Annual Energy Usage & Cost									
	Electrical Energy Use (kWh)	Peak Summer Demand (kW)	Peak Winter Demand (kW)	NG Use for Entire Building (therms)	Fuel Oil Use (Gallons)	Cost for Electric Service	Cost for Natural Gas	Cost for Fuel Oil	Total Energy Cost
LUFKIN PS	5,610	4	6	N/A	N/A	\$2,150	N/A	N/A	\$2,150
MATTHEWS PS	34,876	12	19	N/A	N/A	\$6,509	N/A	N/A	\$6,509
MIDDLE PS	36,716	23	21	N/A	N/A	\$7,167	N/A	N/A	\$7,167
MINOR PS	37,197	12	18	N/A	N/A	\$6,672	N/A	N/A	\$6,672
TYLER PS	22,576	10	14	N/A	N/A	\$4,411	N/A	N/A	\$4,411

Table ES-2 Energy Consumption Summary			
Electrical Use (kWh)	Natural Gas Use (Therms)	Fuel Oil Use (Gallons)	Total Cost
11,272,592	104,888	94,357	\$2,292,156

City of Bristol - Annual Energy Use

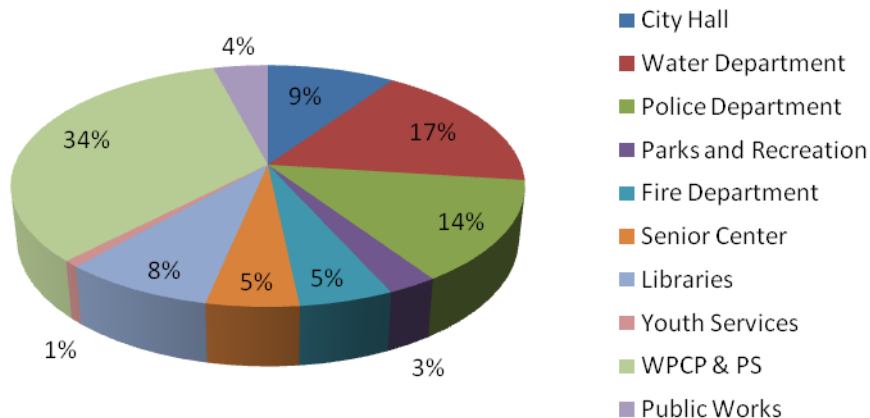
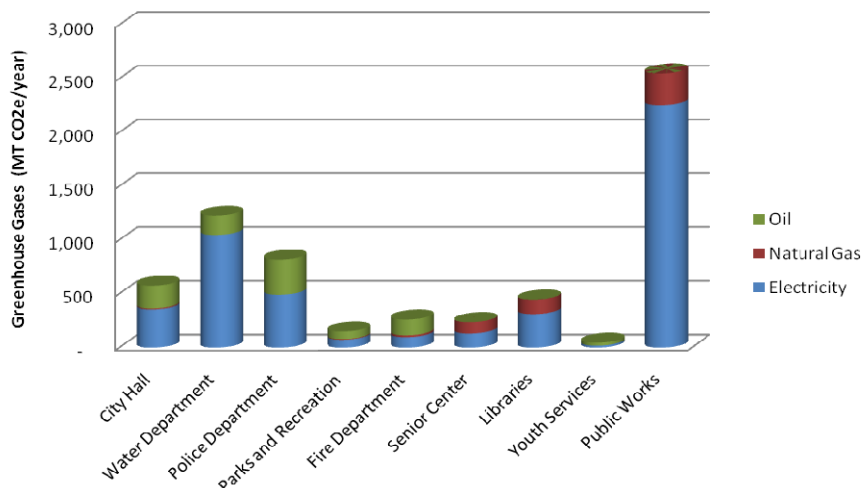


Table ES-3 Greenhouse Gas Emissions (CO ₂ e/Year)			
Electricity	Natural Gas	Oil	Total
4,780 Metric Tons	567 Metric Tons	966 Metric Tons	6,313 Metric Tons

Direct and Indirect Greenhouse Gas Emissions By Departments



Recommended ECRMs

The following Table ES-4 presents the ranking of recommended ECRMs identified for the water and wastewater process systems. Table ES-5 presents the ranking of recommended ECRMs identified for the building lighting systems. Table ES-6 presents the ranking of recommended ECRMs identified for the building HVAC systems.

Additional ECRMs associated with the building envelope and other miscellaneous appliances were identified and evaluated, as discussed in Sections 2 and 4. Section 4.6 presents a number of different plug load reduction techniques that are recommended to be implemented throughout the City's facilities; including smart strips, vending misers, energy star appliances and a computer management software program. Some of the building envelope measures were not recommended due to longer payback periods. This table includes the Engineer's Opinion of Probable Construction Cost, projected annual energy cost savings, projected annual energy usage savings, and total simple payback period for each recommended ECRM. The ECRMs are ranked based on payback period.

Water and Wastewater Process Systems

Table ES-4 includes the recommended ECRMs to provide energy savings for the water and wastewater treatment systems. An evaluation to convert the sludge storage tanks back to digesters was included. Should the City wish to consider this further, it would be recommended that a separate detailed engineering analysis be completed as part of an overall long-term sludge management plan. Detailed discussions on the ECRMs considered are presented in Section 4.1. As discussed in Section 4.1, the water treatment system recommendations mainly consisted of motor and VFD retrofits, which are included in Table ES-9.

Table ES-4 Ranking of Energy Savings Measures Summary – Water and WWTP System Retrofits					
Overall Ranking ¹	Process ECRM	Total Cost ²	Annual Energy Savings (kWh)	Annual Fiscal Savings ³	Simple Payback (Years)
1	Spray Water Pumps – Programmable Timer	\$9,048	90,909	\$10,200	0.9
2	Anoxic Zone Mixing – Hyperbolic Mixers	\$208,828	127,991	\$23,726	8.8
3	UV System – Flow Pacing Integration	\$147,839	63,128	\$9,722	15.2
4	Hydroelectric System	\$288,816	52,560	\$7,394	39.1

1. The Overall Ranking is based on the simple payback period.
2. 'Total Cost' takes into account any applicable rebates.
3. 'Annual Fiscal Savings' takes into account maintenance costs savings.

Table ES-5
Lighting System Improvements¹

Overall Ranking	Facility Measure	Total Cost	Energy Savings (kWh)	Annual Fiscal Savings²	Simple Payback (Years)
1	City Hall Annex - Total	\$1,158.2	2,598.9	\$551.5	2.1 Years
2	Water Department - #3 Well House - Total	\$71.9	47.0	\$34.2	2.1 Years
3	Water Pollution Control - Operations- Total	\$35.9	23.5	\$17.1	2.1 Years
4	Public Works - Transfer Station Hut - Total	\$4,854.4	4,595.5	\$2,022.7	2.4 Years
5	Parks and Recreation - Recreation Building - Total	\$1,036.4	467.5	\$414.6	2.5 Years
6	Bristol Fire - Engine 2 - Total	\$3,648.4	7,268.0	\$1,403.2	2.6 Years
7	Bristol Fire - Engine 5 - Total	\$6,087.5	10,634.9	\$2,254.6	2.7 Years
8	Bristol Fire - Engine 3 - Total	\$5,351.5	9,440.8	\$1,911.3	2.8 Years
9	Parks and Recreation - Bathhouse - Total	\$1,318.2	576.6	\$387.7	3.4 Years
10	Public Works - Hill Street - Total	\$4,709.1	1,085.9	\$1,308.1	3.6 Years
11	Police Court - Total	\$22,963.0	31,099.1	\$5,740.8	4.0 Years
12	City Hall - Total	\$10,595.7	7,409.9	\$2,037.6	5.2 Years

Table ES-5
Lighting System Improvements¹

Overall Ranking	Facility Measure	Total Cost	Energy Savings (kWh)	Annual Fiscal Savings²	Simple Payback (Years)
13	Public Works - City Yard - Total	\$12,864.2	12,465.5	\$2,473.9	5.2 Years
14	Parks and Recreation - Rockwell Pavilion - Total	\$1,048.8	251.5	\$187.3	5.6 Years
15	Water Department - Water Filtration Plant - Total	\$1,779.8	230.9	\$306.9	5.8 Years
16	Water Department - #1 Well House - Total	\$1,874.9	567.0	\$297.6	6.3 Years
17	Parking Garage - Total	\$11,830.6	9,828.7	\$1,620.6	7.3 Years
18	Water Department - High Service Pump Station - Total	\$1,630.1	989.5	\$209.0	7.8 Years
19	Public Library - Total	\$4,542.8	2,659.5	\$547.3	8.3 Years
20	Youth Services - Main Building - Total	\$3,380.1	964.0	\$375.6	9.0 Years
21	Water Department - Main Office - Total	\$9,170.5	6,003.5	\$965.3	9.5 Years
22	Water Department - #4 Well House - Total	\$71.9	47.0	\$7.5	9.6 Years
23	Water Department - #5 Well House - Total	\$815.1	248.5	\$66.3	12.3 Years
24	Parks and Recreation - Muzzy Field - Total	\$12,389.1	1,647.4	\$938.6	13.2 Years

Table ES-5
Lighting System Improvements¹

Overall Ranking	Facility Measure	Total Cost	Energy Savings (kWh)	Annual Fiscal Savings²	Simple Payback (Years)
25	Public Works - Transfer Station Scale House - Total	\$2,229.6	836.6	\$165.2	13.5 Years
26	Water Department - Chemical and Control - Total	\$941.6	220.0	\$68.7	13.7 Years
27	Parks and Recreation - Rockwell Park - Total	\$7,590.0	1,060.0	\$538.3	14.1 Years
28	Public Works - Community - Total	\$503.4	36.9	\$33.6	15.0 Years
39	Parks and Recreation - Page Park Pavillion - Total	\$5,297.0	782.9	\$348.5	15.2 Years
30	Senior Center - Total	\$20,743.0	6,387.4	\$1,329.7	15.6 Years
31	Water Department - Generator - Total	\$1,479.6	308.5	\$91.3	16.2 Years
32	Water Department - #2 Well House - Total	\$743.2	201.5	\$38.5	19.3 Years

1. Engineers Probable Construction Cost takes into account any applicable rebates.

2. Annual Fiscal Savings takes into account additional O&M cost or savings associated with the measure.

Table ES-6
Ranking of Energy Savings Measures Summary – HVAC Improvements

Overall Ranking	Complex	Retrofit Cost	Incentives	Total Cost ¹	Energy Savings	Annual Fiscal Savings ²	Simple Payback (Years)
1	Fire Department – Pipe Insulation	\$1,150	\$0	\$1,150	569 Gallons; 107 Therms	\$1,201	1.0
2	Police Department – Air Handler	\$15,041	\$0	\$15,041	701 Gallons; 27,000 kWh	\$5,451	2.8
3	WPD – Headworks Preheat	\$25,078	\$0	\$25,078	1,583 therms	\$2,469	10.2
4	Senior Center – Boiler Upgrade	\$134,479	\$0	\$134,479	6,332 Therms	\$12,526	10.7
5	Senior Center – DDC	\$68,251	\$0	\$68,251	2,021 Therms; 12,121 kWh	\$5,867	11.6
6	WPD – Headworks Heat pump	\$109,336	\$6,000	\$103,336	-56,916 kwh, 10,786 therms	\$8,061	12.8
7	Muzzy Field – Generator	\$160,106	\$0	\$160,106		\$12,425	12.9
8	Recreation Building – Unit Heater Upgrade	\$8,418	\$0	\$8,418	205 Therms	\$605	13.9
9	City Hall – CRAC Upgrade	\$55,452	\$0	\$55,452	21,356 kWh	\$3,759	14.7
10	Public Library – Boiler Upgrade	\$70,347	\$0	\$70,347	1,995 Therms	\$4,487	15.7
11	Water Filtration Plant Building – Boiler Upgrade	\$107,370	\$0	\$107,370	4,084 Gallons	\$6,755	15.9
12	City Hall Annex – Furnace Upgrade	\$8,418	\$0	\$8,418	197 Therms	\$463	18.2
13	City Hall – Pipe Insulation	\$497	\$0	\$497	150 kWh	\$26	19.1

1. 'Total Cost' takes into account any applicable rebates.
2. 'Annual Fiscal Savings' takes into account maintenance costs savings.

Renewable Energy Technologies

Solar Energy

Section 4 of the report provides for an economic evaluation of a solar energy system recommended to be installed at several of the City's facilities. The evaluation covered the economic feasibility of the City installing a solar energy system under a typical construction contract and to assume full responsibility of the operation of such a system.

Based on a simple payback model, summarized in Table ES-7, it would not benefit the City to further investigate the installation of a solar energy system at the 29 most applicable buildings evaluated. This is primarily based on the initial upfront capital investment required for a solar energy system installation and the 57.2 year payback period. This combined payback period does not justify installing the 29 solar energy systems considered. However, installation at individual locations could be considered further, with a more in-depth design, as other funding options such as Power Purchase Agreements and Connecticut's Solar PV Program are potentially available to help finance a solar project. Solar technology is constantly changing and will most likely continue to lower in price.

Table ES-7 includes a simple payback analysis for the installation of a solar energy system at the identified City buildings & facilities.

Table ES-7: Simple Payback Analysis for Solar Energy Systems	
Estimated Budgetary Project Cost	\$38,902,536
1 st Year Production	3.59 MWh
Annual Electric Savings	\$589,993
Annual Estimated REC Revenue	\$89,754
Project Simple Payback	57.2

Wind Power Generation

Section 4 of the report provides for an economic evaluation of a wind turbine energy system recommended to be installed throughout the city of Bristol, CT. The evaluation covered the economic feasibility of furnishing and installing a wind turbine energy system under a typical construction contract and to assume full responsibility of the operation of such a system.

CDM completed a preliminary desktop wind power production analysis and has concluded that an additional on-site feasibility study is not warranted and not recommended, due to a 31 year payback period.

Table ES-8 includes a typical simple payback analysis for the installation of a wind turbine energy system located in the City of Bristol. Refer to Appendix J for a more detailed wind energy financing spreadsheet.

Table ES-8: Ranking of Energy Savings Measures Summary – Wind Turbine Energy System			
Parameter	Wind Turbine (Minimum Site Wind Speed – 4.2 m/s)	Wind Turbine (Maximum Site Wind Speed – 5.2 m/s)	Wind Turbine (Average Site Wind Speed – 4.6m/s)
Engineer's Opinion of Probable Cost	\$71,995	\$71,995	\$71,995
1 st Year Production	5,437 kWh	9,756 kWh	7,249 kWh
Annual Estimated Electric Savings	\$1,582.2	\$2,839	\$2,110
Annual Estimated REC Revenue	\$136	\$244	\$181
Project Simple Payback	42 Years	23 Years	31 Years

Motor Upgrades and VFD Addition ECRMs

Section 4.4 of the report provides for an economic evaluation of upgrading all motors over 10 HP to premium efficiency and adding variable frequency drives (VFDs) to select pumps.

Table ES-9 includes a simple payback analysis for the upgrade of motors and addition of VFDs.

Table ES-9 Ranking of Energy Savings Measures for Motor Upgrades and VFDs					
Overall Ranking	Site	Total Cost¹	Anticipated Annual Energy Savings	Annual Fiscal Savings²	Simple Payback (Years)
1	WTP - Pump Station and Well Houses	\$82,199	31,918	\$7,624	10.8
2	Water Pollution Control Plant (WPCP)	\$238,423	140,929	\$21,697	11
3	WPCP - Pump Stations	\$298,093	105,613	\$20,470	14.6

1. 'Total Cost' takes into account any applicable rebates.

Recommended ECRMs

Table ES-10 summarizes the Total Engineer's Opinion of Probable Construction Cost, annual energy savings, projected annual energy and O&M cost savings and the payback period based on the implementation of all of the above recommended ECRMs.

Table ES-10: Recommended ECRM's ¹			
Total Engineer's Opinion of Probable Construction Cost	Projected Annual Energy Savings	Projected Annual Fiscal Savings	Simple Payback Period (years)
\$2,065,686	10,857 Therms 1,270 Gallons 790,294 kWh	\$193,351	10.7

- Does not include energy savings associated with Solar Energy System or Wind Power Generation.

Table ES-11 ¹ Greenhouse Gas Emission Reductions (CO ₂ e/Year) for Recommended ECRM's			
Electricity	Natural Gas	Oil	Total
335 Metric Tons	58 Metric Tons	13 Metric Tons	406 Metric Tons

- Does not include savings associated with Solar Energy System or Wind Power Generation.

Section 1

Introduction

1.1 General

As part of an initiative to reduce energy cost and consumption, reduce harmful building emissions and increase overall energy efficiency, The City of Bristol has secured the services of Camp Dresser and McKee (CDM) to perform an energy audit at 65 facilities in an effort to develop comprehensive energy conservation initiatives.

The performance of an Energy Audit requires a coordinated phased approach to identify, evaluate and recommend energy conservation and retrofit measures (ECRM). The various phases conducted under this Energy Audit included the following:

- Gather preliminary data on all facilities;
- Facility inspection;
- Identify and evaluate potential ECRMs and evaluate renewable/distributed energy measures;
- Develop the energy audit report.

Figure 1-1 is a schematic representation of the phases utilized by CDM to prepare the Energy Audit Report.

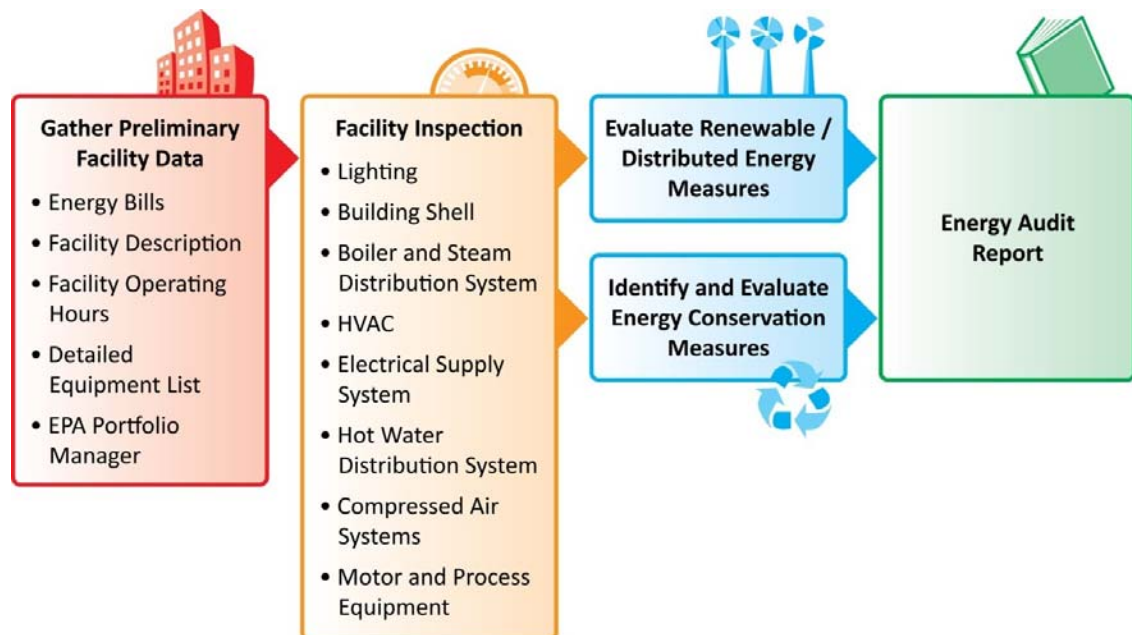


Figure 1-1: Energy Audit Phases

1.2 Background

The following facilities were included in the energy audit for the City of Bristol:

Department	ID	Facility	Area (S.F.)	Year Built	Number of Occupants	Hours of Operation
City Hall	1	City Hall	72000	1963		
	2	City Hall Annex	2250	1965	2	
Water Department	3	Main Office	7600	1926	4	8am - 5pm M-F
	4	Garage	4300	1991	2	Intermittent
	5	Water Filtration Plant	31420	1988	4	Continuous
	6	High Service Pump Station	576	1966	0	-
	7	#1 Well House	252	1948	0	-
	8	#2 Well House	256	2002	0	-
	9	#3 Well House	257	1965	0	-
	10	#4 Well House	257	1965	0	-
	11	#5 Well House	257	1965	0	-
	12	Chemical and Control	704	1965	0	-
	13	Chemical and Control	913	1957	0	-
	14	Generator	198		0	-
	15	Pump and Control	864	2001	0	-
	16	Pump and Control	1050	1966	0	-
	17	Generator	216	1999	0	-
	18	Pump and Control	610	2006	0	-
Bristol Police Department	19	Police Court	68077	1979		8-5 M-F, Others
	20	Parking Garage	48360	1979	2	Continuous
Parks and Recreation	21	Rockwell Park	2741	1950	4	-
	22	Rockwell Pavilion	2625	1963	50	Irregular, as needed
	23	Bathhouse	2574	1921	0	Currently vacant
	24	Muzzy Field	1000	1922		-
	25	Ski Lodge	665	1960		-
	26	Page Park Pavilion	2943	1963		-
	27	Recreation Building	2671	1955		-
Bristol Fire	28	Fire HQ	17880	1963	12	Office: 8-5 M-F Firehouse: continuous
	29	Engine 2	3826	1968	4	Continuous
	30	Engine 3	3212	1962	4	Continuous
	31	Engine 4	3572	1963	4	Continuous
	32	Engine 5	3450	1964	4	Continuous

Department	ID	Facility	Area (S.F.)	Year Built	Number of Occupants	Hours of Operation
Senior Center	33	Senior Center	53464	1956		
Library	34	Main Library	40000	1907	120	-
	35	Public Library	12846	1976	30	-
Youth Services	36	Main Building	6828	1900	12	-
Public Works	37	Animal Control	1800	1978	2	-
	38	Community Services	600	1959	0	-
	39	Hill Street	2466	1920	0	-
	40	City Yard	22740	1970		-
	41	Transfer Station	435	2004	3	M-F 7-3, Sa 7-1
	42	Transfer Station	2250	2004	0	M-F 7-3, Sa 7-1
Water Pollution Control	43	Admin	1800	1987	3	M-F 8-5
	44	Operations	7150	1987	8	-
	45	Headworks	3385	1987	0	-
	46	Primary	1280	1987	0	-
	47	Secondary	1440	1987	0	-
	48	Air Blower	1300	1987	0	-
	49	Pump House	2500	1987	0	
	50	Sludge Thickening	2500	1987	0	-
	51	Sludge Disposal	5980	1987	4	
	52	Broad Street	3200	1988	0	-
	53	Cherry Hill	250	1979	0	-
	54	Cross	250	1990	0	-
	55	Drayla	50	1976	0	-
	56	East Main	486	1986	0	-
	57	Ivy	250	1968	0	-
	58	Julia	300	1968	0	-
	59	Lake	250	1986	0	-
	60	Lufkin	210	2000	0	-
	61	Matthews	330	1976	0	-
	62	Middle	250	1978	0	-
	63	Minor	405	1975	0	-
	64	Boivin	0	1971	0	-
	65	Tyler	213	1996	0	-

1.3 Purpose and Scope

The objective of the energy audit is to identify energy conservation and retrofit measures to reduce energy usage and to develop an economic basis to financially validate the planning and implementation of identified energy conservation and retrofit measures.

Significant energy savings may be available with retrofits to the heating and cooling systems and lighting systems. It should be noted that the magnitude of energy savings available is not only dependent on the type of heating, lighting or insulation systems in use, but also on the age and condition of the equipment and the capital available to implement major changes. Due to the rising cost of power and the desire to minimize dependence on foreign oil supplies, energy consumption is taking a higher priority across the nation and feasible alternatives for reducing energy consumption and operating costs must be evaluated on a case-by-case basis.

The purpose of this energy audit is to identify the various critical building comfort systems that are major consumers of electrical energy and are clear candidates for energy savings measures. In addition, potential energy producing systems such as solar electric, ground source heat pumps, and wind energy systems were also evaluated. A discussion on these technologies is included in Section 4 Energy Conservation and Retrofit Measures (ECRM).

In addition to identifying ECRMs and the potential for on-site energy generation, there is potential for further energy cost savings through the use of a third party energy supplier and participation in a Demand Response Program. This is discussed further in Section 5.

Section 2

Facility Description

2.1 City Hall

2.1.1 City Hall

Description of Building Envelope

The energy audit included an evaluation of the building's envelope (exterior shell) to determine the components' effective R-values to be utilized in the building model and to locate and fix any thermal weaknesses that may be present. The components of a building envelope include the exterior walls, foundation and roof. The construction and material, age and general condition of these components, including exterior windows and doors, impact the building's energy use.

The building was constructed in 1963. The building utilizes an exo-concrete skeletal framing system where the concrete columns are visible from the exterior of the building. The building exterior walls are masonry with 4" brick veneer on 8" concrete block with window openings located at each column. From the original construction drawings it appears that there is no insulation within the exterior wall system. However, interior modifications in select areas may have added batt insulation and studs with gypsum board, i.e. data and telecom room. For the purpose of this audit we will assume the following R value calculation for the exterior wall. The building foundation walls are concrete with masonry veneer at the interior of the foundation walls. The majority of the foundation wall is in good condition with minor cracking at the foundation perimeter. The building and penthouse roof is a black rubber membrane stone ballasted system and in good condition. The roof utilizes six skylights in multiple locations, all are in good condition.

The building windows are aluminum framed with single pane glass and exterior storms. The windows are operable and in fair condition. The building windows are at the end of their life expectancy. The building main entrance storefront doors are single pane glass with double pane glass side lights and were installed approximately 10 years ago and in good condition. All other storefront entrances are original storefront doors and windows with single pane glass and in fair condition. The building garage door is an insulated galvanized steel door and in fair condition. The building hollow metal doors at basement level are in good condition, whereas the building hollow metal door at grade, next to the rollup door, is at the end of its life expectancy.

Existing R-Values:

■ Basement (below grade)	
Int. Air Film	R-0.68
12" Concrete	R-0.96
Total R-Value	R-1.64

■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-2.76
■ Windows and Doors	
Single Pane Glass	R-0.91
Storms	R-2.00
Total R-Value	R-2.91
Total Building Envelope R-Value	R-7.31

Description of Building HVAC

Building heating is provided by a central steam boiler plant in the building basement. The boiler plant is comprised of 2 Webster cast iron, oil fired boilers rated at 2,520 MBH. They are assumed to be 82% efficient. The boiler plant provides steam to the penthouse air handlers and a steam to hot water heat exchanger for the reheat loop. The building has 4 pipe fan coils and induction units that reheat the air based upon space temperature.

Building cooling is provided by a central chiller. The chiller is a water cooled Trane reciprocating chiller. The chilled water serves the penthouse air handlers and the 4 pipe fan coils and induction units that cool based upon space temperature. The condenser water is cooled by an evaporative cooling tower. The tower has a variable speed drive on the fan which is controlled by the building management system based upon tower water temperature. The MIS area, vault and telephone room have dedicated cooling systems. The vault and telephone room are split DX systems. The MIS area has computer room air conditioners, or CRAC units, with under floor air distribution and a glycol loop connected to fluid coolers.

The building is conditioned and ventilated primarily by the penthouse air handlers. These air handler's supply preheated or preconditioned air to the local fan coils or perimeter induction units. The building has local thermostats which operate the pneumatic three way valves on the local 4 pipe fan coil. The thermostats also communicate with the building management system. The valves and dampers of the building are still pneumatic. The building management system uses electro-pneumatic converters and new electronic sensors to control the building. Building humidity was found to be 50% relative humidity in the office area. Space temperatures varied throughout the building. Building occupants reported that the space temperature is not well maintained and the building has spots that are cold year round.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.1.2 City Hall Annex

Description of Building Envelope

The building was constructed in 1965. The building exterior walls are comprised of formed concrete columns with a masonry wall with 4" brick veneer over 8" concrete block that fills between the columns. The building foundation is concrete. The building roof is a black rubber membrane stone ballasted system.

The building windows are steel framed with single pane glass. The steel window frames are rusting and in poor condition. The building garage doors are made from wood and in fair condition. The building hollow metal door and hollow metal window with single pane glass are in fair condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
Ext. Air Film	R-0.17
Total R-Value	R-1.96
■ Windows and Doors	
Single Pane Glass	R-0.91
Hollow Metal Door	R-0.60
Garage Door (wood)	R-1.56
Total R-Value	R-3.07

Description of Building HVAC

The building is heated by 2 forced air, natural gas furnaces. The output capacities are 96 and 128 MBH and have efficiencies of 82% and 80.5% respectively. The furnaces are controlled by local thermostats. The building temperature is maintained to prevent equipment from freezing. Thermostats were set for a heating set point of 55°F.

The building has no cooling.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency

linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.2 Water Department

2.2.1 Main Office

Description of Building Envelope

The building was constructed in 1926. The building exterior walls are made from 4" brick with a wall thickness of 12". Over the years multiple renovations have occurred and various original exterior openings have been modified and in-filled with masonry and brick. The building foundation is concrete. The building roof is non-insulated sloped concrete.

The building windows are casement windows with single and double pane glass and are in fair condition. The building entrance storefront doors are single pane glass and are in fair condition. The building hollow metal door is in fair condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
4" Brick (12" solid)	R-2.40
Ext. Air Film	R-0.17
Total R-Value	R-3.25
■ Windows and Doors	
Single Pane Glass	R-0.91
Double Pane Glass	R-2.04
(1/2" air gap)	
Hollow Metal Door	R-0.60
Total R-Value	R-3.55

Description of Building HVAC

The building is heated by a central hot water boiler. The boiler is an AO Smith model 19A-S/W-05, oil fired, and rated at 560 MBH. The space is heated by perimeter radiation and hot water unit heaters. The drive up window has a 1000w electric resistance baseboard heater.

The core of the building is heated and cooled by a roof top heat pump. The unit is a Carrier 50PQ012510AA and is 20 years old. The building has dedicated cooling for the server closet and the meter shop. These spaces are cooled by DX split systems with outdoor condensers.

Building domestic hot water is produced by an electric storage water heater. The water heater is an AO Smith, 40 gallon, 4500w and is in good condition.

The building has 8 heating zones. Each zone is controlled by a local thermostat. The thermostats observed are programmable.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.2.2 Garage

Description of Building Envelope

The building was constructed in 1991. The building exterior walls are masonry with 4" brick veneer over 8" concrete block with 1-1/2" of rigid insulation that fills the wall cavity. The north wall of the building is all 8" concrete block. Vinyl siding accents the building gable face from the eave to ridge line. The building roof is pitched and constructed from wood trusses with asphalt shingles and insulation. The building soffit is perforated and attic vents are located at all gable locations.

The building has no windows or daylight openings. The building garage doors are insulated sectional doors and in good condition. The building hollow metal doors are in good condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
Wall Cavity	R-1.00
Rigid Insulation	R-7.50
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-11.26
■ Roof	
Asphalt Shingles	R-0.44
Sheathing	R-0.80
Batt Insulation	R-19.0
Total R-Value	R-20.24
■ Doors	
Hollow Metal Door	R-0.60
Garage Door (Steel/Insul.)	R-5.90
Total R-Value	R-6.50

Description of Building HVAC

The building is heated by gas fired unit heaters. The building has 4 units rated at an estimated 100 MBH each. These units are controlled by wall mounted thermostats. The thermostats were observed to be set at 52°F at the time of the audit.

The garage also has a paint storage closet. The paint closet is ventilated continuously by a single exhaust fan as required by code.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.2.3 Water Filtration Plant

The City of Bristol's Water Department serves approximately 85% of the population of Bristol with potable water. The potable water is provided by the operation of the conventional filtration treatment plant and via ground water supplied through the operation of five wells. The five wells produce over 2 million gallons per day (MGD) and the filtration plant having two process trains each designed to treat 6 MGD provides a total of 12 MGD. Therefore the total treated potable water capacity for the system is 14 MGD. In 2003, the Water Department had 16,211 residential, 1,540 commercial and 118 industrial accounts, equating to a daily demand of 5.29 million gallons per day (MGD).

Under normal conditions, the raw water supply to the plant is pumped from Reservoir No. 1 (Raw Water Pump Station), is metered and conveyed through a flow splitter box to the two process trains. The City recently installed a direct, gravity flow connection to the treatment plant from Reservoir No. 7 to bypass around Reservoir No. 1 and the other reservoirs as needed. The Raw Water Pump Station consists of four (4) constant speed pumps, each 2.25 MGD, for a total raw water flow of 9 MGD. One pump of the four is currently reported as inoperable.

The treatment process consists of 2-stage rapid mix basins, followed by flocculation, sedimentation and multi-media filters. Typically, one process train is operated during the winter and two during the summer. Alum, caustic soda and carbon are added to the rapid mix basins. The flocculation process consists of three tanks with sequentially slower mixing, to maximize the rate of flocculation without breakup of floc. The water then flows through the sedimentation basins for solids removal through gravity and then further through the gravity filtration process. After filtration, the water is treated with chlorine, fluoride and orthophosphate. The treatment plant has a relay based monitoring system. The facility indicated that they intend to switch from chlorine gas to sodium hypochlorite in the near future. Consideration may also be given to

alternatives to orthophosphate if the Bristol Water Pollution Control Facility receives a more stringent effluent phosphorus limit.

The treated water fills an on-site 2 MG storage tank built in 1997. The treated water is distributed via gravity to the 'High Service Area' and fills the 0.24 MG and 2.5 MG Grove Street tanks, or is pumped via the High Service Pump Station to the 'Hill Street Service Area'. The High Service Pump Station consists of four (4) 60 HP pumps each with a capacity of 700 gpm.

Treated water pumped to the Hill Street Service Area fills the 2 MG below ground Hill Street tank. From Hill Street, the treated water is pumped to the 3 MG above ground Chapel Street tank, where it then flows by gravity to the 2.5 MG Stevens St. tank and the Burlington Avenue area. Hill Street feeds the 0.6 MG Dewitt Drive Reservoir.

In the High Service Area, the Peck Lane pump station supplies the 0.6 MG Old Wolcott Road tank, where it then flows by gravity to the 1.5 MG South Mountain storage tank. The Wolcott Street pump station supplies the 1 MG Witches Rock Road tank.

A percentage of the treated water supply is stored on-site in two above ground tanks for filter backwash. The wash water is then recovered and treated in a small scale wash water treatment unit that consists of rapid mix and sedimentation, prior to being returned to the influent flow splitter box. The filters are back washed once a shift, three times a day, typically from 7:15-7:30 am, 3:30-4:30 pm, and at 1 am.

The output of the Hill Street pump station is controlled at the plant based on the Chapel Hill tank water level. The other pump stations in the distribution system operate automatically based on water level set points. Water level is continuously monitored in the storage tanks and operators aim to maintain set levels to ensure adequate water supply and pressure. It has been noted that water levels in the storage tanks have to be maintained between 2 and 4 feet of the high water levels at all times to ensure adequate pressure in the distribution system. As such, a peak/off-peak pumping schedule is not an option for the Bristol Water Department, as the fall from a few feet of storage volume over the 'peak' hours will result in not maintaining the pressure head required in the system. Therefore, the pumps and wells are operated 10 to 12 hours per day.

Tanks

There are eight storage tanks throughout the City. The following table, Table 2.2-1, summarizes the characteristics of the tanks.

Table 2.2-1: Water Supply Tanks					
	Capacity (MG)	Hydraulic Grade Level (HGL)(ft)	Low Water Level (ft)	High Water Level (ft)	Target Set Point (ft)
Chapel Street	3	1,068	14	99	98
Hill Street	2	814	10	20	18
South Mountain Street	1.5	446	36	45	41
Dewitt Drive	0.6	446	7	15	14
Grove Street	2.5	613	10	25	23
	0.24	609	10	25	23
Stevens Street	2.5	490	55	80	78
Old Wolcott Road	0.6	766	14	22	20
Witches Rock	1	1,094	UNK	UNK	UNK

Description of Building Envelope

The building was constructed in 1988. The building exterior walls are a masonry cavity wall system. This wall system is comprised of 4" brick façade over 8" concrete block, which vary in depth from 14" to 16". The wall cavity is 2¾" with rigid insulation of 1½" to 2" thick that fills the wall cavity. The building foundation is concrete and in good condition. The building roof is a black rubber membrane stone ballasted roof system with tapered insulation over a minimum of 3" of rigid insulation. The roof is in fair condition. The roof features forty skylights and conditions of all skylights have not been confirmed.

The building windows are aluminum framed with 1" insulated glass and in good condition. The building entrance storefront doors are aluminum framed with single pane glass and in good condition. The building garage doors are insulated steel doors and in good condition. The building hollow metal doors are in fair condition.

Existing R-Values:

- Basement (below grade)
Int. Air Film R-0.68

	14" Concrete	R-1.12
	Ext. Air Film	R-0.17
	Total R-Value	R-1.97
■	Structure (above grade)	
	Int. Air Film	R-0.68
	8" CMU	R-1.11
	Wall Cavity	R-1.00
	Rigid Insulation	R-7.50
	4" Brick	R-0.80
	Ext. Air Film	R-0.17
	Total R-Value	R-11.26
■	Windows and Doors	
	Double Pane Glass	R-2.04
	(1/2" air gap)	
	Hollow Metal Door	R-0.60
	Garage Door (Steel/Insul.)	R-5.90
	Total R-Value	R-8.54

Description of Building HVAC

The building office area is heated and ventilated by a central air system. The main air handler is a hot deck / cold deck unit. The unit has pneumatic mixing dampers to adjust the discharge air temp for the individual zones. The mixed air is distributed to local terminal units that are able reheat to satisfy the local thermostat.

The system uses heating water from the central boiler. The boiler is a Crown Freeport model VH-11 hot water boiler. The boiler has a gross output rating of 2,275 MBH with an efficiency of approximately 83%. The system uses chilled water from a central chiller. The central chiller is a TRANE model CGW reciprocating chiller. The condenser water is once through plant water.

The remaining building is ventilated by local roof top exhaust fans and outdoor air added by the central air handler.

The main piping gallery is dehumidified by a Dry-o-tron desiccant dehumidifier and a secondary reheat coil.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.2.4 High Service Pump Station

Description of Building Envelope

The building was constructed in 1966. The building exterior walls are masonry with 4" brick veneer over 8" concrete block. The building foundation is concrete, have of which is above grade and in good condition. The building roof is a black rubber membrane system with tapered insulation over rigid insulation. The roof features six skylights and is in good condition.

The building has no windows. The building aluminum man door is in fair condition.

Existing R-Values:

■ Foundation (above/below grade)	
Int. Air Film	R-0.68
12" Concrete	R-0.96
Ext. Air Film	R-0.17
Total R-Value	R-1.81
■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-2.76
■ Windows and Doors	
Aluminum Man Door	R-0.60

Description of Building HVAC

The building is cooled by outside air. Outside air is introduced through a louver and exhausted by a dedicated fan. The fan is controlled by a line voltage thermostat. The thermostat was set at 85°F.

The building is heated by a Dunkirk Empire II oil-fired hot water boiler. The boiler is an energy star rated with an output capacity of 178 MBH. This boiler has an A.F.U.E of 82.4. The boiler is controlled by a wall thermostat. The thermostat was set at 55°F.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.2.5 Well Houses

The City operates five (5) well houses throughout the water distribution system. The groundwater supply is softened, disinfected and fluoride is added prior to distribution. Well #1 on Barlow Street is treated with sodium hypochlorite and the other four wells are treated with chlorine gas. Well #1 feeds into the gravity line from the plant. Well Nos. 3, 4 or 5 are operated off the water level in the Dewitt Drive Tank, which is the same Hydraulic Grade Line (HGL) of the South Mountain tank. Well #2 is located in a different well field and is the first 'lag' pump after the operation of Well Nos. 3, 4 or 5.

The City of Bristol also maintains an emergency interconnection with City of New Britain. The City of Bristol must purchase 200,000 gallons per year from the City of New Britain to maintain the interconnection.

Description of Building Envelope

#1 Well House – Barlow Street

The building was constructed in 1948. The building exterior walls are masonry with 4" brick veneer over 8" concrete block. The walls do not have any form of insulation or wall cavity. The building foundation is concrete and comes above grade and in good condition. The building roof is a black rubber membrane system with tapered insulation over rigid insulation and in fair condition. The roof features an abandoned access hatch to the roof and in poor condition.

The building has no windows but does feature glass block in the existing window openings and in fair condition. The building's hollow metal door is in fair condition.

■ Existing R-Values: Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-2.76
■ Windows and Doors	
Glass Block	R-1.96
Hollow Metal Door	R-0.60
Total R-Value	R-2.56

#2 Well House – Mechanic Street

The building was constructed in 2002. The building exterior walls are 8" split-face concrete block. Vinyl siding accents the building gable face from the eave to ridge line. The building foundation is slab on grade that comes above grade and in good condition. The building roof is pitched and constructed from wood trusses with asphalt shingles. The roof features a roof or equipment access hatch and water

appears to be seeping in. Rust and water stains are evident on the painted drywall ceiling.

The building has no windows. The building hollow metal door is in good condition.

■ Existing R-Values: Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
Ext. Air Film	R-0.17
Total R-Value	R-1.96
■ Roof	
Asphalt Shingles	R-0.44
Sheathing	R-0.80
Batt Insulation	R-19.0
Total R-Value	R-20.24
■ Windows and Doors	
Hollow Metal Door	R-0.60

#3, #4, and #5 Well Houses – Mix Street

These buildings were constructed in 1965. These buildings are identical in materials and construction.

The building exterior walls are masonry with 4" brick veneer over 8" concrete block. The walls do not have any form of insulation or wall cavity. The building foundation is concrete and in fair condition. The building has no windows but does feature an opening with an insect screen and steel grating. The building galvanized steel doors are in fair condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-2.76
■ Windows and Doors	
Aluminum Man Door	R-0.60

Description of Building HVAC

All the well houses are heated by electric unit heaters with wall thermostats. The thermostats were set to maintain the minimum required space temperature required. Generally these were set at 55°F.

The spaces are cooled by ventilation. The spaces have a dedicated exhaust fan controlled by a line voltage wall thermostat. These thermostats were generally set at 85°F.

Description of Building Lighting

The well house existing lighting systems consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.2.6 Chemical and Control Buildings

Description of Building Envelope

Chemical and Control Building – Mechanic Street

The building was constructed in 1957. The building exterior walls are masonry. The building foundation comes above grade and has a basement level. The foundation is in good condition. The building roof is flat and sloped black rubber membrane system.

The building has no windows. The building's hollow metal doors are in fair condition.

Existing R-Values:

■ Basement (partially below grade)	
Int. Air Film	R-0.68
12" Concrete	R-0.96
Ext. Air Film	R-0.17
Total R-Value	R-1.81
■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
Ext. Air Film	R-0.17
Total R-Value	R-1.96
■ Doors	
Hollow Metal Door	R-0.60

Chemical and Control Building – Mix Street

The building was constructed in 1965. The building exterior walls are constructed from more than one wall system. The exterior walls on one half of the building are masonry with 4" brick veneer over 8" concrete block and the other half is made from solid brick. The building foundation is slab on grade with chemical containment and comes slightly above grade and in poor condition. The building foundation has been weathered and cracked exposing the structural rebar at the perimeter of the

foundation. The foundation has also been damaged by corrosive chemicals that are housed within the building. The building roof is flat and sloped. The flat roof is a black rubber membrane system and the sloped roof is constructed from wood trusses with asphalt shingles with minimal insulation. The sloped roof is in poor condition.

The building windows are wood framed with single pane glass. The building doors are made from aluminum and galvanized steel and in fair condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
4" Brick	R-0.80
4" Brick (12" solid)	R-2.40
Ext. Air Film	R-0.17
Total R-Value	R-5.16
■ Roof	
Asphalt Shingles	R-0.44
Sheathing	R-0.80
■ Windows and Doors	
Single Pane Glass	R-0.91
Hollow Metal Door	R-0.60
Aluminum Man Door	R-0.60
Total R-Value	R-2.11

Description of Building HVAC

The chemical and control buildings are heated by electric unit heaters with wall thermostats. The thermostats were set to maintain the minimum required space temperature required. Generally these were set at 55°F.

The spaces are cooled by ventilation. The spaces have a dedicated exhaust fan controlled by a line voltage wall thermostat. These thermostats were generally set at 85°F.

Description of Building Lighting

The building existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.2.7 Pump and Control Buildings

The City operates three (3) pumping (booster) stations throughout the distribution system. These Booster Stations are operated based upon the associated tank levels. The following table summarizes the characteristics of the pumps.

Table 2.2-2: Booster Pumps						
Pump Station	Associated Tank	No. of Pumps	Capacity (gpm, TDH)	Motor hp	Drive	Hours of Operation
Peck Lane	Old Wolcott Rd Tank	2	700 gpm at 200'	50	Constant Speed	10-12 hours a day
Hill Street	Chapel Hill Tank	3	700 gpm at 260'	60	Constant Speed	10-12 hours a day
Wolcott Street	Witches Rock PS	2	500 gpm at 260' ¹	40	Constant Speed	10-12 hours a day

1. Pump tag wasn't legible, assumed capacity based on horsepower and high head condition.

Description of Building Envelope

Pump and Control Building - Peck Lane

The building was constructed in 2001. The building exterior walls are 8" concrete block with vinyl siding. The building foundation is concrete and in good condition. The building roof is pitched and constructed from wood trusses and asphalt shingles with no insulation. The roof has several skylights and in good condition.

The building windows are single pane. The building hollow metal doors are in good condition.

Existing R-Values:

- Structure (above grade)
 - Int. Air Film R-0.68
 - 8" CMU R-1.11
 - Vinyl Siding R-0.61
 - Ext. Air Film R-0.17
 - Total R-Value R-2.57
- Roof
 - Asphalt Shingles R-0.44
 - Sheathing R-0.80
 - Total R-Value R-1.24
- Windows and Doors

Single Pane Glass R-0.91

Pump and Control Building – Hill Street

The building was constructed in 1966. The building exterior walls are masonry with 4" brick veneer over 8" concrete block. The building foundation is concrete and has a basement level. The foundation is in good condition. The building roof is a black rubber membrane stone ballasted roof system with tapered insulation over rigid insulation. The roof features four skylights and in good condition.

The building has no windows. The building aluminum door is in good condition.

Existing R-Values:

■ Basement (below grade)	
Int. Air Film	R-0.68
12" Concrete	R-0.96
Ext. Air Film	R-0.17
Total R-Value	R-1.81
■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-2.76
■ Windows and Doors	
Aluminum Man Door	R-0.60

Pump and Control Building – Wolcott Street

The building was constructed in 2006. The building exterior walls are 4" of precast concrete with wood studs, sheathing and vinyl siding, intermediate insulation between the studs is unknown. The building foundation is concrete and in good condition. The building roof is pitched and constructed from wood trusses and asphalt shingles with no insulation.

The building windows are vinyl framed with double pane glass. The building hollow metal doors are in good condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
4" Precast Concrete	R-0.81
Wall Cavity	R-1.00
Rigid Insulation	R-7.50
Sheathing	R-0.80

	Vinyl Siding	R-0.61
	Ext. Air Film	R-0.17
	Total R-Value	R-11.57
■	Roof	
	Asphalt Shingles	R-0.44
	Sheathing	R-0.80
	Total R-Value	R-1.24
■	Windows and Doors	
	Double Pane Glass	R-2.04
	(1/2" air gap)	
	Hollow Metal Door	R-0.60
	Total R-Value	R-2.64

Description of Building HVAC

The Pump and Control Buildings are heated by electric unit heaters with wall thermostats. The thermostats were set to maintain the minimum required space temperature required. Generally these were set at 55°F.

The spaces are cooled by ventilation. The spaces have a dedicated exhaust fan controlled by a line voltage wall thermostat. These thermostats were generally set at 85°F.

Description of Building Lighting

The building existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.2.8 Generator Buildings

Description of Building Envelope

Generator Building – Mix and Hill Street

The building was constructed in 1999. The building exterior walls are 4" precast concrete. The building foundation is concrete and in good condition. The building roof is sloped concrete.

The building has no windows. The building hollow metal door is in good condition.

Existing R-Values:

■	Structure (above grade)	
	Int. Air Film	R-0.68
	4" Precast Concrete	R-0.81
	Ext. Air Film	R-0.17

	Total R-Value	R-1.66
■ Roof	Sloped Concrete	R-1.22
■ Windows and Doors	Hollow Metal Door	R-0.60

Description of Building HVAC

Mix Street is heated by electric unit heaters with wall thermostats. The thermostats were set to maintain the minimum required space temperature required. Generally these were set at 55°F.

Hill Street is heated by a Dunkirk Empire II oil-fired hot water boiler. The boiler is energy star rated with an output capacity of 178 MBH. This boiler has an A.F.U.E of 82.4. The boiler feed hot water to radiators in the various spaces. The boiler maintains temperature. A thermostat controls the circulation pump. The boiler was hot at the time of the site visit.

Both sites are cooled by ventilation. The spaces have a dedicated exhaust fan controlled by a line voltage wall thermostat. These thermostats were generally set at 85°F.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.3 Police Department

2.3.1 Police Court

Description of Building Envelope

The building was constructed in 1979. The building exterior walls are masonry with 4" brick veneer over 8" concrete block and skinned with 2½" of rigid insulation and gypsum wall board at the interior of the exterior walls. The exterior walls are in good condition. The building foundation is concrete. The building foundation has minor damage at the basement garage doors. Overall the foundation is in good condition. The building roof is a parking garage.

The building windows are fixed and operable aluminum framed windows with double pane glass. These windows are at the end of their life expectancy. The building secondary storefront entrances are aluminum framed with single pane glass. The building storefront systems are at the end of their life expectancy. The building garage doors are insulated galvanized steel doors and in poor condition. The garage doors gaskets are cracked, chunked and bent and the door slats are damaged and exposing

their insulation. The garage doors should be replaced. The building hollow metal door at the basement next to the garage doors is in poor condition. This door is starting to rust and should be replaced.

Existing R-Values:

■ Basement (below grade)	
Int. Air Film	R-0.68
12" Concrete	R-0.96
Ext. Air Film	R-0.17
Total R-Value	R-1.81
■ Structure (above grade)	
Int. Air Film	R-0.68
Gypsum Wall Board	R-0.56
Rigid insulation	R-15.60
8" CMU	R-1.11
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-18.92
■ Windows and Doors	
Single Pane Glass	R-0.91
Double Pane Glass	R-2.04
(1/2" air gap)	
Hollow Metal Door	R-0.60
Garage Door (Steel/Insul.)	R-5.90
Total R-Value	R-6.50

Description of Building HVAC

The basement is heated by hot water unit heaters. These unit heaters vary in capacity and are typically controlled by their respective unit mounted controller. Spaces are exhausted by dedicated fans.

The main building is heated and cooled by a central air system. The system uses chilled water from a central chiller. The chiller is a TRANE scroll chiller and is rated for 150 tons. The building is heated by a central steam boiler plant. The HB Smith 350 Mills series boiler has an output capacity of 2,500 MBH. The boiler has an efficiency of approximately 83%. The boiler plant serves perimeter radiation in addition to the heating coils in the central air handlers. The air handlers have 3 way valves on the chilled water coils and 2 way valves on the steam coils. The building also has reheats which use heating hot water. Heating hot water is made by steam to hot water converters in the boiler room during the winter and a hot water boiler in the summer.

The building has electronic controls with electronic actuators. The local spaces have Variable Air Volume (VAV) boxes that regulate air flow from the central air handlers

to maintain space temperature. Many of the central air handlers also have Variable Frequency Drives, or VFD's, which can vary motor speeds. As the VAV boxes reduce the flow to the space, the VFD's reduce the fan speed to maintain system pressure.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.3.2 Parking Garage

Description of Building Envelope

The parking garage was built in 1979. The parking garage exterior walls are made from concrete and makeup the upper two levels and main facade of the police department. The first level of the parking garage is somewhat enclosed with louvers spanning between the supporting concrete columns. The second level is not enclosed. The main feature of the police department are two cylindrical access ramps to the parking garage with the main stairwell of the facility protruding between the two ramps. The ramps and main stairwell start at the ground floor and end at the second level of the parking garage. There are two common stairwells that are made from solid brick starting at the ground floor and ending at the second level of the parking garage. These common stairwells show signs of water infiltration at the exit doors on the first and second levels of the parking garage. The stairs are rusting and water stains have accumulated down the walls. The parking garage foundation at the access ramps and main stairwell are made from concrete and in good condition. The parking garage roof is concrete and non-insulated.

The main stairwell windows are aluminum framed with double pane glass. These windows are at the end of their life expectancy. The main stairwell storefront doors are aluminum framed with single pane glass. These door are at the end of their life expectancy. The parking garage hollow metal doors are in fair to good condition.

Existing R-Values:

R values are not applicable to parking structure. Parking structure is open to the elements.

Description of Building HVAC

The garage is not heated or mechanically ventilated. The stairwells serving the parking garage are heated by 2 electric cabinet heaters and 2 hot water cabinet heaters. The electric cabinet heaters are rated at approximately 10 kW.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.4 Parks and Recreation

2.4.1 Rockwell Park Service Building

Description of Building Envelope

The building was constructed in 1950. The building exterior walls are masonry with stone veneer. The building foundation is made concrete and in good condition. The building roof is pitched with dormers and constructed from wood trusses and asphalt shingles with no insulation.

The building windows are steel framed with single pane glass and in fair condition. The building garage doors are insulated galvanized steel and in good condition. The building hollow metal doors and frames are in fair to poor condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
Stone Veneer	R-0.30
Ext. Air Film	R-0.17
Total R-Value	R-2.26
■ Roof	
Asphalt Shingles	R-0.44
Sheathing	R-0.34
Total R-Value	R-0.78
■ Windows and Doors	
Single Pane Glass	R-0.91
Hollow Metal Door	R-0.60
Garage Door (Steel/Insul.)	R-5.90
Total R-Value	R-7.41

Description of Building HVAC

The building is heated by a central hot water boiler. The boiler is a Burnham cast iron sectional oil fired boiler rated at an output capacity of 127 MBH. The spaces are heated by wall mounted radiators. The heating is controlled by local thermostats.

The building is locally cooled by window air conditioners. The office, carpenter shop and locker room all had air conditioners installed at the time of the site visit. The cooling is controlled by the unit mounted controls.

The bathroom is ventilated by a switch operated exhaust fan. The domestic hot water is made by an electric water heater.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.4.2 Rockwell Pavilion

Description of Building Envelope

The building was constructed in 1963. The building exterior walls are constructed from wood with intermediate stone columns. The building foundation is concrete and in good condition. The building roof is pitched and constructed from wooded beams and asphalt shingles with no insulation. The roof has vaulted ceiling with wood planks that are secured to roof.

The building windows are wood framed with single pane glass and in fair condition. The building hollow metal doors are in fair condition.

■ Existing R-Values: Structure (above grade)	
Int. Air Film	R-0.68
Hardwood Paneling	R-0.80
Wall Cavity	R-1.00
Hardwood Siding	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-3.15
■ Roof	
Asphalt Shingles	R-0.44
Sheathing	R-0.80
Total R-Value	R-1.24
■ Windows and Doors	
Single Pane Glass	R-0.91
Hollow Metal Door	R-0.60
Total R-Value	R-1.51

Description of Building HVAC

The Rockwell Pavilion is heated by 2 oil fired forced air furnaces . These furnaces are controlled by wall mounted thermostats in the spaces they serve. They have input capacities of 164 MBH and 108 MBH.

The domestic hot water is made by an electric water heater.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.4.3 Bathhouse

Description of Building Envelope

The building was constructed in 1921. The building exterior walls are stone and mortar and in good condition. The upper part of the building is constructed from stud walls with vinyl siding which supports the roof. The building foundation is concrete and in good condition. The building roof is pitched and constructed from wood trusses and asphalt shingles with no insulation. The roof eaves and gables have vented soffits.

The building windows are wood framed with single pane windows and in fair condition. The building concession window metal rollup doors are in fair condition. The building hollow metal doors are in fair condition. The building wooden doors are in fair condition.

Existing R-Values:

■	Basement (half below grade)	
	Int. Air Film	R-0.68
	12" Stone & Mortar	R-0.24
	Ext. Air Film	R-0.17
	Total R-Value	R-1.09
■	Structure (above grade)	
	Int. Air Film	R-0.68
	12" Stone & Mortar	R-0.24
	Ext. Air Film	R-0.17
	Total R-Value	R-1.09
■	Roof	
	Asphalt Shingles	R-0.44
	Sheathing	R-0.80
	Total R-Value	R-1.24
■	Windows and Doors	

Single Pane Glass	R-0.91
Hollow Metal Door	R-0.60
Total R-Value	R-1.51

Description of Building HVAC

The bath house is heated by 2 electric unit heaters. These heaters are rated at 4 kW each.

The building had no cooling installed at the time of the site visit.

The domestic hot water for the building was produced by a 30 gallon electric water heater. All equipment in the building was in poor condition.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.4.4 Muzzy Field

Description of Building Envelope

The building was constructed in 1922. The building exterior walls are masonry with 4" brick veneer over 8" concrete block. The building foundation is concrete and in good condition. The building roof at the visitor's grandstand is concrete and in good condition. The building roof at the home team's grandstand is white rubber membrane system with no insulation and in good condition.

The announcer's box is made from solid brick with a hollow metal door and several aluminum framed single pane glass windows, all in good condition. The roof features a fenced-in wooded deck.

The building windows are steel framed with single pane glass and in fair condition. The building garage doors are in fair condition. The building hollow metal doors are in fair to good condition.

Existing R-Values:

- Structure (above grade)

Int. Air Film	R-0.68
8" CMU	R-1.11
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-2.76
- Structure (above grade announcer)

Int. Air Film	R-0.68
4" Brick (12" solid)	R-2.40
Ext. Air Film	R-0.17
Total R-Value	R-3.25
Windows and Doors	
Single Pane Glass	R-0.91
Hollow Metal Door	R-0.60
Garage Door (Steel)	R-0.60
Total R-Value	R-2.11

Description of Building HVAC

The locker rooms are heated by gas fired unit heaters. The storage spaces are heated by electric unit heaters. The press box is heated and cooled by a packaged through-the-wall air conditioner with an electric resistance heating element.

The building is set to maintain temperature above freezing in all storage closets. The unit heaters in the locker rooms are set higher when they are occupied and the space requires heating.

Bathrooms are ventilated by switch operated exhaust fans and windows.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.4.5 Ski Lodge

Description of Building Envelope

The building was constructed in 1960. The building exterior walls are made from wood studs, wood sheathing and wood paneling. The building foundation is concrete and in good condition. The building roof is pitched and constructed from wood trusses and asphalt shingles with no insulation.

The building windows are wood framed with single pane glass and in fair condition. The building doors are aluminum framed with single pane glass and in fair condition. The building has one residential metal door and in good condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
Hardwood Paneling	R-0.80
Wall Cavity	R-1.00

	Hardwood Paneling	R-0.80
	Ext. Air Film	R-0.17
	Total R-Value	R-3.45
■	Roof	
	Asphalt Shingles	R-0.44
	Sheathing	R-0.80
	Total R-Value	R-1.24
■	Windows and Doors	
	Single Pane Glass	R-0.91

Description of Building HVAC

The ski lodge is heated by an electric unit heater. The space can also be heated by a wood stove.

The building had no cooling system installed at the time of the site visit.

The building restrooms are ventilated by switch operated exhaust fans.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.4.6 Page Park Pavilion

Description of Building Envelope

The building was constructed in 1963. The building exterior walls are made from wood studs, wood sheathing and wood paneling. The building foundation is concrete and in good condition. The building roof is pitched and constructed from wood trusses with a non-insulated standing seam metal panel. The roof gables have vented soffits.

The building windows are wood framed with single pane glass and in fair condition. The building hollow metal doors are in fair condition.

Existing R-Values:

■	Structure (above grade)	
	Int. Air Film	R-0.68
	Hardwood Paneling	R-0.80
	Wall Cavity	R-1.00
	Hardwood Paneling	R-0.80
	Ext. Air Film	R-0.17
	Total R-Value	R-3.45

■ Roof		
	Asphalt Shingles	R-0.44
	Sheathing	R-0.80
	Total R-Value	R-1.24
■ Windows and Doors		
	Single Pane Glass	R-0.91
	Hollow Metal Door	R-0.60
	Total R-Value	R-1.51

Description of Building HVAC

The Page Park Pavilion is heated by a Weil McLain cast iron hot water boiler. The boiler is oil fired and rated at 480 MBH. The space is heated by hot water baseboard radiators. The boiler is controlled by a thermostat in the space.

The building's domestic hot water is made by a 20 gallon electric water heater.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.4.7 Recreation Building

Description of Building Envelope

The building was constructed in 1955. The building exterior walls are stone and mortar. The building foundation is concrete and in fair condition. The building roof is pitched and constructed from wood trusses and asphalt shingles with no insulation. The roof gables are constructed from wood studs, sheathing and siding.

The building windows are wood frame with single pane glass and in good condition. The windows have wooden storm shutters and in good condition. The building garage doors are wood and in good condition. The building hollow metal doors are in fair condition. The building wooden doors are in fair condition.

Existing R-Values:

■ Structure (above grade)		
	Int. Air Film	R-0.68
	12" Stone & Mortar	R-0.24
	Ext. Air Film	R-0.17
	Total R-Value	R-1.09
■ Roof		
	Asphalt Shingles	R-0.44
	Sheathing	R-0.80
	Total R-Value	R-1.24

■ Windows and Doors	
Single Pane Glass	R-0.91
Wood Shutters	R-1.00
Wood Door	R-3.00
Total R-Value	R-4.91

Description of Building HVAC

The building is heated by 2 gas fired unit heaters. The unit heaters are pilot light ignition and the pilots were lit at the time of the site visit. The units maintain space temperature by the controls on the units.

No cooling system was installed at the time of the site visit.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.5 Fire Department

2.5.1 Fire Department Headquarters

Description of Building Envelope

The building was constructed in 1963. The building exterior walls are solid brick but later additions to the building are masonry with 4" brick veneer over 8" concrete block. There is minor cracking at the interior brick walls. The building foundation is concrete and in good condition. The building roof is a black rubber membrane system.

The building windows are aluminum framed, some operable, with single and double pane glass. These windows are extremely drafty per the buildings occupants. The building main and secondary storefront entrances are aluminum frames with single pane glass. These storefronts are extremely drafty per the buildings occupants. The building garage doors are insulated sectional doors with metal framed glass transoms and in good condition. The building hollow metal doors are in fair condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
4" Brick (12" solid)	R-2.40
Ext. Air Film	R-0.17
Total R-Value	R-3.25
■ Windows and Doors	
Single Pane Glass	R-0.91

Double Pane Glass (1/2" air gap)	R-2.04
Hollow Metal Door	R-0.60
Garage Door (Steel/Insul.)	R-5.90
Total R-Value	R-9.45

Description of Building HVAC

The building is heated by an AO Smith central cast iron hot water boiler. The boiler has a capacity of 1,137 MBH and makes hot water for the perimeter radiation in offices and living areas and unit heaters in the bays.

The 2nd floor is cooled by a direct expansion (DX) split system. The system has a roof mounted condenser and interior air handler. The attached offices were served by individual window units.

The building was zoned by area use. The thermostats were not typically programmable due to the building's continuous occupancy. The boiler is only controlled by the onboard aquastat. At the time of the site visit the boiler was observed to be on.

The firehouse has the capability to produce service hot water using either an electric water heater or the space heating boiler. The space heating boiler serves an indirect heat exchanger to produce service hot water. At the time of the site visit the Fire HQ was using the electric water heaters for service water heating.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.5.2 Engine Companies

Description of Building Envelope

Engine Company 2 Fire Station

The building was constructed in 1968. The building exterior walls are masonry with 4" brick veneer over 8" concrete block. The building foundation is concrete and in good condition. The building roof is pitched with an insulated white rubber membrane system and in good condition.

The building windows and storefronts are aluminum framed with double pane glass. These windows and storefronts are extremely drafty per the buildings occupants. The building garage doors are insulated sectional doors and in good condition. The building hollow metal doors are in good condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-2.76
■ Windows and Doors	
Double Pane Glass	R-2.04
(1/2" air gap)	
Hollow Metal Door	R-0.60
Garage Door (Steel/Insul.)	R-5.90
Total R-Value	R-8.54

Engine Companies 3, 4, and 5 Fire Stations

These buildings were constructed in the early to mid '60s. These three buildings are identical in construction. The building exterior walls are masonry with 4" brick veneer over 8" concrete block. The building foundation is concrete and in good condition. The building roof is a black rubber membrane system and in good condition.

The building windows and storefronts are aluminum framed with double pane glass. These windows and storefronts are extremely drafty per the buildings occupants. The building garage doors are insulated sectional doors and in good condition. The building hollow metal doors are in fair condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-2.76
■ Windows and Doors	
Double Pane Glass	R-2.04
(1/2" air gap)	
Hollow Metal Door	R-0.60
Garage Door (Steel/Insul.)	R-5.90
Total R-Value	R-8.54

Description of Building HVAC

The Engine buildings are heated by central hot water boilers. Engine 2 has an oil fired, HB Smith boiler 25 Mills series. The boiler has a capacity of 707 MBH. Engine 3

has a gas fired Weil McLain boiler. This boiler has a gross output capacity of 160 MBH. Engine 4 has an oil fired Weil McLain boiler. This boiler has a capacity of 707 MBH. Engine 5 has an oil fired HB Smith 19 Series boiler. This boiler has a gross output capacity of 460 MBH. The boilers make hot water for the perimeter radiation in offices and living areas and unit heaters in the bays.

The living areas were cooled by individual window units.

The building was zoned by area use. The thermostats were not typically programmable due to the building's continuous occupancy. The boiler is only controlled by the onboard aquastat. At the time of the site visit, all except for one of the boilers were observed to on.

Each site had the capability to produce service hot water using either an electric water heater or the space heating boiler. The space heating boilers were not observed to have a potable water heat exchanger. At the time of the site visit all fire houses were using the electric water heaters for service water heating.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.6 Senior Center

2.6.1 Senior Center

Description of Building Envelope

The building was constructed in 1956. The building exterior walls are brick and brick with vinyl siding. The building foundation is concrete and in good condition. The building roof is flat and pitched. The pitched roof is constructed from wood trusses with 11 year old asphalt shingles and insulation and in good condition. Some shingles are missing or degraded where the roof transitions from pitched to flat. The flat roof is a 15 years old black rubber membrane system and in good condition. Water pools and does not drain efficiently around the mechanical units on the flat roof. The building brick chimney is cracked and the mortar is degraded.

The building windows are wood and vinyl framed casement windows with double pane glass. The building hollow metal doors are in fair to poor condition.

Existing R-Values:

- Structure (above grade)
Int. Air Film R-0.68

4" Brick (12" solid)	R-2.40
Vinyl Siding	R-0.61
Ext. Air Film	R-0.17
Total R-Value	R-3.86
■ Pitched Roof	
Asphalt Shingles	R-0.44
Sheathing	R-0.80
Batt Insulation	R-19.0
Total R-Value	R-20.24
■ Flat Roof	
Black EPDM/Insul.	R-20.00*
■ Windows and Doors	
Double Pane Glass (1/2" air gap)	R-2.04
Hollow Metal Door	R-0.60
Total R-Value	R-2.64

*Existing roof R-Value was estimated assuming 4" of rigid insulation at R-5 per 1".

Description of Building HVAC

The building is heated by a central boiler plant. The boiler plant is comprised of a Weil McLain gas fired boiler rated at 3,000 MBH. This boiler has an efficiency of 80%. The zones are heated by perimeter radiation.

The building is cooled by multiple DX systems. The class rooms and medical areas are served by split systems. The cafeteria, gymnasium and other various areas are served by packaged roof top units.

The boiler is controlled by an outdoor temperature reset and shutdown. The thermostats observed were programmable.

The kitchen has a dedicated exhaust fan. The site staff reported that the fan is not rated for grease. The fan is a single speed roof mounted exhaust fan controlled by a switch in the kitchen.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.7 Libraries

2.7.1 Main Library

Description of Building Envelope

The building was constructed in 1907 with a recent renovation in 2006. The building exterior walls of the first floor are solid brick with a finished interior. The building exterior walls of the second floor are metal studs with insulation with sheathing and decorative solid exterior wood paneling. The building foundation is concrete and in good condition. The pitched roof is constructed from wood trusses with asphalt shingles and insulation and in good condition. The flat roof is a black rubber membrane system with insulation and in good condition.

The building windows are wood and vinyl framed fixed and double hung windows with double pane glass. The building garage door is insulated and in good condition. The building hollow metal doors are in good condition.

Existing R-Values:

■	Basement (below grade)	
	Int. Air Film	R-0.68
	12" Concrete	R-0.96
	Ext. Air Film	R-0.17
	Total R-Value	R-1.81
■	Structure (above grade 1 st Floor)	
	Int. Air Film	R-0.68
	Gypsum Wall Board	R-0.56
	Wall Cavity	R-1.00
	Rigid Insulation	R-7.50
	4" Brick (12" solid)	R-2.40
	Ext. Air Film	R-0.17
	Total R-Value	R-12.31
■	Structure (above grade 2 nd Floor)	
	Int. Air Film	R-0.68
	Gypsum Wall Board	R-0.56
	Wall Cavity	R-1.00
	Batt Insulation	R-19.00
	4" Brick (12" solid)	R-2.40
	Ext. Air Film	R-0.17
	Total R-Value	R-23.81
■	Pitched Roof	
	Asphalt Shingles	R-0.44
	Sheathing	R-0.80
	Batt Insulation	R-19.00
	Total R-Value	R-20.24
■	Flat Roof	
	Black EPDM/Insul.	R-20.00*

■ Windows and Doors	
Single Pane Glass	R-0.91
Double Pane Glass (1/4" air gap)	R-1.69
Hollow Metal Door	R-0.60
Garage Door (Steel/Insul.)	R-5.90
Total R-Value	R-9.10

*Existing roof R-Value was estimated assuming 4" of rigid insulation at R-5 per 1".

Description of Building HVAC

The main library HVAC systems were recently upgraded. The building heating is provided by two HB Smith central boilers. The boilers each have input ratings of 1,770 MBH and provide hot water to the central air handlers and 4 pipe terminal units. The central air handlers also had energy recovery ventilators.

Cooling is provided by a central chiller. The chiller has a built in evaporative condenser. The chiller is a scroll compressor and the chilled water is pumped to the central air handlers and the 4 pipe terminal units.

The building is controlled by a central control system. The main terminal is located in the maintenance office. The control system uses local thermostats to control the terminal units and regulate the discharge air temperature of the central air handlers.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.7.2 Public Library

Description of Building Envelope

The building was constructed in 1976. The building exterior walls are masonry. The building foundation is concrete and in good condition. The building roof is pitched and constructed from wood trusses with asphalt shingles over insulated fiberglass board. The ceiling has water stains; this is a good indicator that the roof leaks.

The building windows are aluminum framed with double pane glass. The building storefront entrances are aluminum framed with single pane glass. The building hollow metal doors are in good condition.

Existing R-Values:

- Basement (half below grade)

	Int. Air Film	R-0.68
	8" CMU	R-1.11
	Ext. Air Film	R-0.17
	Total R-Value	R-1.96
■	Structure (above grade)	
	Int. Air Film	R-0.68
	8" CMU	R-1.11
	Ext. Air Film	R-0.17
	Total R-Value	R-1.96
■	Roof	
	Asphalt Shingles	R-0.44
	Sheathing	R-0.80
	Fiberglass Board	R-.044
	Total R-Value	R-1.68
■	Windows and Doors	
	Double Pane Glass	R-2.04
	Hollow Metal Door	R-0.60
	Total R-Value	R2.64

Description of Building HVAC

The public library is heated by a gas fired HB Smith boiler. The boiler has a capacity of 450 MBH with an efficiency of 81.5%. The hot water serves the hot water coils in the two air handling units.

The building is cooled by an outdoor air cooled chiller. The chiller provides chilled water to the central air handlers for the first floor and basement.

The building is controlled by local controllers which control the heating and cooling valves on the central air handlers. The building is on a digital control system but does not have a local terminal. Therefore, the building has to call another building to adjust setpoints, and control their units.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.8 Youth Services

2.8.1 Main Building

Description of Building Envelope

The building was constructed in 1900. The building exterior walls of the Victorian house are made of all wood construction. The building exterior walls of the addition

are made of all solid brick construction. The building foundation is concrete and in good condition. The building roof of the Victorian house is pitched and constructed from wood trusses with asphalt shingles with no insulation. The building roof, for the addition, is flat with a black rubber membrane system.

The building windows are wood framed casement window with single pane glass with exterior storms. The windows of the Victorian house are original and extremely drafty. The building doors are wood with double pane glass and in good condition.

Existing R-Values:

■ Basement (below grade)	
Int. Air Film	R-0.68
12" Concrete	R-0.96
Ext. Air Film	R-0.17
Total R-Value	R-1.81
■ Structure (above grade Victorian)	
Int. Air Film	R-0.68
Gypsum Wall Board	R-0.56
Batt Insulation	R-5.50
Hardwood Siding	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-7.41
■ Structure (above grade Addition)	
Int. Air Film	R-0.68
Gypsum Wall Board	R-0.56
Batt Insulation	R-5.50
4" Brick (12" solid)	R-2.40
Ext. Air Film	R-0.17
Total R-Value	R-9.31
■ Pitched Roof	
Asphalt Shingles	R-0.44
Sheathing	R-0.80
Total R-Value	R-1.24
■ Flat Roof	
Black EPDM/Insul.	R-20.00*
■ Windows and Doors	
Single Pane Glass	R-0.91
Double Pane Glass	R-2.04
Storms	R-2.00
(1/2" air gap)	
Wood Door	R-0.60
Total R-Value	R-5.55

*Existing roof R-Value was estimated assuming 4" of rigid insulation at R-5 per 1".

Description of Building HVAC

The building is heated by First Company forced hot air furnaces. These furnaces are natural gas fired and rated at 91MBH and 33MBH. Each furnace is controlled by a local thermostat within the area served by the furnace.

The furnaces also provide cooling through a split system. The condensers are located outside the building and are connected to the evaporator in the furnaces.

The programmable thermostats control the heating, cooling and set back of the building heating system.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.9 Public Works Department

2.9.1 Animal Control

Description of Building Envelope

The building was constructed in 1978. The building exterior walls are masonry. The building foundation is concrete and in good condition. The building roof is pitched and constructed from wood trusses and asphalt shingles with insulation.

The building windows are vinyl double hung windows with single pane glass. The building hollow metal doors are in fair condition.

Existing R-Values:

- Structure (above grade)

Int. Air Film	R-0.68
6" CMU	R-0.96
Ext. Air Film	R-0.17
Total R-Value	R-1.96
- Structure (office area above grade)

Int. Air Film	R-0.68
Gypsum Wall Board	R-0.56
Batt Insulation	R-5.00
6" CMU	R-0.96
Vinyl Siding	R-0.61
Ext. Air Film	R-0.17
Total R-Value	R-7.98
- Roof

Asphalt Shingles	R-0.44
Sheathing	R-0.80
Batt Insulation	R-19.00
Total R-Value	R-20.24
■ Windows and Doors	
Single Pane Glass	R-0.91
Hollow Metal Door	R-0.60
Total R-Value	R-1.51

Description of Building HVAC

The building office is heated by a condensing hot air furnace. The Comfort Aire furnace has an efficiency of 93.5% AFUE. The kennel areas are heated by natural gas fired unit heaters. These Carrier unit heaters are rated at 60 MBH output capacity each. The office area is maintained at 65 °F while the kennel area is kept at 55°F. All heating appliances are controlled by local thermostats.

The office is cooled by a portable air conditioner discharged heat out a window.

The building is heated to the lowest temperatures allowed by the regulating authority. The building is exhausted continuously for ventilation and cooling in the summer.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.9.2 Community Services

Description of Building Envelope

The building was constructed in 1959. The building exterior walls are masonry. The building foundation is concrete and in fair condition. The building roof is pitched and constructed from wood trusses and asphalt shingles with no insulation.

The building windows are sliding vinyl framed windows with single pane glass and in fair condition. The building garage doors are insulated and in fair condition. The building hollow metal door is in fair condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
Ext. Air Film	R-0.17

	Total R-Value	R-1.96
■ Roof		
	Asphalt Shingles	R-0.44
	Sheathing	R-0.80
	Total R-Value	R-1.24
■ Windows and Doors		
	Single Pane Glass	R-0.91
	Hollow Metal Door	R-0.60
	Garage Door (Steel/Insul.)	R-5.90
	Total R-Value	R-7.41

Description of Building HVAC

No heating, cooling or ventilation equipment was observed. The building appeared to be unconditioned.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.9.3 Hill Street

Description of Building Envelope

The building was constructed in 1920. The building exterior walls are solid brick. The building foundation is concrete and in fair condition. The building roof is pitched and constructed from wood trusses with slate shingles and no insulation. The shingles are coming loose and breaking. The shingles should be replaced.

The building windows are vinyl framed casement windows with double pane glass. The building wood doors are in fair condition.

Existing R-Values:

■ Basement (half below grade)		
	Int. Air Film	R-0.68
	12" Concrete	R-0.96
	Ext. Air Film	R-0.17
	Total R-Value	R-1.96
■ Structure (above grade)		
	Int. Air Film	R-0.68
	4" Brick (12" solid)	R-2.40
	Ext. Air Film	R-0.17
	Total R-Value	R-3.25
■ Roof		

Slate Shingles	R-0.05
Sheathing	R-0.80
Total R-Value	R-0.85

■ Windows and Doors

Double Pane Glass (1/4" air gap)	R-1.69
Wood Door	R-3.00
Total R-Value	R-4.69

Description of Building HVAC

The building is heated by a central HB Smith boiler oil fired boiler. The boiler has an input capacity of 309 MBH. The steam is distributed through a 2 pipe system to 1 pipe radiators. No thermostats were observed.

The site has window air conditioners stored in the building. It does not appear that the units are ever installed and used to cool the space.

The building appears to be used as cold storage. The building has no computerized control system.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.9.4 City Yard

Description of Building Envelope

The building was constructed in 1970. The garage and administration facility exterior walls are masonry with 4" brick veneer over 8" concrete block with a 3' high concrete knee wall. Large openings of the building are in filled with wood construction and plywood sheathing that is badly weathered. The grout of the brick is becoming badly deteriorated. A recent addition of a maintenance garage is a pre-engineered building with a 2" insulated metal wall panel. The building foundations is concrete and in good condition. Both buildings have a flat roof with a black rubber membrane system.

The administration facility windows are vinyl framed casement windows with double pane glass and in fair condition. The garage windows are steel framed with single pane glass at the garage area and in fair to poor condition. The garage doors are insulated sectional doors and in fair condition. The maintenance garage doors are insulated sectional doors and in good condition. The building hollow metal doors are in fair to poor condition.

Existing R-Values:

■ Structure (above grade garage/admin)	
Int. Air Film	R-0.68
8" CMU	R-1.11
4" Brick	R-0.80
Plywood	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-3.56
■ Structure (above grade maintenance)	
Int. Air Film	R-0.68
2" Insulated Metal Panel	R-16.00
Ext. Air Film	R-0.17
Total R-Value	R-16.85
■ Windows and Doors	
Single Pane Glass	R-0.91
Double Pane Glass	R-2.04
(1/2" air gap)	
Hollow Metal Door	R-0.60
Garage Door (Steel/Insul.)	R-5.90
Total R-Value	R-9.45

Description of Building HVAC

The office areas are heated by electric baseboard radiators. The garage is heated by Reznor and Modine natural gas unit heaters. The bay is heated by 3 unit heaters. Two unit heaters are oil fired. The remaining unit heater is a natural gas fired condensing unit heater.

The office areas are cooled by window air conditioners. The Goldstar and Carrier units vary in size and age.

The building has dedicated exhaust fans for the bay, bathrooms, locker rooms and shop. Domestic hot water is made by an electric water heater located in the locker room.

The bay unit heaters are controlled by onboard unit controls. The offices are controlled by thermostats on the individual heaters and window air conditioners.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.9.5 Transfer Stations

Description of Building Envelope

These building were constructed in 2004. The building exterior walls for the scale house are 8" concrete block. The building exterior walls for the office are constructed from wood studs, exterior sheathing, wood paneling, gypsum and in filled with batt insulation. The Quonset hut is a pre-engineered building with corrugated metal panel and poly-wrapped batt insulation. The insulation in damaged and torn and a liner panel should be installed to protect the insulation from being damaged. The building foundation is concrete and in good condition. The building roof for the scale house and office is pitched and constructed from wood trusses and asphalt shingles with insulation.

The transfer station office windows are double pane with vinyl frames. The office exterior doors are insulated half light doors.

Existing R-Values:

- Structure (above grade scale house)

Int. Air Film	R-0.68
8" CMU	R-1.11
Ext. Air Film	R-0.17
Total R-Value	R-1.96
- Structure (above grade office)

Int. Air Film	R-0.68
Gypsum Wall Board	R-0.56
Wall Cavity	R-1.00
Batt Insulation	R-12.67
Sheathing	R-0.80
Wood Paneling	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-16.68
- Structure and Roof (above grade Quonset hut)

Int. Air Film	R-0.68
Metal Panel	Negligible
Batt Insulation	R-16.00
Total R-Value	R-16.68
- Roof (scale house and office)

Asphalt Shingles	R-0.44
Sheathing	R-0.80
Batt Insulation	R-19.00
Total R-Value	R-20.24
- Windows and Doors (scale house and office)

Double Pane Glass	R-2.04
(1/2" air gap)	
Hollow Metal Door	R-0.60

Total R-Value	R-2.64
■ Doors (Quonset hut)	
Garage Door (Steel/Insul.)	R-5.90

Description of Building HVAC

The Transfer station offices are heated and cooled by 2 Packaged Terminal Air Conditioners, or PTAC's. These units are rated at 15,100 btu/hr heating and cooling. The units are controlled by the onboard controller.

The transfer station Quonset hut is heated by a waste oil unit heater. The unit heater is controlled by a wall mounted thermostat. The Quonset hut has no cooling.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.10 Water Pollution Control

The City of Bristol owns and operates a water pollution control facility, 14 pumping stations, 230 miles of sewers lines and 5,650 manholes. The pumping stations include:

- Boivin St PS
- Broad St PS
- Cherry Hill PS
- Cross St PS
- Drayla PS
- E Main St PS
- Ivy Dr PS
- Julia Rd PS
- Lake Ave PS
- Lufkin PS
- Matthews St PS
- Middle St PS
- Minor Rd PS
- Tyler PS

The City of Bristol's Water Pollution Control Facility (WPCF) is an advanced wastewater treatment plant with an average capacity of 8 MGD, design capacity of 10.75 MGD, and peak capacity of 33 MGD. The effluent from the facility discharges to the Pequabuck River, which flows to the Farmington River, which flows to the Long Island Sound. The last major upgrade of the facility was in 1987.

Treatment includes screening, grit removal, primary settling, aeration, nitrification, denitrification, final settling and ultraviolet (UV) disinfection. The waste activated sludge (WAS) and primary sludge is co-thickened in the primary clarifiers then pumped to thickened sludge storage tanks, from which the sludge is then sent to belt filter presses for dewatering prior to hauling to an off-site incinerator.

Headworks

The Headworks area of the Bristol WPCF consists of a coarse bar rack with 6-inch openings to protect the downstream processes, (2) mechanically cleaned and two (2) automatically cleaned bar screens, and two Vortex grit removal and grit washing units. There is also a bypass with no screening. The automatic bar screens are on timers that operate for 2 minutes every 15 minutes. There are plans to automate the grit removal system. Scum from the primary and secondary clarifiers is collected in scum wells equipped with mechanic mixers and grinders. Scum is pumped to a rotary strainer in the Headworks Building, the screenings from which are deposited into a container for offsite disposal.

The primary and secondary scum pumps have recently been replaced with more efficient units and the scum system is automated. The facility receives approximately 10,000 gallons of septage per month and the septage is discharged to the Headworks facility. Odor control has been an ongoing concern at the Headworks facility. Many odor control measures have been installed and an odor study is currently underway. Based on the reported operation of the existing Headworks systems and the fact that this technology has not changed, there is no energy conservation measures recommended for these systems.

Primary Sedimentation

The wastewater flows by gravity and is split equally to three circular primary clarifiers, each 70 foot in diameter with a 12-foot side water depth. Typically, two operate in the summer; however, three operate when there are heavy rains. Each primary clarifier is equipped with mechanical sludge and scum removal mechanisms. There are four plunger pumps for the primary sludge and two plunger pumps for the primary scum. Due to the reported operation of the sludge and scum collection equipment, that the system is a low energy system and that there are no advances in the technology, there are no energy conservation measures recommended for this system.

Pump Station

Primary effluent and return activated sludge (RAS) are lifted to the aeration basins. The City installed one 100 hp (13 MGD) submersible pump with VFD in 2009 and is currently installing a second submersible pump (150 hp) to lift the primary effluent and RAS. Prior to the installation of these submersible pumps, the primary effluent was lifted by three (3) 75 hp screw lift pumps with a fourth screw pump dedicated to the RAS. Each screw pump has an 11 MGD capacity and three had VFDs.

Submersible pumps were selected by the City to replace the use of the screw pumps as the primary conveyance method, due to the age and maintenance requirements of the screw pumps. The screw pump station will be left operable to supplement the submersible pump station as needed. During the day the one submersible pump runs full out lifting 8 MGD of wastewater flow plus the 5 to 6 MGD of RAS. At night the pump is turned down to 78% speed. The installation of the new submersible pumps with VFDs will allow for improved process and energy efficiency.

Aeration System

The aeration tanks are operated as two parallel trains. The first tank is baffled and flow through the second and third tanks is directed through slide gates, creating a serpentine flow pattern across the aeration train. The first tank of each train is maintained at an oxygen deficit condition (anoxic zones) accepting the internal 30-40% sludge recycle flow. The first tanks are mixed with four (4) 10 hp submersible mixers. The aerated tanks are equipped with ceramic dome fine bubble diffusers. There are two (2) 250 hp multi-stage centrifugal blowers (2,350 scfm) and two (2) 350 hp multi-stage centrifugal blowers (5,840 scfm) that supply the aeration air.

The City has taken steps to upgrade the aeration system to make it more energy efficient by installing VFDS on the two (2) 250 hp blowers and automatic valves on the tank drop legs, creating a 'most open valve' dissolved oxygen (DO) control loop. This is the recommended improvement from an energy standpoint, as dissolved oxygen requirements change continuously based on daily fluctuations in plant flow and loadings. Providing the correct monitoring and control systems for the aeration process is critical, since energy demand increases as the DO demand increases. The installation of a DO control system will automatically control blower output based on oxygen demand and optimize energy usage.

A typical automated DO control system is known as a DO loop. A DO loop control system consists of DO probes in each aeration bay to continuously monitor the DO levels, which are then fed back to the main control panel (MCP). The DO readings from the DO transmitters would be wired to a new PLC which could be connected to a SCADA system for monitoring and DO set point input. A software program in the PLC interprets the readings and sends a signal to the blower VFDs to maintain, increase, or decrease speed, depending on the DO reading when compared to a set DO point or range. The individual DO readings from each bay and measured air flow rates into each diffuser grid will be used to control the inlet air valves of each diffuser grid to maintain the desired DO concentration in each pass automatically. Each diffuser grid drop leg will be provided with one modulating control valve, one thermal dispersion flow meter and one isolation valve.

The 250 hp blowers are automated by dissolved oxygen (DO) feed back to a PLC based control panel. Currently the operators adjust the tank valves to balance the air flow. However, there is a contract in place to complete the automation of the drop leg valves based on DO set points.

Final Sedimentation

Wastewater flows by gravity to the three (3) 110 foot diameter, 13 foot side water depth final clarifiers. Each clarifier is equipped with a slow moving scum and sludge removal mechanism that extends across the diameter of the tank and removes the settled sludge. The waste sludge is pumped to the primary clarifiers for co-thickening. Return sludge is withdrawn and returned to the Plant Pumping Station where it is lifted to the aeration tanks.

UV Disinfection

The Bristol WPCF utilizes ultraviolet (UV) light for final disinfection. The UV system consists of four (4) inline UV disinfection vessels. There are four lamp modules per UV vessel. The system is flow paced with the use of a PLC based control system that bring units on and off line based on the flow rate. One UV unit is designed to treat 8.3 MGD of flow.

The following table, Table 2.10-1, summarizes the original lead/lag operation of the UV disinfection system. Discussions with plant staff indicate that the control of the lamp modules is no longer flow paced, but rather one UV unit is operated in its entirety during the disinfection season (May through October).

Table 2.10-1: Original UV Unit Flow Pacing								
	Lead Unit				1 st Lag, etc.			
Flow (MGD)	Module 1	Module 2	Module 3	Module 4	Module 1	Module 2	Module 3	Module 4
8.33	X	X	X	X				
12.5	X	X	X		X	X	X	
16.6	X	X	X	X	X	X	X	X

Solids Handling

Co-thickened primary and secondary sludge is conveyed to one of two sludge storage tanks. The sludge storage tanks were previously utilized as digesters, built around 1950. In the mid 1980s, the bottoms of the tanks were re-tapered with concrete and retrofitted with coarse bubble diffusers to facilitate the mixing and aerating of the sludge. Each storage tank is 50 feet in diameter. The floor elevation is at 252 feet, high water elevation is approximately 276 feet and the top of the wall is about 280 ft. The co-thickened sludge is currently stored in the thickened sludge storage tank with an operating volume of 122,000 gallons. After storage, the sludge is currently pumped to the belt filter presses in the Dewatering Building prior to trucking off-site for final disposal. The final sludge cake content is typically around 20%. The second sludge

storage tank at the Bristol WPCF is a WAS storage tank with an operating volume of 346,000 gallons. The WAS storage tank was previously used to store WAS before thickening in rotary drum thickeners, but neither the WAS storage tank nor the rotary drum thickeners are currently used.

The co-thickened sludge stored in the thickened sludge storage tank is typically 2 to 4 percent solids. Air is supplied to the coarse bubble diffusers by a premium efficient 40 HP blower with a VFD. Both the blower motor and VFD were recently replaced in order to reduce energy consumption. The operators have indicated the current coarse bubble diffusers and aeration rate barely keep the sludge aerobic at moderate tank elevations. The sludge is typically stored up to 3 days (over long weekends) before being pumped to a belt filter press for dewatering. The Bristol WPCF has to be very sensitive to odors because of its proximity to residential and business neighbors, and a biofilter system has recently been installed for odor control in the sludge storage building.

Plant Water System

The plant water and spray water pumps are located in the Pump House and take their suction from the effluent end of the ultraviolet disinfection facilities. The plant water system at the Bristol WPCF consists of three 255 gpm at 140 TDH ft centrifugal pumps and a hydropneumatic tank. The three pumps are Aurora pumps installed in 1987 and are each 15 HP. The primary uses of plant water are the two belt filter press booster pumps and the screening and grit equipment in the Headworks building. Plant water also serves several yard hydrants adjacent to all facilities for plant maintenance purposes, such as washing clarifiers and the scum system.

There are also three spray water pumps serving the foam control nozzles on the aeration basins, which are independent of the three plant water pumps. The spray water pumps are each 275 gpm at 92 TDH ft centrifugal pumps. They are Aurora pumps installed more recently and are 15 HP each.

Odor Control

The facility uses chemical odor control and biofilters. There are three (3) biofilters each with a 25 hp biofilter blower installed within the last 10 years. The biofilters serve the headworks building, sludge storage tanks and dewatering facility.

2.10.1 Administration Building

Description of Building Envelope

The building was constructed in 1987. The building exterior cavity wall system is constructed from masonry, brick, a 2" air space and rigid insulation with 1-1/2" of rigid insulation and gypsum at the interior of the exterior wall. The building foundation is concrete and in good condition. The building roof is pitched and constructed from wood trusses and asphalt shingles. The ceiling grid has 6" of fiberglass blanket insulation across the ceiling tiles.

The building windows are aluminum framed casement windows with 1" insulated glass. The window sealant is cracking and starting to crumble, recommend resealing windows. The building hollow metal doors are in fair condition but one of the doors has a large rust hole and does not seal properly. Recommend door replacement.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
Wall Cavity	R-1.00
Rigid Insulation	R-6.00
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-9.76
■ Roof	
Asphalt Shingles	R-0.44
Sheathing	R-0.80
Batt Insulation	R-19.00
Total R-Value	R-20.24
■ Windows and Doors	
Double Pane Glass	R-2.04
(1/2" air gap)	
Hollow Metal Door	R-0.60
Total R-Value	R-2.64

Description of Building HVAC

The administration building is heated and cooled by packaged terminal air conditioners, or PTAC's. Heat is generated by an electric resistance coil in the unit. Cooling is provided by the DX coil and air cooled condenser within the unit. The PTAC's are controlled by switches on the units and a wall mounted thermostat.

The building has a central exhaust fan which the occupants used to purge the building. The bathrooms also have switch-operated exhaust fans.

The building occupants presently turn the PTAC's on in the occupied rooms. They turn the units off when they leave. The controls on the individual unit determine if the unit is in heating or cooling and the set point temperature.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing

exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.10.2 Operations Building

Description of Building Envelope

The building was constructed in 1987. The building exterior cavity wall system is constructed from masonry, brick, a 2" air space and rigid insulation. The building foundation is concrete with a basement level and in good condition. The building roof is one year old white thermal plastic olefin (TPO) with rigid insulation and in good condition.

The building windows are aluminum framed casement windows with 1" insulated glass. The window sealant is cracking and starting to crumble, recommend resealing windows. The building hollow metal doors are in fair condition with minor rusting.

Existing R-Values:

■ Basement (below grade)	
Int. Air Film	R-0.68
18" Concrete	R-1.44
Ext. Air Film	R-0.17
Total R-Value	R-2.29
■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
Wall Cavity	R-1.00
Rigid Insulation	R-6.00
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-9.76
■ Windows and Doors	
Double Pane Glass	R-2.04
(1/2" air gap)	
Hollow Metal Door	R-0.60
Total R-Value	R-2.64

Description of Building HVAC

The operations building is heated by gas fired roof top units. The heating units are two Reznor natural gas heating only units. The units are controlled by thermostats located within the spaces.

Building cooling is provided by a Trane packaged air cooled roof top unit.

The building has an exhaust fan for each of the 3 lab hoods. The bathrooms also have switch-operated exhaust fans.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.10.3 Headworks Building

Description of Building Envelope

The building was constructed in 1987. The building exterior cavity wall system is constructed from masonry, brick, a 2" air space and rigid insulation. The building foundation is concrete and in good condition. The building roof is a black rubber membrane stone ballasted system and in fair condition.

The building windows are aluminum framed casement windows with 1" insulated glass. The window sealant is cracking and starting to crumble, recommend resealing windows. The building garage door is an insulated aluminum door and in fair condition. The building aluminum man doors are in good condition.

Existing R-Values:

■ Basement (below grade)	
Int. Air Film	R-0.68
18" Concrete	R-1.44
Ext. Air Film	R-0.17
Total R-Value	R-2.29
■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
Wall Cavity	R-1.00
Rigid Insulation	R-6.00
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-9.76
■ Windows and Doors	
Double Pane Glass	R-2.04
(1/2" air gap)	
Aluminum Man Door	R-0.60
Garage Door (Alum./Insul.)	R-5.90
Total R-Value	R-8.54

Description of Building HVAC

The building was originally heated by roof mounted, gas fired, make-up air units. As these units have failed the site has installed gas fired unit heaters in the space. The

unit heaters heat the space but they do not introduce new air. Therefore the spaces where the make-up air units are not functioning may be under ventilated.

The space is cooled by ventilation. A dedicated exhaust fan and fresh air damper draw cooler outdoor air through the space.

The space heating is controlled by the onboard controls of the unit heaters and make up air units.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.10.4 Primary Pumping Building

Description of Building Envelope

The building was constructed in 1987. The building exterior stairwell is concrete which provides access to the concrete structure that is mostly below grade. There are various penetrations through the roof of the concrete structure which are not properly weathered sealed. Infiltration of water is noticeable, rust and water stains are visible on duct penetrations. The building foundation is concrete and in good condition.

The building aluminum man door is in good condition.

Existing R-Values:

■ Basement (below grade)	
Int. Air Film	R-0.68
12" Concrete	R-0.96
Ext. Air Film	R-0.17
Total R-Value	R-1.81
■ Structure (above grade)	
Int. Air Film	R-0.68
12" Concrete	R-0.96
Ext. Air Film	R-0.17
Total R-Value	R- 1.81
■ Roof	
Int. Air Film	R-0.68
12" Concrete	R-0.96
Ext. Air Film	R-0.17
Total R-Value	R- 1.81
■ Windows and Doors	
Aluminum Man Door	R-0.60

Description of Building HVAC

The primary pump gallery was originally heated by a make-up air unit on the roof of the pumping gallery. That unit has been replaced with a Modine, gas fired unit heater, rated at 100 MBH output. The unit heater does replace the heating provided by the original unit but not the fresh air. This may cause the space to be under ventilated.

The space has an exhaust fan. It was operating at the time of the site visit.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.10.5 Secondary Pumping Building

Description of Building Envelope

The building was constructed in 1987. The building exterior walls are concrete, half of the structure is below grade. The building foundation is concrete and in good condition. .

The building aluminum man door is in good condition.

Existing R-Values:

■ Basement (below grade)	
Int. Air Film	R-0.68
12" Concrete	R-0.96
Ext. Air Film	R-0.17
Total R-Value	R-1.81
■ Structure (above grade)	
Int. Air Film	R-0.68
12" Concrete	R-0.96
Ext. Air Film	R-0.17
Total R-Value	R- 1.81
■ Roof	
Int. Air Film	R-0.68
12" Concrete	R-0.96
Ext. Air Film	R-0.17
Total R-Value	R- 1.81
■ Windows and Doors	
Aluminum Man Door	R-0.60

Description of Building HVAC

The secondary pump gallery was originally heated by a make-up air unit on the roof of the pumping gallery. That unit has been replaced with 2 Modine, gas fired unit heaters, rated at 100 MBH output each. The unit heater does replace the heating provided by the original unit but not the fresh air. This may cause the space to be under ventilated.

The space has an exhaust fan. It was operating at the time of the site visit.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.10.6 Blower Building

Description of Building Envelope

The building was constructed in 1987. The building exterior cavity wall system is constructed from masonry, brick, a 2" air space and rigid insulation. The building foundation is concrete and in good condition. The building roof is a black rubber membrane stone ballasted system and in fair condition.

The building windows are aluminum framed fixed and awing windows with 1" insulated glass. The window sealant is cracking and starting to crumble, recommend resealing windows. The building garage door is an insulated aluminum door and in fair condition. The building aluminum man doors are in good condition.

Existing R-Values:

■ Basement (below grade)	
Int. Air Film	R-0.68
18" Concrete	R-1.44
Ext. Air Film	R-0.17
Total R-Value	R-2.29
■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
Wall Cavity	R-1.00
Rigid Insulation	R-6.00
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-9.76
■ Windows and Doors	
Double Pane Glass	R-2.04

(1/2" air gap)	
Aluminum Man Door	R-0.60
Garage Door (Alum./Insul.)	R-5.90
Total R-Value	R-8.54

Description of Building HVAC

The Blower building is heated by 2 natural gas fired unit heaters. The unit heaters are Reznor and are about 100 MBH output each. The unit heaters are controlled by wall thermostats.

The building is cooled by ventilation cooling. The space has dedicated exhaust fans and fresh air louvers which are controlled by a wall thermostat.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.10.7 Pump House

Description of Building Envelope

The building was constructed in 1987. The building exterior cavity wall system is constructed from masonry, brick, 2" air space and rigid insulation. The building foundation is concrete and in good condition. The building roof is pitched and constructed from wood trusses and asphalt shingles.

The building windows are aluminum framed casement windows with 1" insulated glass. The window sealant is cracking and starting to crumble, recommend resealing windows. The building garage doors are insulated steel doors and in fair condition. The building aluminum man doors are in good condition.

Existing R-Values:

- Structure (above grade)

Int. Air Film	R-0.68
8" CMU	R-1.11
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-2.76
- Roof

Asphalt Shingles	R-0.44
Sheathing	R-0.80
Total R-Value	R-1.24
- Windows and Doors

Double Pane Glass (1/2" air gap)	R-2.04
Aluminum Man Door	R-0.60
Total R-Value	R-2.64

Description of Building HVAC

The Pump house is heated by a gas fired make up air unit in the stock room and an electric unit heater in the pump room. The make-up air unit is a Reznor rated at 62.5 to 100 MBH output. This unit is controlled by a wall thermostat. The electric unit heater is an Emerson chromalux rated at 15 kW. This unit is regulated by unit mounted controls.

No cooling was observed at the time of the audit.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.10.8 Sludge Thickening Building

Description of Building Envelope

The building was constructed in 1987. The building exterior cavity wall system is constructed from masonry, brick, a 2" air space and rigid insulation. The building foundation is concrete and in good condition. The building roof is one year old white thermal plastic olefin (TPO) with rigid insulation and in good condition.

The building garage door is an insulated aluminum door and in fair condition. The building hollow metal door is in good condition.

Existing R-Values:

■ Basement (below grade)	
Int. Air Film	R-0.68
18" Concrete	R-1.44
Ext. Air Film	R-0.17
Total R-Value	R-2.29
■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
Wall Cavity	R-1.00
Rigid Insulation	R-6.00
4" Brick	R-0.80
Ext. Air Film	R-0.17

Total R-Value	R-9.76
■ Windows and Doors	
Double Pane Glass (1/2" air gap)	R-2.04
Hollow Metal Door	R-0.60
Total R-Value	R-2.64

Description of Building HVAC

Sludge thickening was originally heated by a gas fired unit heater and a make-up air unit on the roof of the pumping gallery. The Reznor make-up air unit is rated for 3980 CFM and 400 MBH. That unit has been replaced with 2 Modine, gas fired unit heaters, rated at 100 MBH output each. The unit heater does replace the heating provided by the original unit but not the fresh air. This may cause the space to be under ventilated. The bathroom is heated by a Chromalux electric cabinet heater. The basement is heated by a Q mark electric unit heater. All of the unit heaters and cabinet heaters are controlled by the unit mounted controls.

The space has 3 exhaust fans. The fans were operating at the time of the site visit.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.10.9 Sludge Disposal Building

Description of Building Envelope

The building was constructed in 1987. The building exterior cavity wall system is constructed from masonry, brick, 2" air space and rigid insulation. The building foundation is concrete and in good condition. The building roof is one year old white thermal plastic olefin (TPO) with rigid insulation and is in good condition.

The building windows are aluminum framed casement windows with 1" insulated glass. The window sealant is cracking and starting to crumble, recommend resealing windows. The building hollow metal and aluminum man doors are in good condition.

Existing R-Values:

■ Basement (below grade)	
Int. Air Film	R-0.68
18" Concrete	R-1.44
Ext. Air Film	R-0.17

	Total R-Value	R-2.29
■ Structure (above grade)		
	Int. Air Film	R-0.68
	8" CMU	R-1.11
	Wall Cavity	R-1.00
	Rigid Insulation	R-6.00
	4" Brick	R-0.80
	Ext. Air Film	R-0.17
	Total R-Value	R-9.76
■ Windows and Doors		
	Double Pane Glass	R-2.04
	(1/2" air gap)	
	Hollow Metal Door	R-0.60
	And Alum. Man Door	
	Total R-Value	R-2.64

Description of Building HVAC

The building has gas fired unit heaters in the belt filter press room, maintenance storage, and garage. The electric room has a Space MOD electric unit heater rated at 5 kW.

The maintenance office was cooled by a 1 ton window air conditioner.

The space is ventilated by 5 roof top exhaust fans.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

2.10.10 Remote Pump Stations

Description of Building HVAC

All the remote pump stations were heated by electric unit heaters. Unit heaters are rated at 5 kW. The unit heaters were set to maintain 55°F. The units are controlled by their onboard controls.

The pump houses are cooled by ventilation cooling. A dedicated fan is controlled by a line voltage thermostat to draw fresh air through the space to cool it. The thermostats were set for 80°F.

Description of Building Lighting

The buildings existing lighting system consists of 1X4 (1, 2 lamp), 2X2 (2 lamp), 2X4 (2 lamp) T8 fixtures with electronic ballasts, 2x4 (2, 3 lamp) T12 standard efficiency linear fluorescent fixtures with magnetic ballasts, and incandescent fixtures. Existing exterior lighting consists of HID, and incandescent fixtures. Refer to Section 4 for a more detailed description.

Broad Street PS

Description of Building Envelope

The building was constructed in 1988. The building exterior cavity wall system is constructed from masonry, brick, 2" air space and rigid insulation. The building foundation is concrete and in good condition. The building roof is black rubber membrane stone ballasted system and in good condition.

The building has no windows. The building aluminum man doors are in fair condition.

Existing R-Values:

■ Basement (below grade)	
Int. Air Film	R-0.68
18" Concrete	R-1.44
Ext. Air Film	R-0.17
Total R-Value	R-2.29
■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
Wall Cavity	R-1.00
Rigid Insulation	R-6.00
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-9.76
■ Windows and Doors	
Aluminum Man Door	R-0.60
Total R-Value	R-2.64

Cherry Hill Drive PS

Description of Building Envelope

The building was constructed in 1979. The building exterior walls are 4" precast concrete. The building foundation is concrete and in good condition. The building roof is sloped concrete.

The building has no windows. The building hollow metal door is in good condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
4" Precast Concrete	R-0.81
Ext. Air Film	R-0.17
Total R-Value	R-1.66
■ Roof	
Sloped Concrete	R-1.22
■ Windows and Doors	
Hollow Metal Door	R-0.60

Cross Street PS

Description of Building Envelope

The building was constructed in 1990. The building exterior walls are 8" concrete block. The building foundation is concrete and in good condition. The building roof is pitched and constructed from wood trusses and asphalt shingles with no insulation.

The building has no windows. The building hollow metal door is in good condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
8" CMU	R-1.11
Ext. Air Film	R-0.17
Total R-Value	R-1.96
■ Roof	
Asphalt Shingles	R-0.44
Sheathing	R-0.80
Total R-Value	R-1.24
■ Windows and Doors	
Hollow Metal Door	R-0.60

Drayla Drive PS

Description of Building Envelope

The building was constructed in 1976. The building exterior walls made from wood paneling, sheathing and studs with no insulation. The building foundation is concrete slab on grade and in good condition. The building roof is pitched and constructed from wood trusses and asphalt shingles with no insulation. The asphalt shingles are pulling away from the roof and a hole is noticeable at the ridge line of the roof.

The building has no windows. The building wood door is in good condition.

Existing R-Values:

■ Structure (above grade)		
	Int. Air Film	R-0.68
	Wood Sheathing	R-0.80
	Wood Paneling	R-0.80
	Ext. Air Film	R-0.17
	Total R-Value	R-2.45
■ Roof		
	Asphalt Shingles	R-0.44
	Sheathing	R-0.80
	Total R-Value	R-1.24
■ Windows and Doors		
	Wood Door	R-0.80

E Main Street PS

Description of Building Envelope

The building was constructed in 1986. The building exterior walls are made from 4" brick solid brick. The building foundation is concrete and in good condition. The building roof is pitched and constructed from wood trusses and asphalt shingles with no insulation.

The building has no windows. The building aluminum man door is in good condition.

Existing R-Values:

■ Structure (above grade)		
	Int. Air Film	R-0.68
	4" Brick (12" solid)	R-2.40
	Ext. Air Film	R-0.17
	Total R-Value	R-3.25
■ Roof		
	Asphalt Shingles	R-0.44
	Sheathing	R-0.80
	Total R-Value	R-1.24
■ Windows and Doors		
	Aluminum Man Door	R-0.60

Ivy Drive PS

Description of Building Envelope

The building was constructed in 1968. The building exterior walls are 8" concrete block. The building foundation is concrete and in good condition. The building roof is sloped and constructed from wood members and asphalt shingles with no insulation.

The building has no windows. The building wood door is in good condition.

Existing R-Values:

■ Structure (above grade)		
	Int. Air Film	R-0.68
	8" CMU	R-1.11
	Ext. Air Film	R-0.17
	Total R-Value	R-1.96
■ Roof		
	Asphalt Shingles	R-0.44
	Sheathing	R-0.80
	Total R-Value	R-1.24
■ Windows and Doors		
	Wood Door	R-0.80

Julia Road PS

Description of Building Envelope

The building was constructed in 1968. The building exterior walls are corrugated sheet metal with an insulating liner panel at the interior of the structure. The building foundation is concrete and in good condition. The building roof is sloped and constructed from corrugated sheet metal with no insulation.

The building window is hollow metal framed with single pane glass. The building hollow metal door is in fair condition.

Existing R-Values:

■ Structure (above grade)		
	Int. Air Film	R-0.68
	Sheet Metal	Negligible
	Insulated Liner Panel	R-5.00
	Ext. Air Film	R-0.17
	Total R-Value	R-5.86
■ Roof		
	Sheet Metal	Negligible
■ Windows and Doors		
	Single Pane Glass	R-0.91
	Hollow Metal Door	R-0.60
	Total R-Value	R-1.51

Lake Avenue PS

Description of Building Envelope

The building was constructed in 1986. The building exterior walls are constructed from wood and wood siding. The building foundation is concrete and in good

condition. The building roof is pitched and constructed from wood trusses and asphalt shingles.

The building has no windows. The building wood door is in good condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
Gypsum Wall Board	R-0.56
Sheathing	R-0.80
Wood Siding	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-3.01
■ Roof	
Asphalt Shingles	R-0.44
Sheathing	R-0.80
Batt Insulation	R-19.00
Total R-Value	R-20.24
■ Windows and Doors	
Wood Door (solid core)	R-0.80

Lufkin Lane PS

Description of Building Envelope

The building was constructed in 2000. The building exterior walls are 4" precast concrete. The building foundation is concrete and in good condition. The building roof is sloped concrete.

The building has no windows. The building hollow metal door is in good condition.

Existing R-Values:

■ Structure (above grade)	
Int. Air Film	R-0.68
4" Precast Concrete	R-0.81
Ext. Air Film	R-0.17
Total R-Value	R-1.66
■ Roof	
Sloped Concrete	R-1.22
■ Windows and Doors	
Hollow Metal Door	R-0.60

Matthews Street, Middle Street and Minor Road PS

Description of Building Envelope

The building was constructed in 1973. The building exterior walls are masonry with 4" brick veneer over 8" concrete block. The building foundation is concrete and in good condition. The building roof is pitched and constructed from wood trusses and asphalt shingles with no insulation.

The building has no windows. The building hollow metal door is in good condition.

- Existing R-Values: Structure (above grade)

Int. Air Film	R-0.68
8" CMU	R-1.11
4" Brick	R-0.80
Ext. Air Film	R-0.17
Total R-Value	R-2.76
- Windows and Doors

Hollow Metal Door	R-0.60

Tyler Way PS

Description of Building Envelope

The building was constructed in 1996. The building exterior walls are 4" precast concrete. The building foundation is concrete and in good condition. The building roof is sloped concrete.

The building has no windows. The building hollow metal door is in good condition.

Existing R-Values:

- Structure (above grade)

Int. Air Film	R-0.68
4" Precast Concrete	R-0.81
Ext. Air Film	R-0.17
Total R-Value	R-1.66
- Roof

Sloped Concrete	R-1.22
- Windows and Doors

Hollow Metal Door	R-0.60

Section 3

Baseline Energy Use

3.1 Utility Data Analysis

The first step in the energy audit process is the compilation and quantification of the facility's current and historical energy usage and associated utility costs. It is important to establish the existing patterns of electricity, gas, and oil usage in order to be able to identify areas in which energy consumption can be reduced.

For this study, the monthly gas and electric bills per facility were analyzed and unit costs of energy were obtained. The unit cost of energy, as determined from the information provided by the City, was utilized in determining the feasibility of switching from one energy source to another or reducing the demand on that particular source of energy to create annual cost savings for the City.

3.1.1 Electric Charges

It is important to understand how the utilities charge for the service. The majority of the energy consumed is electric as a result of both indoor and outdoor lighting and appliances, such as kitchen appliances, computers, printers and projectors. Electricity is charged by three basic components: electrical consumption (kWh), electrical demand (kW) and power factor (kVAR) (reactive power). The cost for electrical consumption is similar to the cost for fuel and the monthly consumption appears on the utility bill as kWh consumed per month with a cost figure associated with it. The service connections are either billed on a flat rate or time of day rates per kWh.

Electrical demand can be as much as 50 percent or more of the electric bill. The maximum demand (kW value) during the billing period is multiplied by the demand cost factor and the result is added to the electric bill. It is often possible to decrease the electric bill by 15 – 25 percent by reducing the demand, while still using the same amount of energy.

The power factor (reactive power) is the power required to energize electric and magnetic fields that result in the production of real power. Power factor is important because transmission and distribution systems must be designed and built to manage the need for real power, as well as the reactive power component (the total power). If the power factor is low, then the total power required can be greater than 50 percent or more than the real power alone. The power factor charge is a penalty for having a low power factor. This penalty charge is not applied to any of the City's buildings included in this report.

The other parts of the electric bill are the distribution charges, Competitive Transition Assessment (CTA) charges, combined public benefits charges and the FMCC (Federally Mandated Congestion Charges), which cannot be avoided.

Transcanada Power Marketing LT is the current electric supplier and Connecticut Light and Power (CL&P) the current distributor of electric energy for the City.

The City facilities are billed as different flat rate services and the Water Treatment Plant and the Water Pollution Control Plant (WPCP), are both billed as time of day rate classes (peak/off-peak rate structures). The most recent tariff rates available at the time of this audit for the electrical service from CL&P are as summarized in the following tables.

4.1-1: Electric Service Classes and Associated Tariffs						
	Rate 1 ¹	Rate 27 ²	Rate 30 ³	Rate 35 ⁴	Rate 37 ⁵	Rate 56 ⁶
Transmission Charge:	\$0.01785/ kWh	\$2.39/ kW	\$4.79/ kW	\$5.29/ kW	\$2.65/kW	\$5.52/kVA
		\$0.01673/ kWh (On-Peak)				
		\$0.00402/ kWh (Off-Peak)				
Distribution Charges:	\$0.02023/ kWh	\$0.03603/ kWh (On-Peak)	\$0.0178/ kWh	\$5.42/ kW	\$0.01617/kWh (On-Peak)	-
		\$0.01552/ kWh (Off-Peak)			\$0.0037/kWh (Off-Peak)	-
		\$4.45/ kW	\$4.45/ kW		\$5.42/kW	\$5.59/kVA
CTA Charges:	\$0.01064/ kWh	\$0.00335/ kWh (On-Peak)	\$0.00335/ kWh	\$0.00229/ kWh	\$0.00226/kWh (On-Peak)	\$0.00233/kWh (On-Peak)
		\$0.00335/ kWh (Off-Peak)		\$2.74/ kW	\$0.00226/kWh (Off-Peak)	\$0.002140/kWh (Off-Peak)
		\$2.86/ kW	\$2.86/ kW		\$2.74/kW	\$3.0/kVA
FMCC Delivery Charges:	\$0.00264/ kWh	\$0.00497/ kWh (On-Peak)	\$0.00239/ kWh	\$0.00222/ kWh	\$0.00485/kWh (On-Peak)	\$0.004760/kWh (On-Peak)
		\$0.0012/ kWh (Off-Peak)			\$0.00111/kWh (Off-Peak)	\$0.001070/kWh (Off-Peak)
Combined Public Benefits Charge:	\$0.00692/ kWh	\$0.00544/ kWh	\$0.00544/ kWh	\$0.00535/ kWh	\$0.00535/kWh	\$0.00535/kWh

1. Rate 1 is defined as 'residential electric service'. The Chemical and Control Bldg falls under Rate 1.
2. Rate 27 is a 'small time-of-day general electric service'. The Bathhouse and Muzzy Field fall under Rate 27.
3. Rate 30 is the 'small general electric service' rate for locations with annual maximum demands less than 200 kW. This is the majority of the City's facilities.
4. Rate 35 is the 'intermediate general electric service' rate for locations with an annual demand less than 200 kW. The Public Library falls under Rate 35.
5. Rate 37 is the 'intermediate time-of-day general electric service' rate for locations with annual demands between 200 and 350 kW. This rate is applied to the Main Library and the City Hall Annex.

6. Rate 56 is for 'intermediate time-of-day electric service for non-mfrs'. This is the rate applied to locations with annual maximum demands between 350 and 1,000 kW. This rate is applied to the WPCP.

The following table summarizes the 2009 rates from the City's electric supplier TransCanada.

	All Accounts
Base Rate:	\$0.1075/kWh
Congestion Charge:	\$0.0012/kWh
Auction Revenue:	(\$0.001/kWh)
Capacity Charge:	\$0.0026/kWh
CCM Fee:	\$0.00133/kWh

3.1.2 Natural Gas Charges

Yankee Gas is the current supplier and Hess Energy the current distributor of natural gas for the City. The City is charged for the cost of the natural gas, a delivery charge, a demand charge (as applicable) and a customer charge, which covers gas administration charges.

3.2 City Hall

3.2.1 City Hall

Figure 3.2-1 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for City Hall is approximately, 50,000 kWh /month. Electrical usage has been averaged by month for the referenced time period, to portray a more encompassing monthly usage trend. Data is therefore presented in a format that demonstrates building electrical consumption, by month, for a typical year. Data is presented in this manner for all buildings analyzed.

Table 3.2-1 illustrates the seasonal peak demand loads for the City Hall from April 2009 through August 2010.

Figure 3.2-1: City Hall Electricity Usage

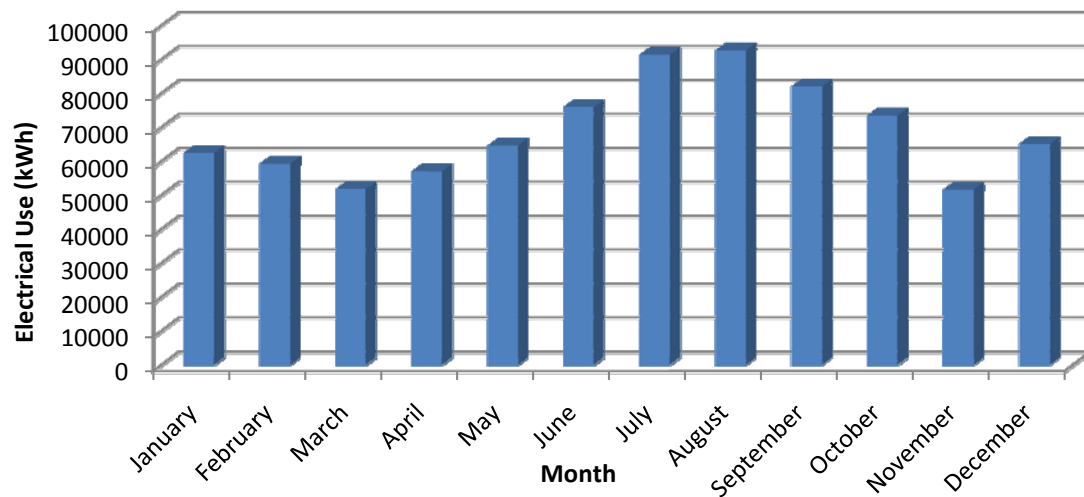


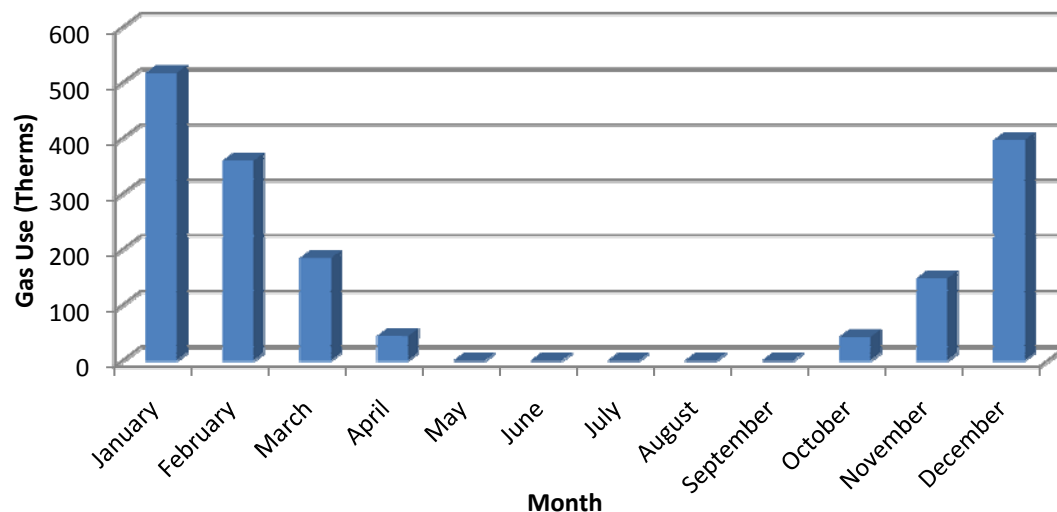
Table 3.2-1: City Hall Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	319
Winter	282

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.2 -2 illustrates the monthly average natural gas consumption at City Hall from August 2008 through July 2010.

Figure 3.2-2: City Hall Gas Usage



3.2.2 City Hall Annex

Figure 3.2-3 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for City Hall Annex is approximately, 500 kWh / month.

Table 3.2-2 illustrates the seasonal peak demand loads for the City Hall Annex from April 2009 through August 2010.

Figure 3.2-3: City Hall Annex Electricity Usage

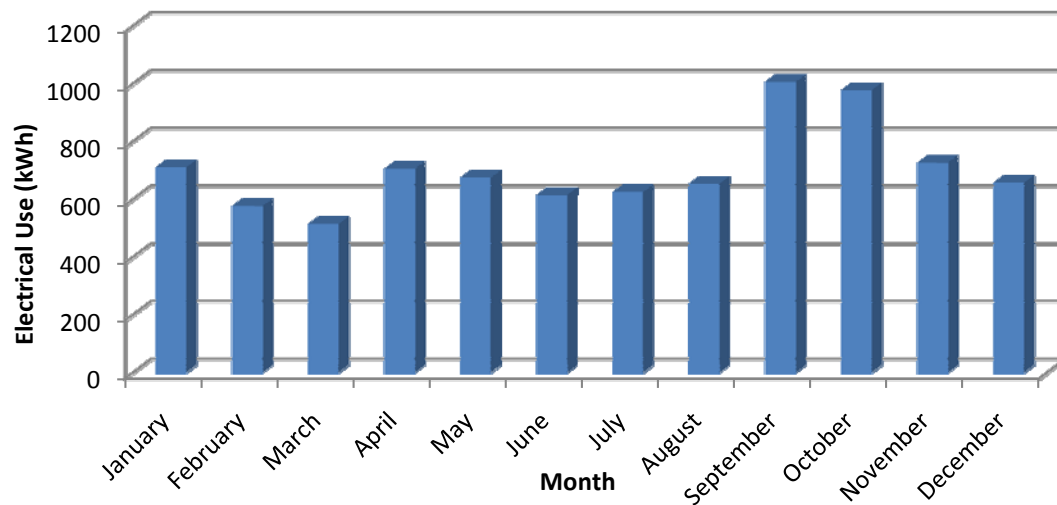


Table 3.2-2: City Hall Annex Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	3.0
Winter	2.5

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.3 Water Department

3.3.1 Main Office and Garage

Figure 3.3-1 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Department is approximately, 4,000 kWh / month.

Table 3.3-1 illustrates the seasonal peak demand loads for the Water Department from April 2009 through August 2010.

Figure 3.3-1: Water Department Office and Garage Electricity Usage

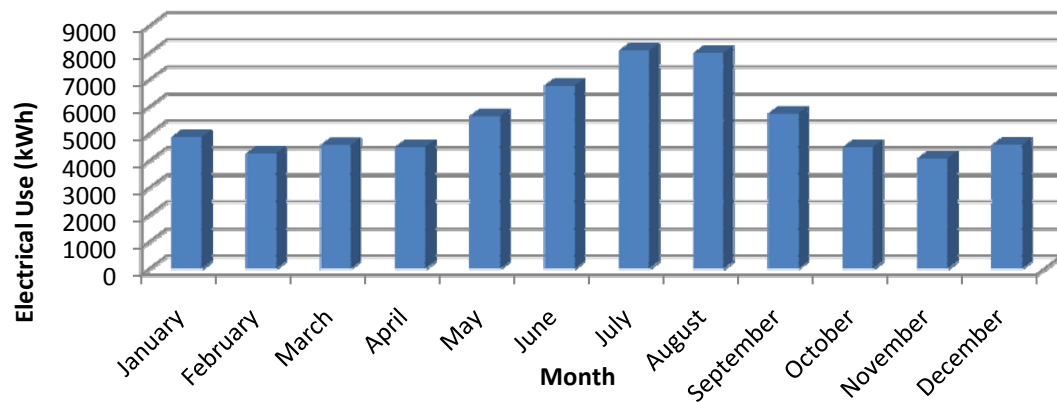


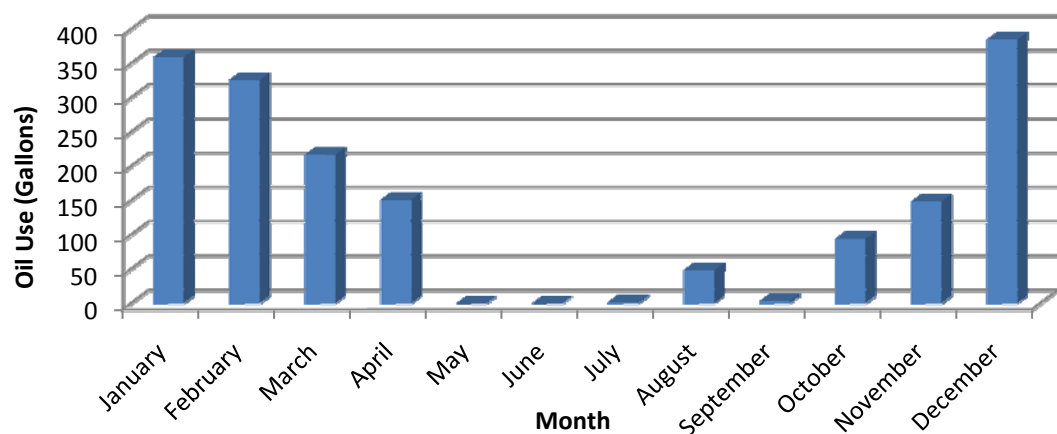
Table 3.3-1: Water Department Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	33.9
Winter	23.8

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.3 -2 illustrates the monthly average oil consumption at Water Department Office from July 2007 through April 2010.

Figure 3.3-2: Water Department Office Oil Usage



3.3.2 Water Filtration Plant & High Service Pump Station

Figure 3.3-3 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Filtration Plant & High Service Pump Station is approximately, 88,000 kWh/month.

Table 3.3-2 illustrates the seasonal peak demand loads for the Water Filtration Plant & High Service Pump Station from April 2009 through August 2010.

Figure 3.3-3: Water Filtration Plant & High Service Pump Station Electricity Usage

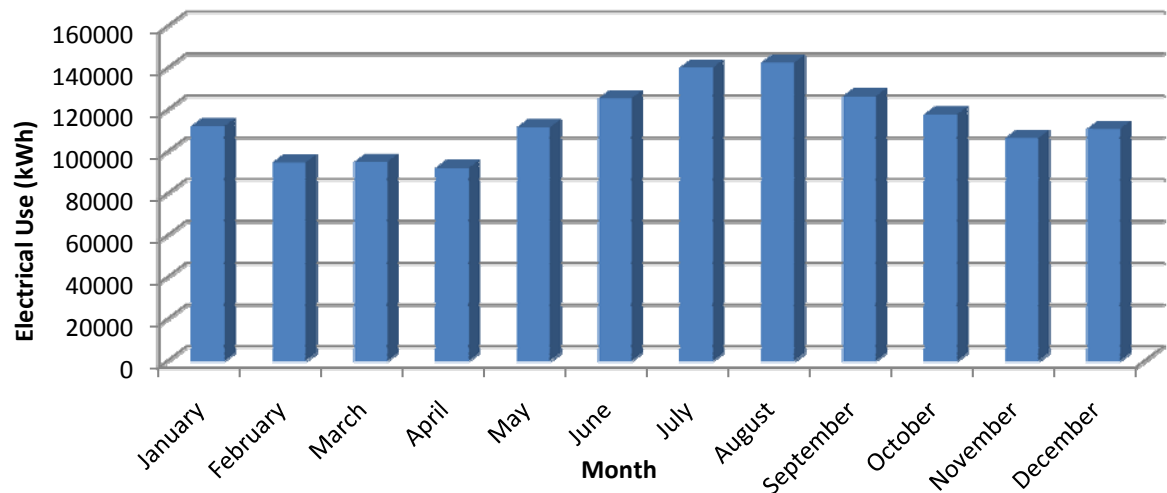


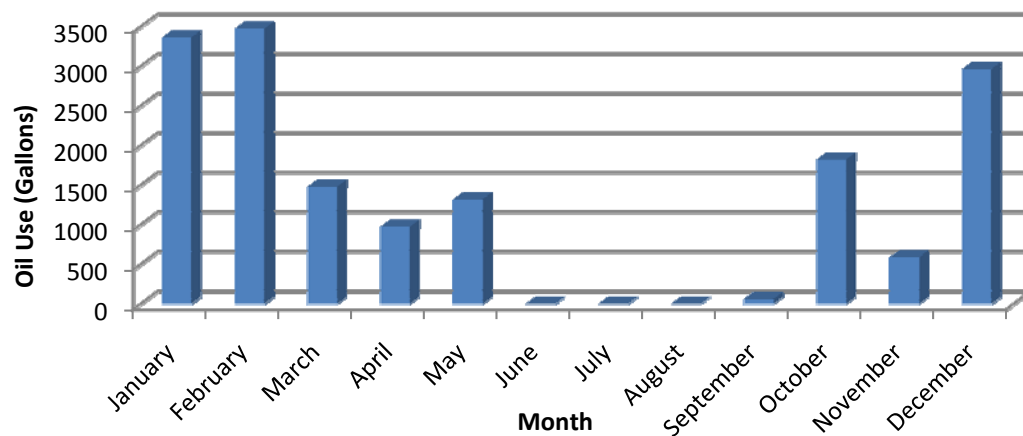
Table 3.3-2: Water Filtration Plant & High Service Pump Station Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	309
Winter	267

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.3-4 illustrates the monthly average oil consumption at Water Filtration Plant & High Service Pump Station from October 2007 through April 2010.

Figure 3.3-4: Water Filtration Plant & High Service Pump Station Oil Usage



3.3.3 Well Houses

3.3.3.1 Well House #1

Figure 3.3-5 illustrates the monthly total energy consumption from April 2009 through July 2010. From this graph, it can be determined that the baseline electrical consumption for Well House #1 is approximately, 700 kWh/month.

Table 3.3-3 illustrates the seasonal peak demand loads for the Well House #1 from April 2009 through July 2010.

Figure 3.3-5: Well House #1 Electricity Usage

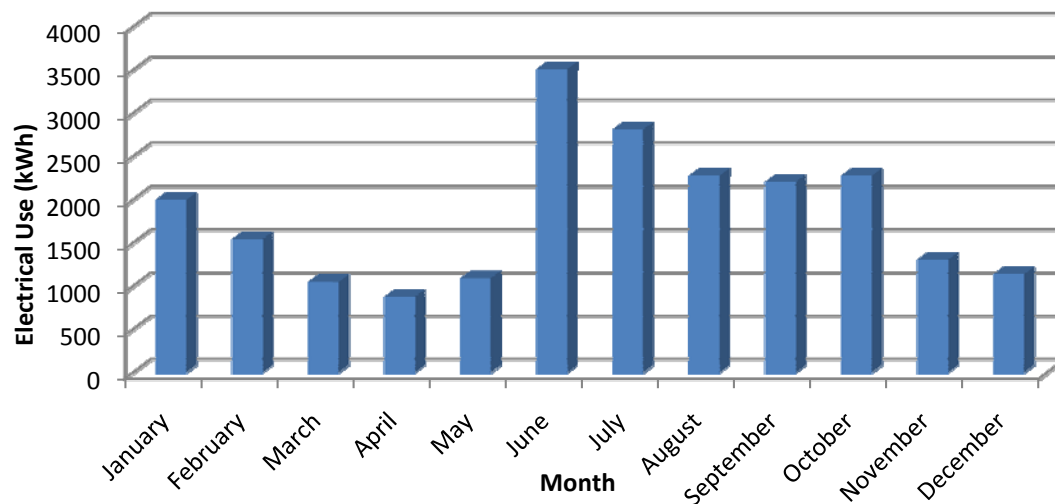


Table 3.3-3: Well House #1 Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	26.7
Winter	25.8

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.3.3.2 Well House #2

Figure 3.3-6 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Well House #2 is approximately, 12,000 kWh/month.

Table 3.3-4 illustrates the seasonal peak demand loads for the Well House #2 from April 2009 through August 2010.

Figure 3.3-6: Well House #2 Electricity Usage

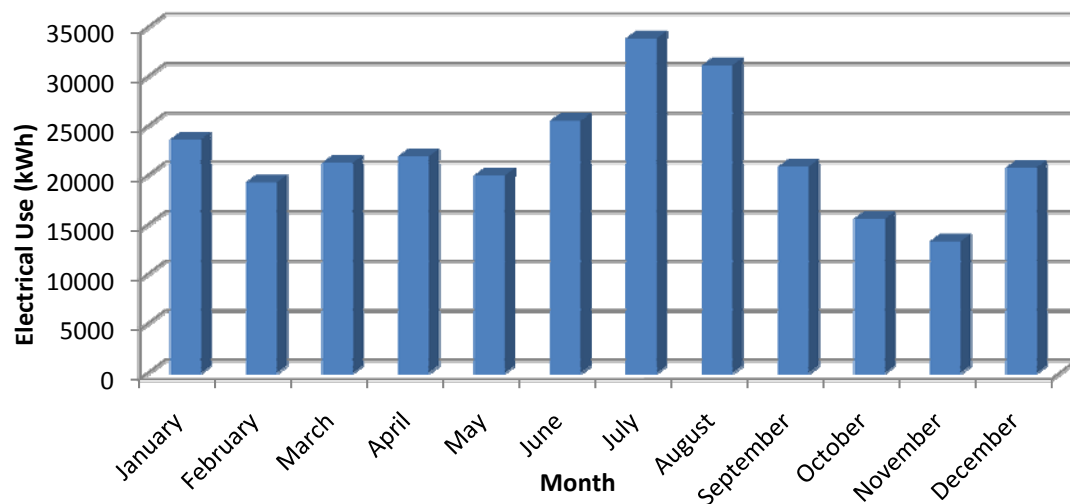


Table 3.3-4: Well House #2 Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	86.7
Winter	83.5

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.3.3.3 Well Houses #3 - 5

Figure 3.3-7 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Well Houses # 3-5 is approximately, 31,000 kWh / month.

Table 3.3-5 illustrates the seasonal peak demand loads for the Well Houses # 3-5 from April 2009 through August 2010.

Figure 3.3-7: Well Houses # 3-5 Electricity Usage

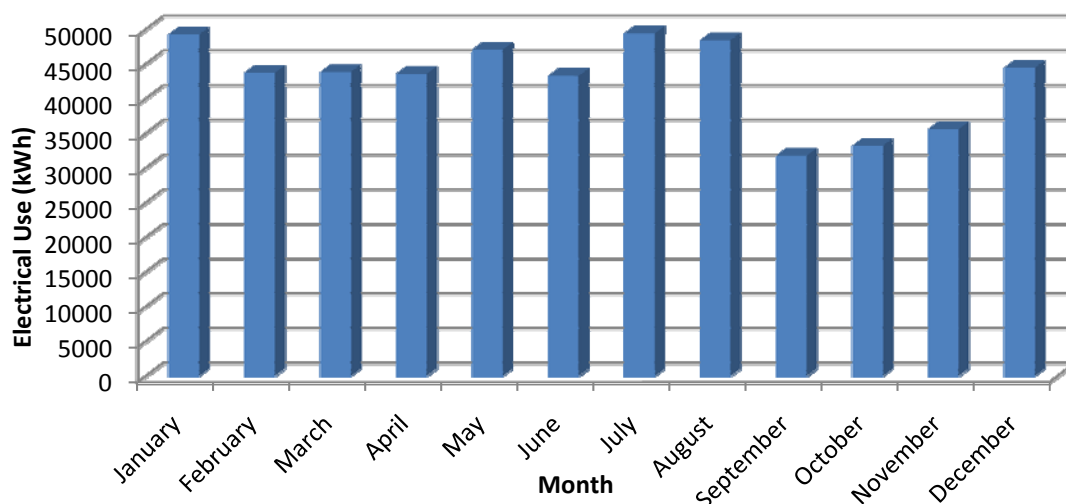


Table 3.3-5: Well Houses # 3-5 Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	97.0
Winter	100.8

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.3.4 Chemical and Control Building

Figure 3.3-8 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Chemical and Control Building is approximately, 360 kWh/month.

Table 3.3-6 illustrates the seasonal peak demand loads for the Chemical and Control Building from April 2009 through August 2010.

Figure 3.3-8: Chemical and Control Building Electricity Usage

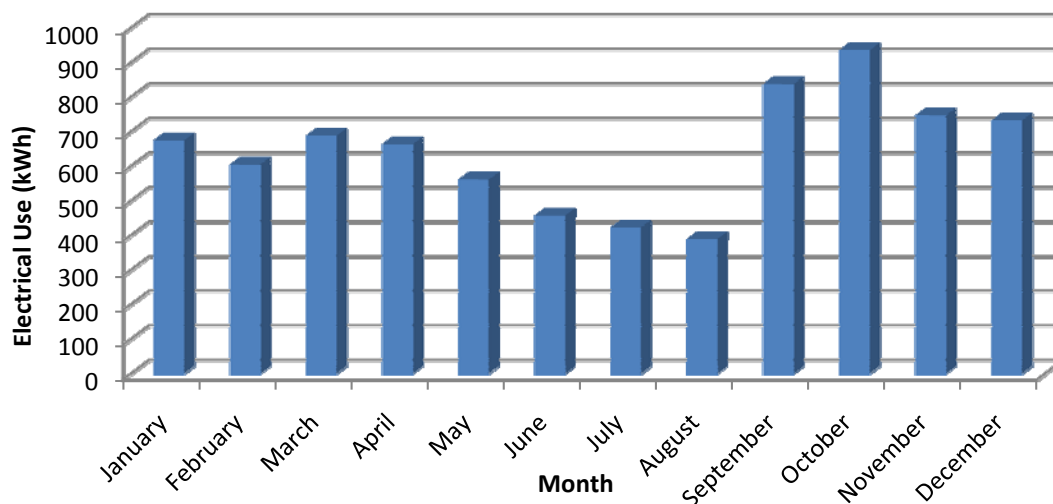


Table 3.3-6: Chemical and Control Building Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	N/A
Winter	N/A

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.3.5 Pump and Control Buildings

3.3.5.1 Pump and Control Building – Peck Lane

Figure 3.3-9 illustrates the monthly total energy consumption from March 2009 through July 2010. From this graph, it can be determined that the baseline electrical consumption for Pump and Control Building – Peck Lane is approximately, 4,300 kWh / month.

Table 3.3-7 illustrates the seasonal peak demand loads for the Pump and Control Building – Peck Lane from March 2009 through July 2010.

Figure 3.3-9: Pump and Control Building – Peck Lane Electricity Usage

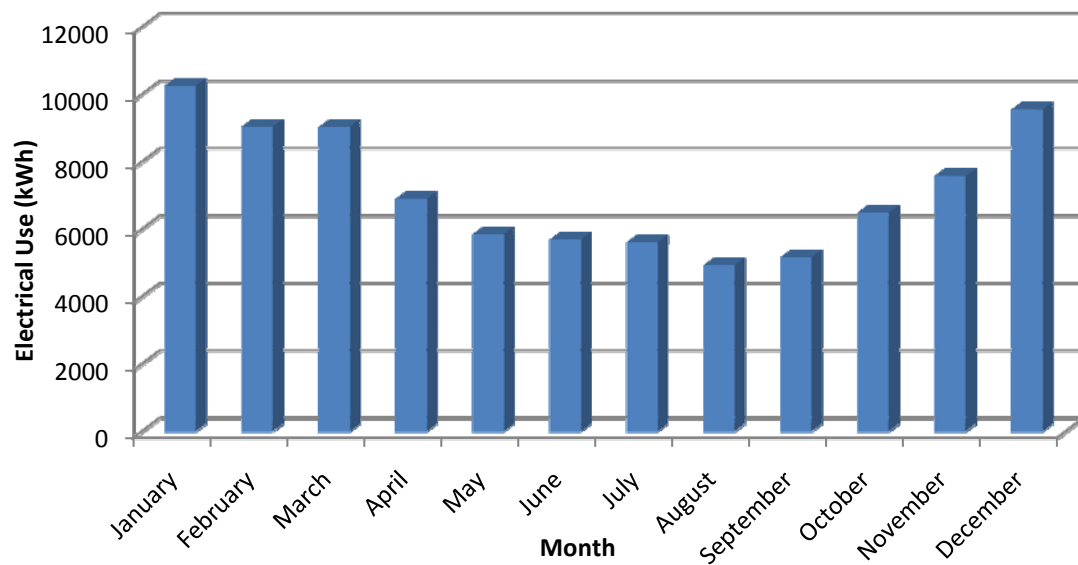


**Table 3.3-7: Pump and Control Building -
Peck Lane Seasonal Peak Demands**

Season	Peak Demand (kW)
Summer	65.4
Winter	73.5

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.3.5.2 Pump and Control Building – Wolcott Street

Figure 3.3-10 illustrates the monthly total energy consumption from March 2009 through July 2010. From this graph, it can be determined that the baseline electrical consumption for Pump and Control Building – Wolcott Street is approximately, 980 kWh / month.

Table 3.3-8 illustrates the seasonal peak demand loads for the Pump and Control Building – Wolcott Street from March 2009 through July 2010.

Figure 3.3-10: Pump and Control Building – Wolcott Street Electricity Usage

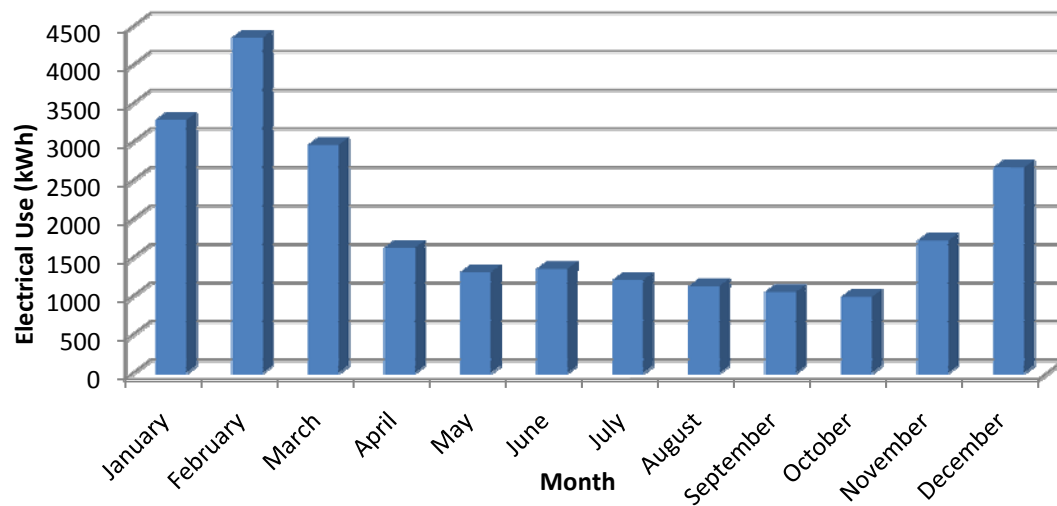


Table 3.3-8: Pump and Control Building – Wolcott Street Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	61.8
Winter	50.9

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.3.6 Pump, Control and Generator Building – Hill Street

Figure 3.3-11 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Pump, Control and Generator Building – Hill Street is approximately, 6,000 kWh/month.

Table 3.3-9 illustrates the seasonal peak demand loads for the Pump, Control and Generator Building – Hill Street from April 2009 through August 2010.

Figure 3.3-11: Pump, Control and Generator Building – Hill Street Electricity Usage

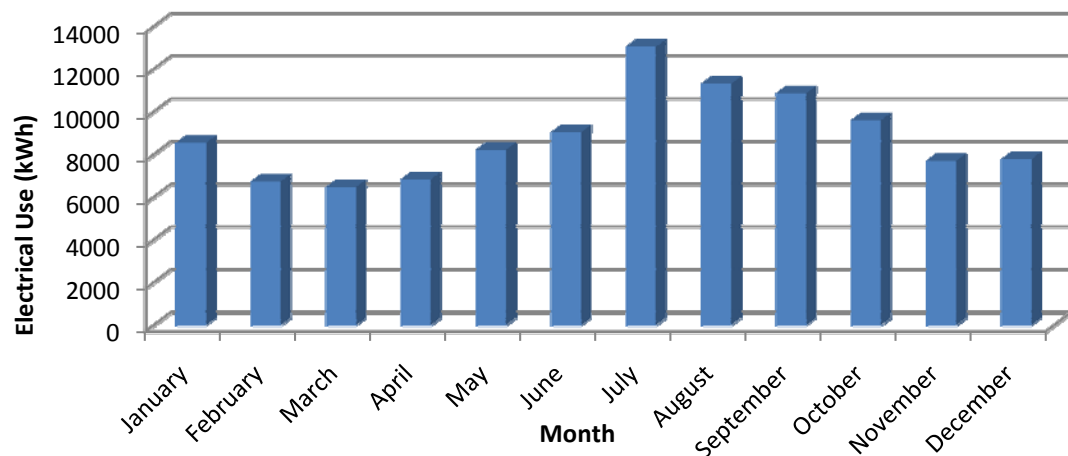


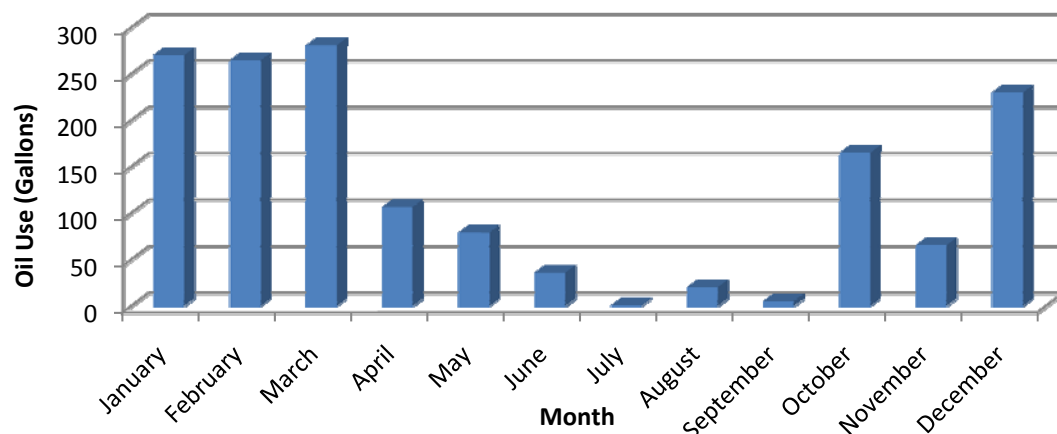
Table 3.3-9: Pump, Control and Generator Building – Hill Street Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	124
Winter	149

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.3-12 illustrates the monthly average oil consumption at Pump, Control and Generator Building – Hill Street from July 2007 through June 2010.

Figure 3.3-12: Pump, Control and Generator Building – Hill Street Oil Usage



3.4 Police Department

3.4.1 Police Department/Court Complex (w/Parking Garage)

Figure 3.4-1 illustrates the monthly total energy consumption April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Police Department/Court Complex is approximately, 80,000 kWh / month.

Table 3.4-1 illustrates the seasonal peak demand loads for the Police Department/Court Complex from April 2009 through August 2010.

Figure 3.4-1: Police Department/Court Complex Electricity Usage

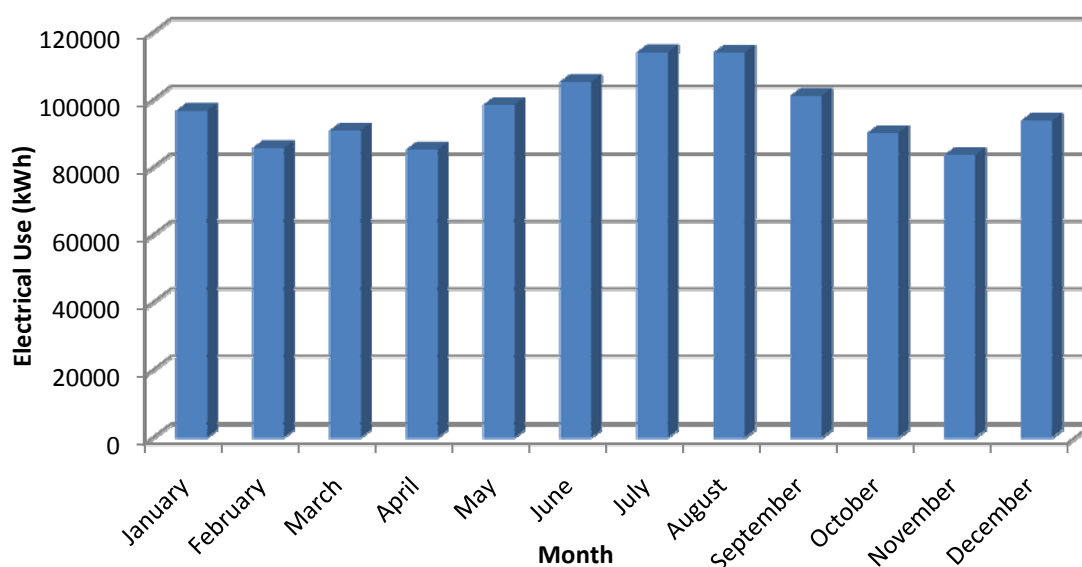


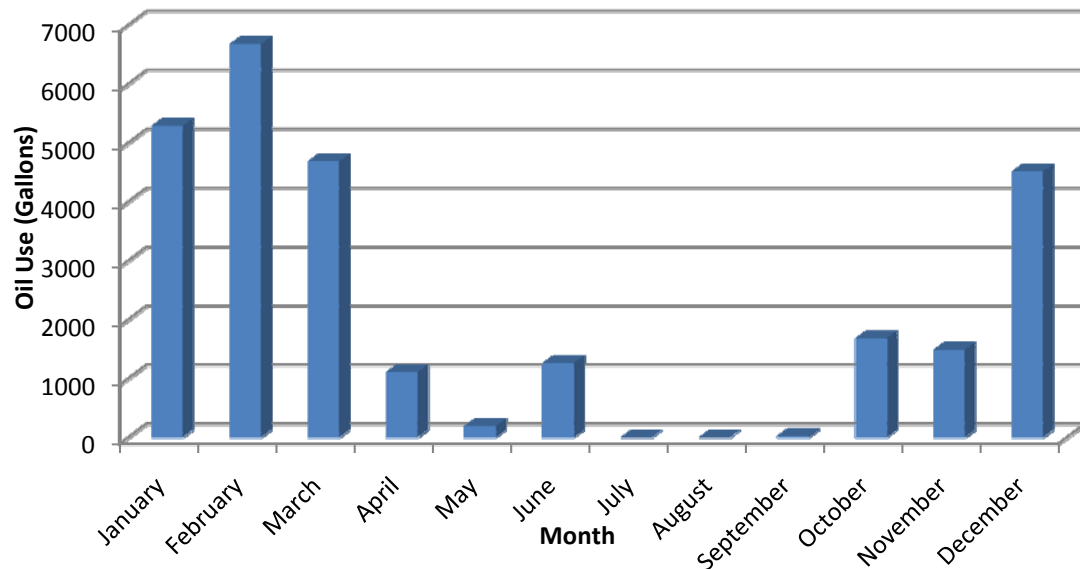
**Table 3.4-1: Police Department/
Court Complex Seasonal Peak Demands**

Season	Peak Demand (kW)
Summer	247.0
Winter	213.8

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.4-2 illustrates the monthly average oil consumption at Police Department/Court Complex from January 2007 through May 2010.

Figure 3.4-2: Police Department/Court Complex Oil Usage



3.5 Parks and Recreation

3.5.1 Rockwell Park

Figure 3.5-1 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Rockwell Park is approximately, 1,500 kWh/month.

Table 3.5-1 illustrates the seasonal peak demand loads for the Rockwell Park from April 2009 through August 2010.

Figure 3.5-1: Rockwell Park Electricity Usage

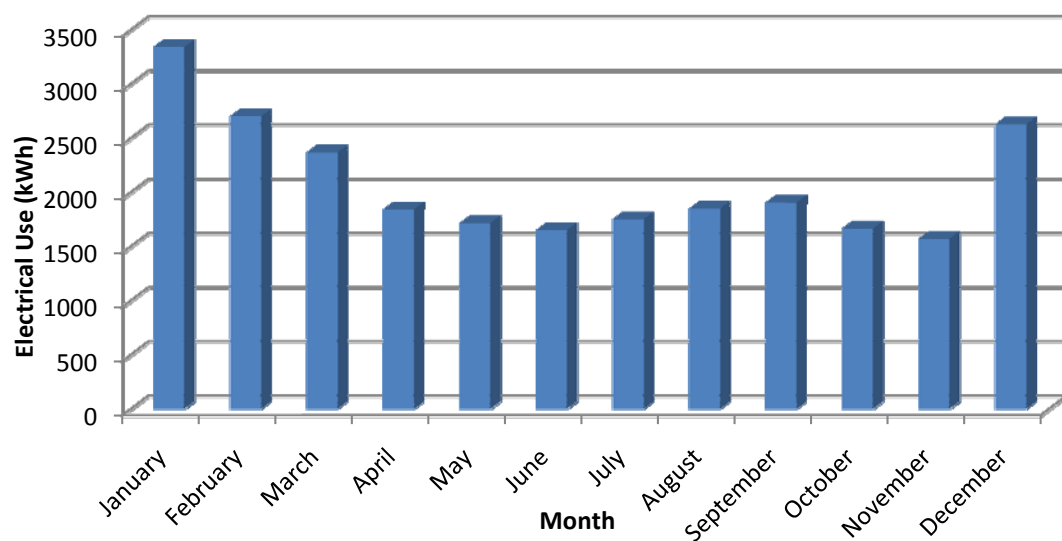


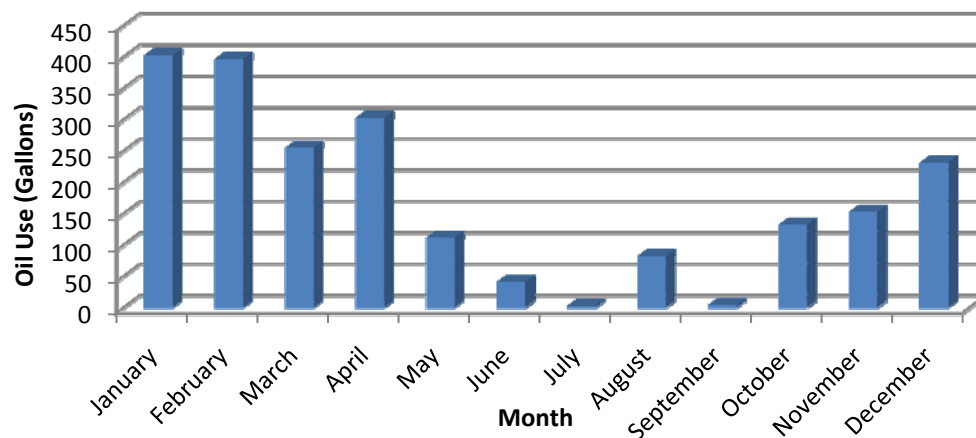
Table 3.5-1: Rockwell Park Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	10.5
Winter	9.5

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.5-2 illustrates the monthly average oil consumption at Rockwell Park from January 2007 through May 2010.

Figure 3.5-2: Rockwell Park Oil Usage



3.5.2 Rockwell Pavilion

Figure 3.5-3 illustrates the monthly total energy consumption from September 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Rockwell Pavilion is approximately, 260 kWh/month.

Table 3.5-2 illustrates the seasonal peak demand loads for the Rockwell Pavilion from September 2009 through August 2010.

Figure 3.5-3: Rockwell Pavilion Electricity Usage

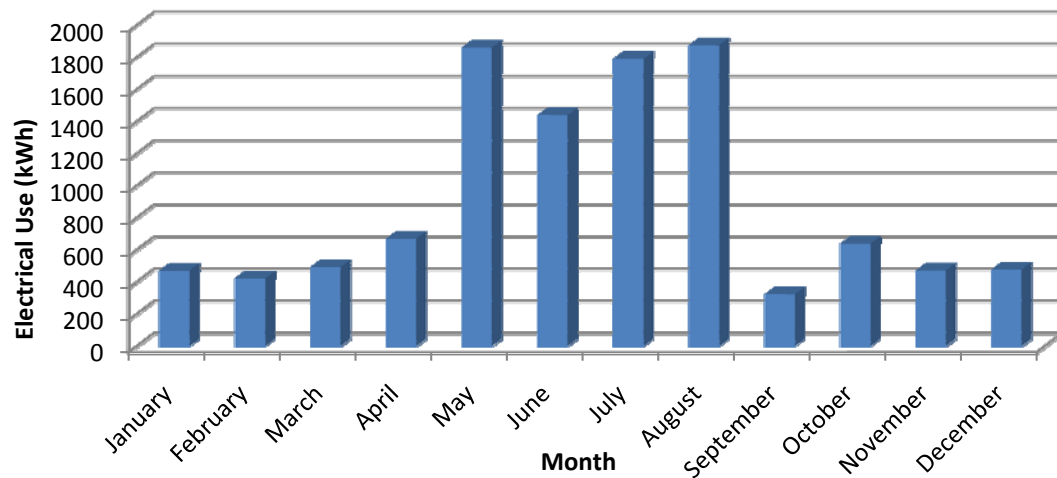


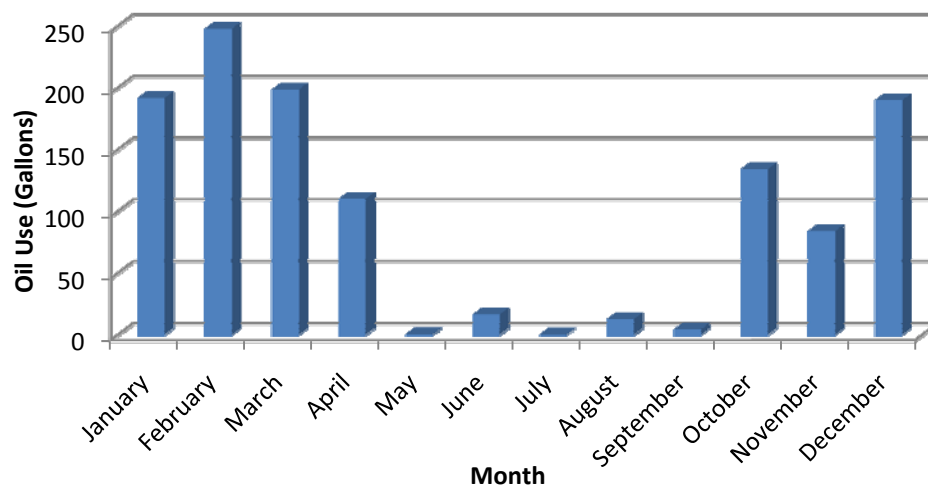
Table 3.5-2 Rockwell Pavilion Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	46.2
Winter	39.6

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.5-4 illustrates the monthly average oil consumption at Rockwell Pavilion from January 2007 through April 2010.

Figure 3.5-4: Rockwell Pavilion Oil Usage



3.5.3 Bathhouse

Figure 3.5-5 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Bathhouse is approximately, 2,900 kWh / month.

Table 3.5-3 illustrates the seasonal peak demand loads for the Bathhouse from April 2009 through August 2010.

Figure 3.5-5: Bathhouse Electricity Usage

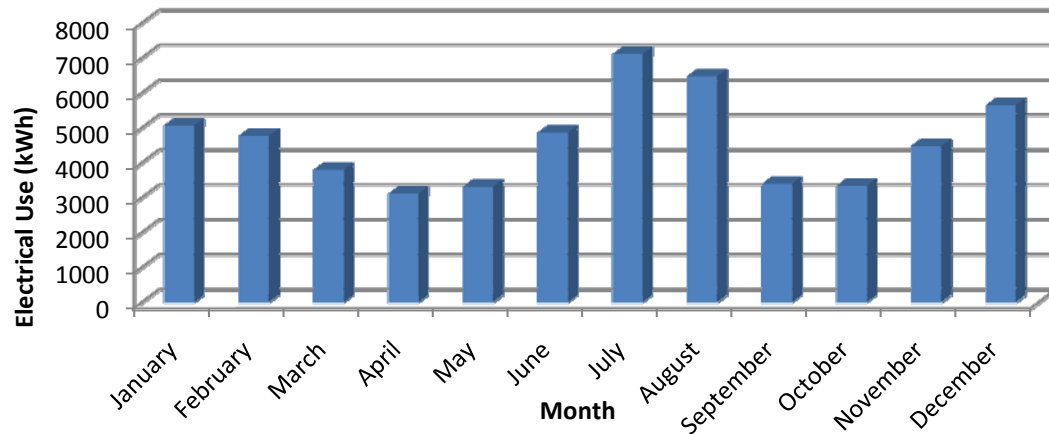


Table 3.5-3: Bathhouse Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	24.5
Winter	26.6

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.5.4 Muzzy Field

Figure 3.5-6 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Muzzy Field is approximately, 500 kWh / month.

Table 3.5-4 illustrates the seasonal peak demand loads for the Muzzy Field from April 2009 through August 2010.

Figure 3.5-6: Muzzy Field Electricity Usage

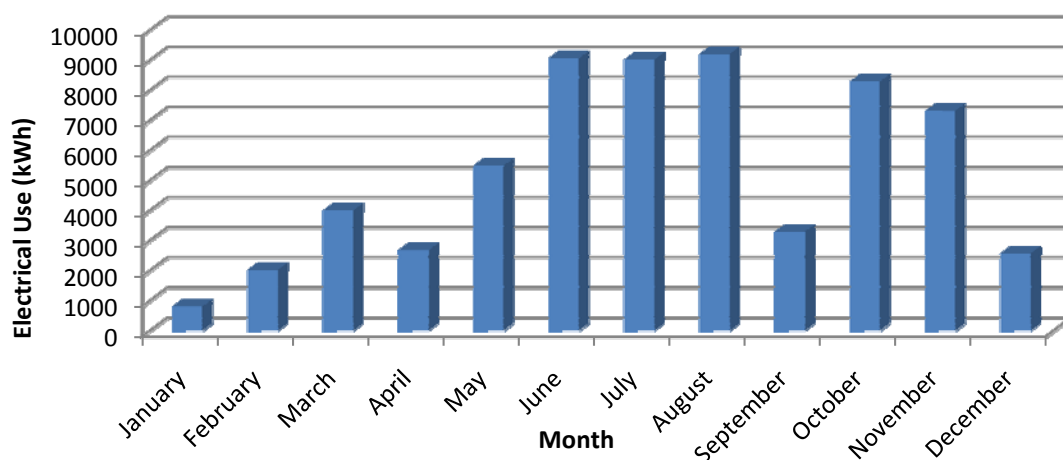


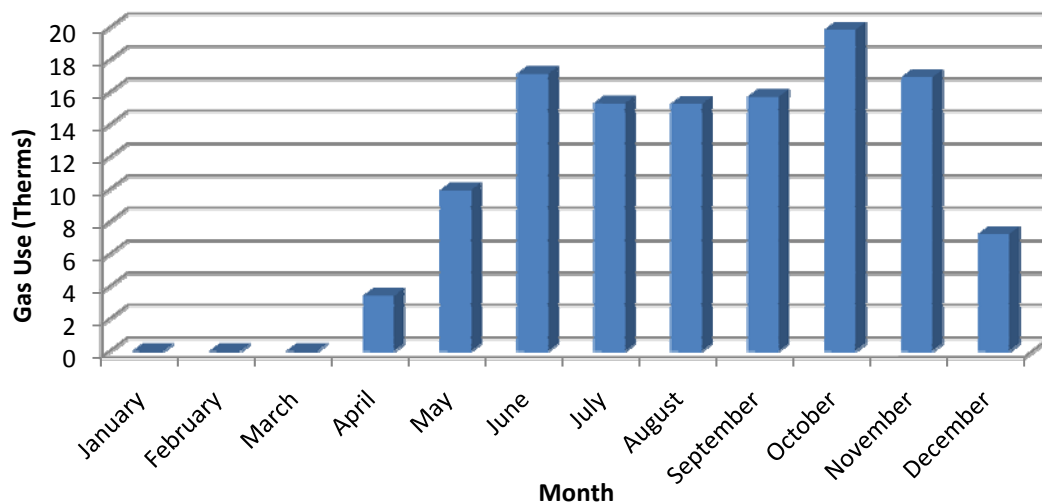
Table 3.5-4: Muzzy Field Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	210.7
Winter	221.3

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.5-7 illustrates the monthly average natural gas consumption at Muzzy Field from August 2008 through July 2010.

Figure 3.5-7: Muzzy Field Gas Usage



3.5.5 Ski Lodge

Figure 3.5-8 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Ski Lodge is approximately, 130 kWh /month.

Table 3.5-5 illustrates the seasonal peak demand loads for the Ski Lodge from April 2009 through August 2010.

Figure 3.5-8: Ski Lodge Electricity Usage

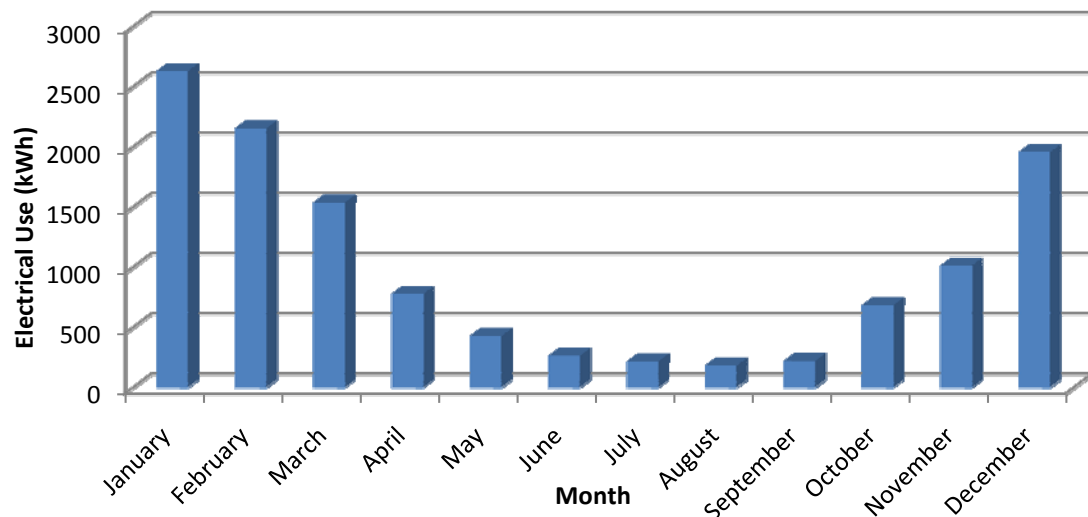


Table 3.5-5: Ski Lodge Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	4.4
Winter	10.8

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.5.6 Page Park Pavilion

Figure 3.5-9 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Page Park Pavilion is approximately, 80 kWh /month.

Table 3.5-6 illustrates the seasonal peak demand loads for the Page Park Pavilion from April 2009 through August 2010.

Figure 3.5-9: Page Park Pavilion Electricity Usage

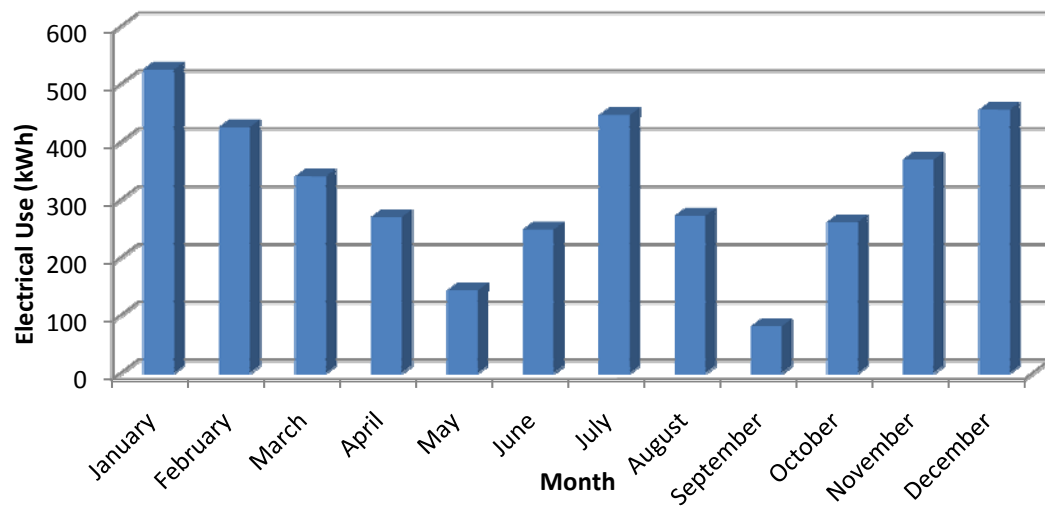


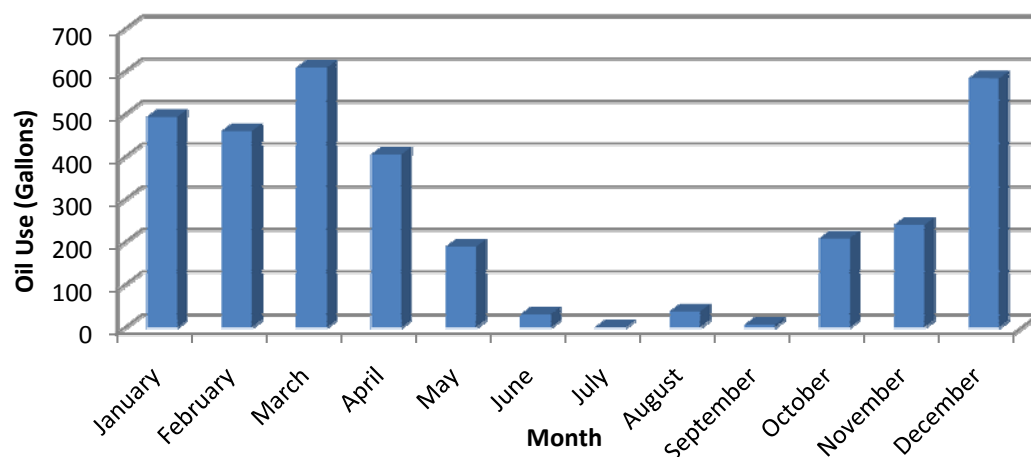
Table 3.5-6: Page Park Pavilion Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	6.2
Winter	5.6

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.5-10 illustrates the monthly average oil consumption at Page Park Pavilion from January 2007 through May 2010.

Figure 3.5-10: Page Park Pavilion Oil Usage



3.5.7 Recreation Building

Figure 3.5-11 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Recreation Building is approximately, 20 kWh / month.

Table 3.5-7 illustrates the seasonal peak demand loads for the Recreation Building from April 2009 through August 2010.

Figure 3.5-11: Recreation Building Electricity Usage

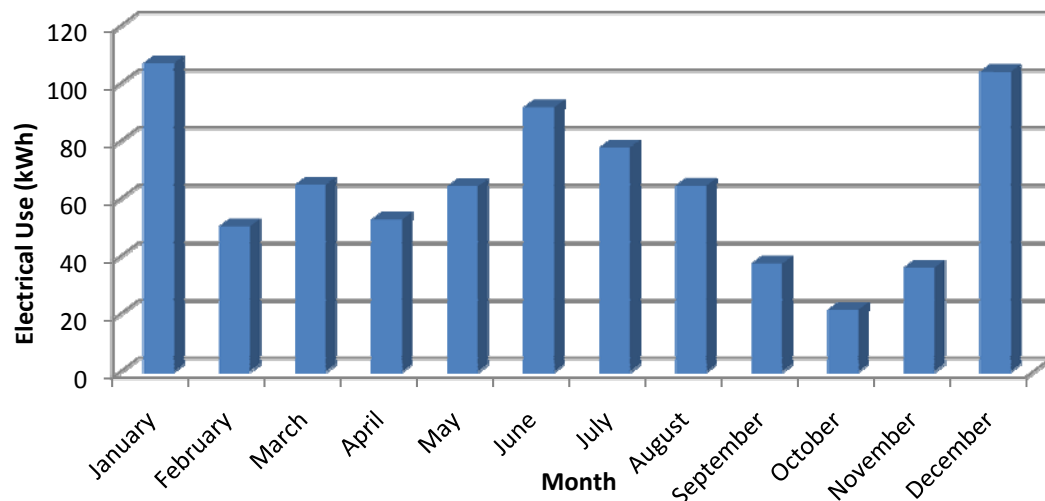


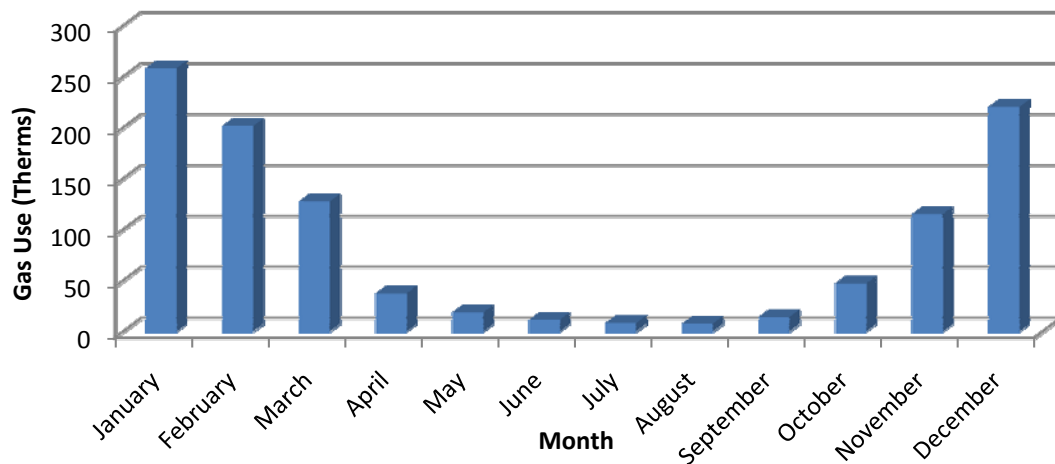
Table 3.5-7: Recreation Building Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	1.5
Winter	1.3

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.5-12 illustrates the monthly average natural gas consumption at Recreation Building from August 2008 through July 2010.

Figure 3.5-12: Recreation Building Gas Usage



3.6 Fire Departments

3.6.1 Fire Department Headquarters

Figure 3.6-1 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for the Headquarters is approximately, 7,500 kWh/month.

Table 3.6-1 illustrates the seasonal peak demand loads for the Dept. Headquarters from April 2009 through August 2010.

Figure 3.6-1: Fire Headquarters Electricity Usage

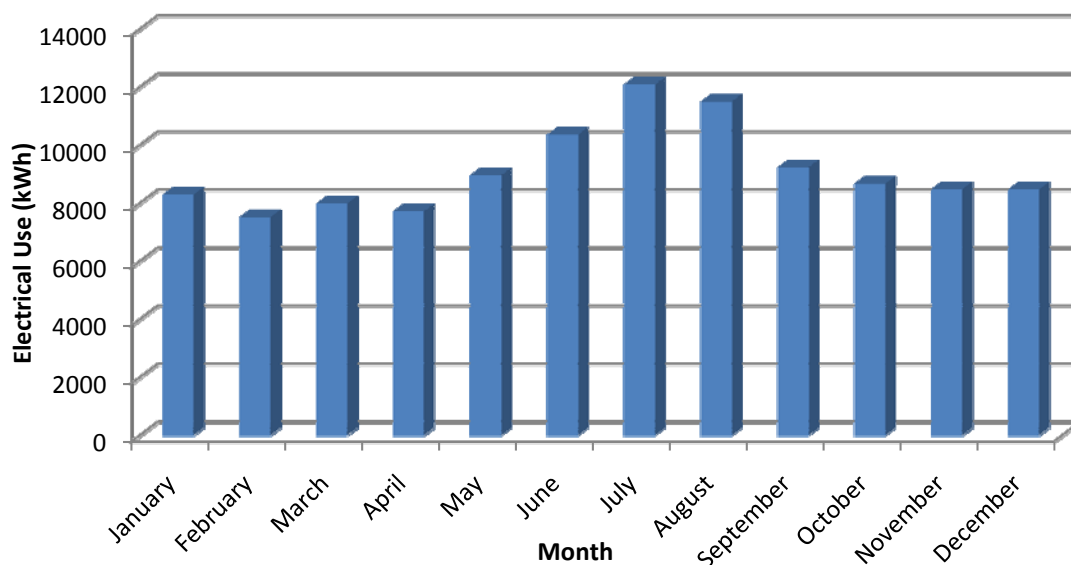


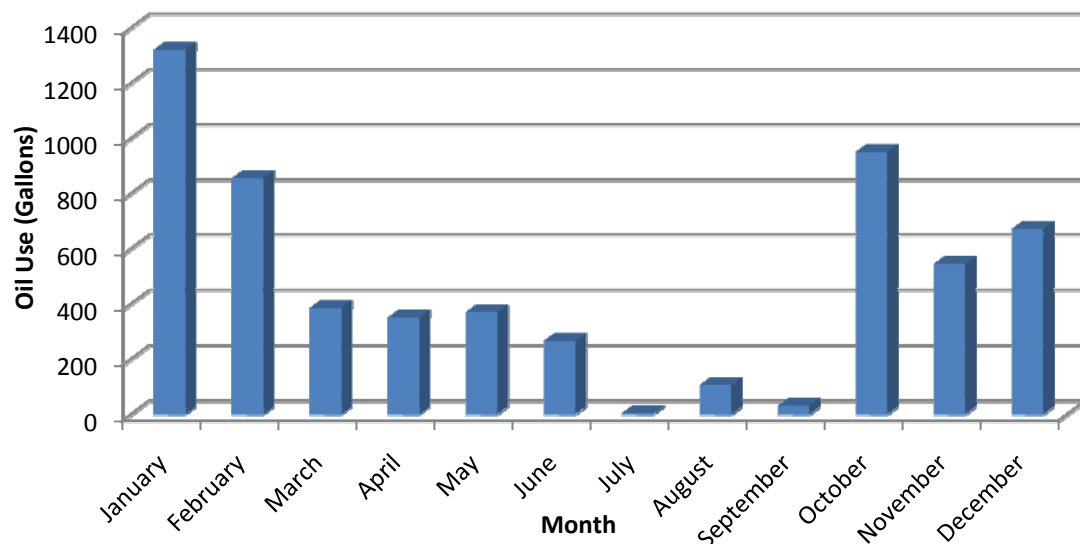
Table 3.6-1: Fire Headquarters Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	30.4
Winter	26.1

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.6 -2 illustrates the monthly average oil consumption at the Dept. Headquarters from January 2007 through April 2010.

Figure 3.6-2: Fire Headquarters Oil Usage



3.6.2 Engine Co. 2

Figure 3.6-3 illustrates the monthly total energy consumption from April 2008 through August 2009. From this graph, it can be determined that the baseline electrical consumption for Engine Co. 2 is approximately, 2,800 kWh/month.

Table 3.6-2 illustrates the seasonal peak demand loads for the Engine Co. 2 from April 2008 through August 2009.

Figure 3.6-3: Engine Co. 2 Electricity Usage

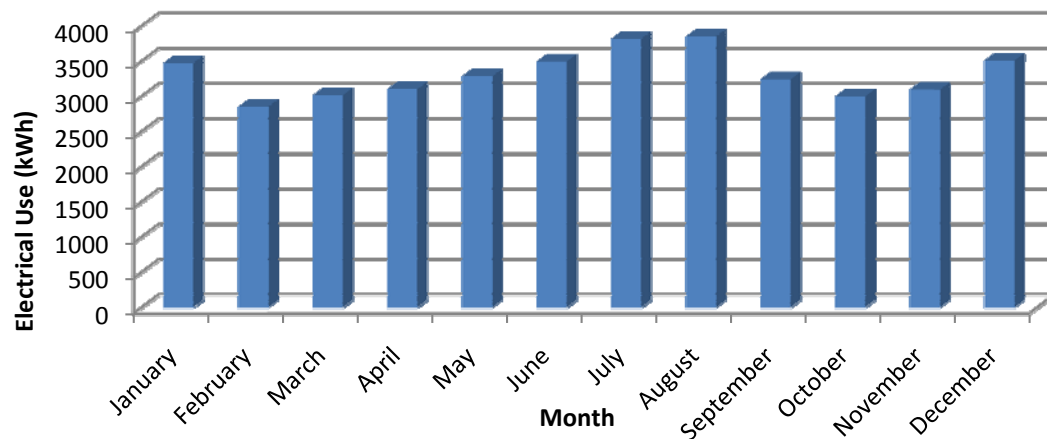


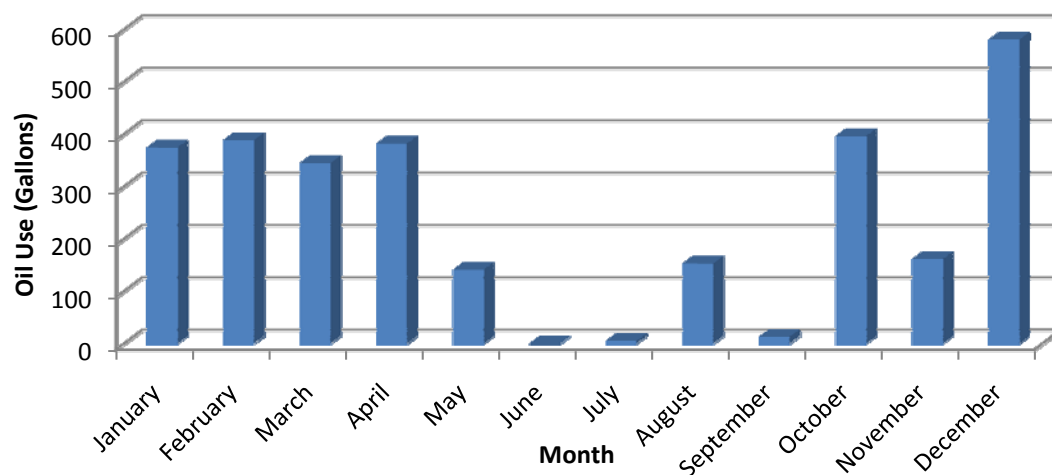
Table 3.6-2: Engine Co. 2 Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	20.9
Winter	15.1

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.6-4 illustrates the monthly average oil consumption at Engine Co. 2 from January 2007 through April 2010.

Figure 3.6-4: Engine Co. 2 Oil Usage



3.6.3 Engine Co. 3

Figure 3.6-5 illustrates the monthly total energy consumption from April 2008 through August 2009. From this graph, it can be determined that the baseline electrical consumption for Engine Co. 3 is approximately, 1,400 kWh/month.

Table 3.6-3 illustrates the seasonal peak demand loads for the Engine Co. 3 from April 2008 through August 2009.

Figure 3.6-5: Engine Co. 3 Electricity Usage

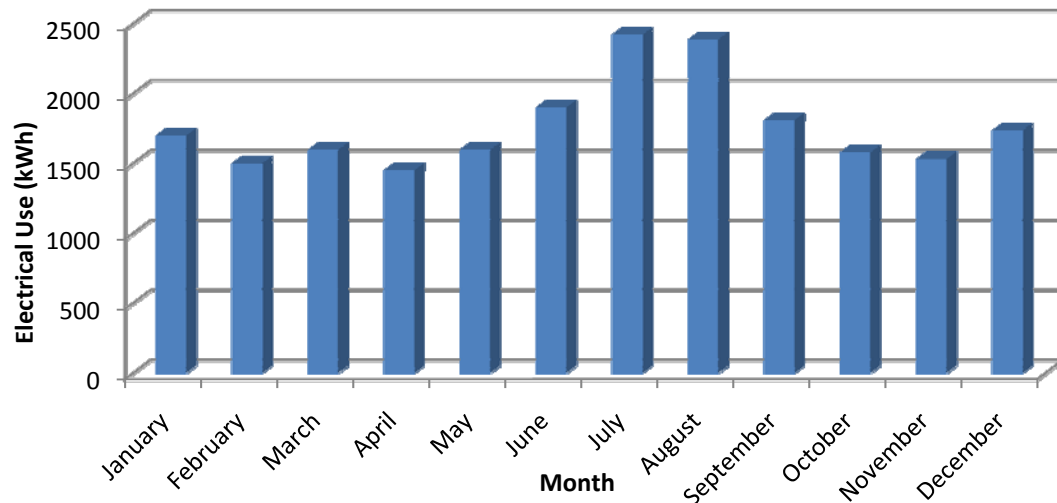


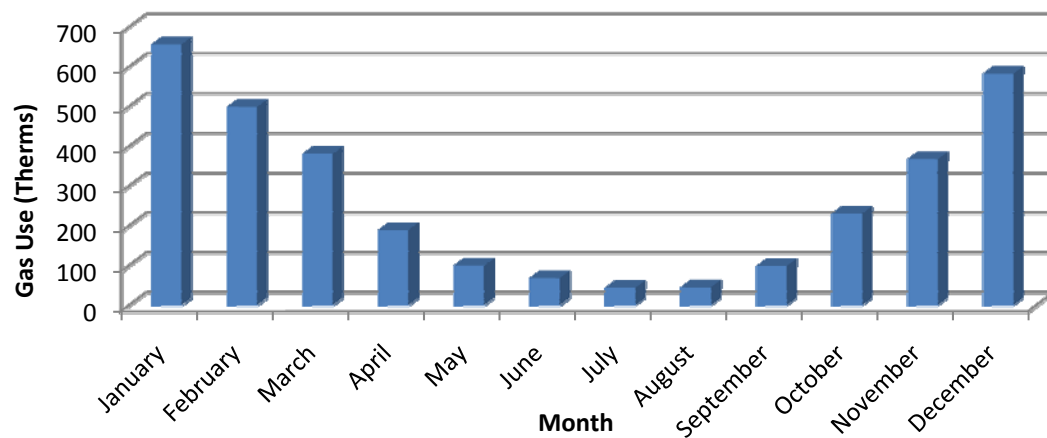
Table 3.6-3: Engine Co. 3 Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	8.8
Winter	9.1

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.6-6 illustrates the monthly average natural gas consumption at Engine Co. 3 from August 2008 through July 2010.

Figure 3.6-6: Engine Co. 3 Gas Usage



3.6.4 Engine Co. 4

Figure 3.6-7 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Engine Co. 4 is approximately, 2,100 kWh/month.

Table 3.6-4 illustrates the seasonal peak demand loads for the Engine Co. 4 from April 2009 through August 2010

Figure 3.6-7: Engine Co. 4 Electricity Usage

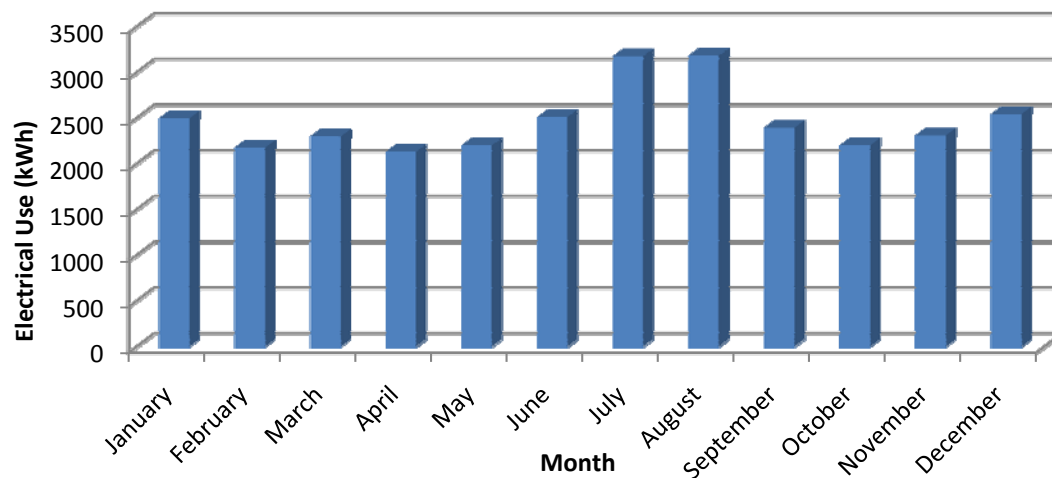


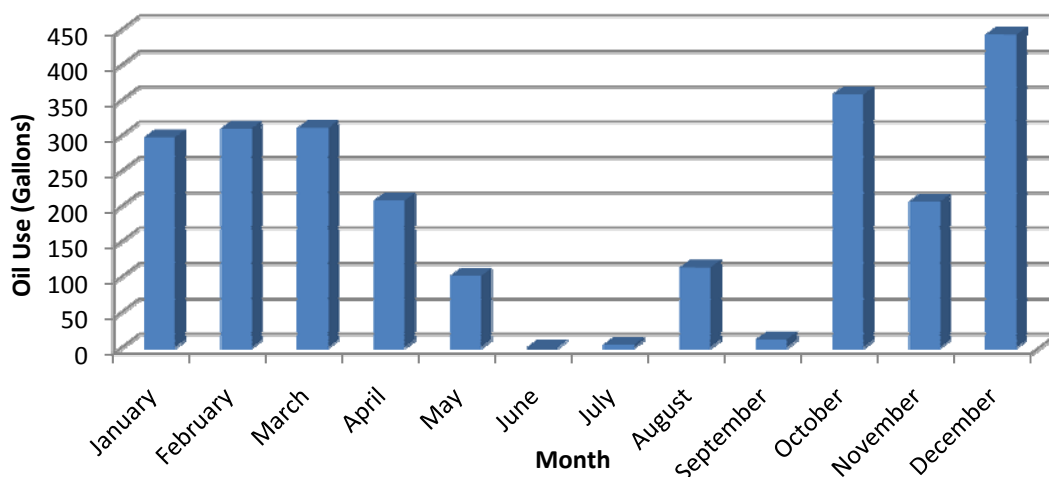
Table 3.6-4: Engine Co. 4 Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	11.4
Winter	10.7

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.6-8 illustrates the monthly average oil consumption at Engine Co. 2 from January 2007 through April 2010.

Figure 3.6-8: Engine Co. 4 Oil Usage



3.6.5 Engine Co. 5

Figure 3.6-9 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Engine Co. 5 is approximately, 1,800 kWh/month.

Table 3.6-5 illustrates the seasonal peak demand loads for the Engine Co. 5 from April 2009 through August 2010.

Figure 3.6-9: Engine Co. 5 Electricity Usage

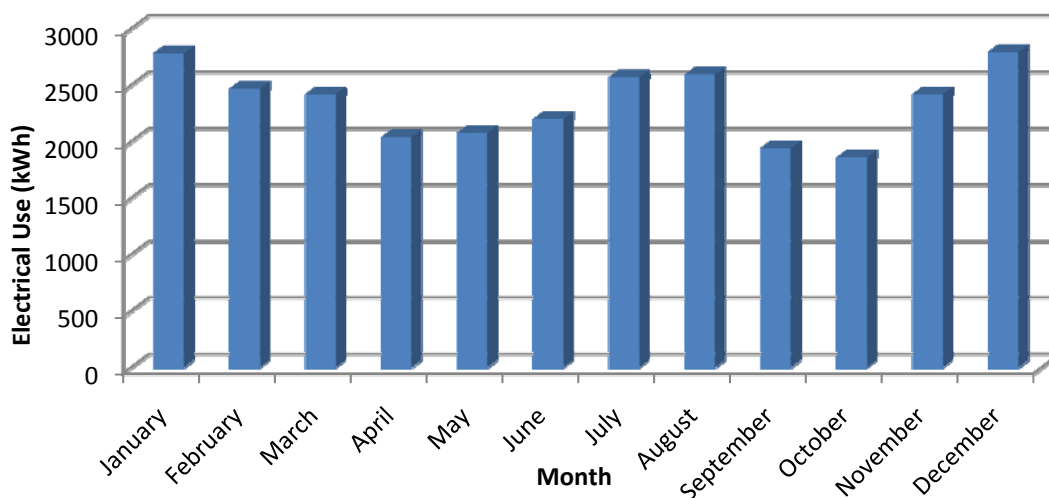


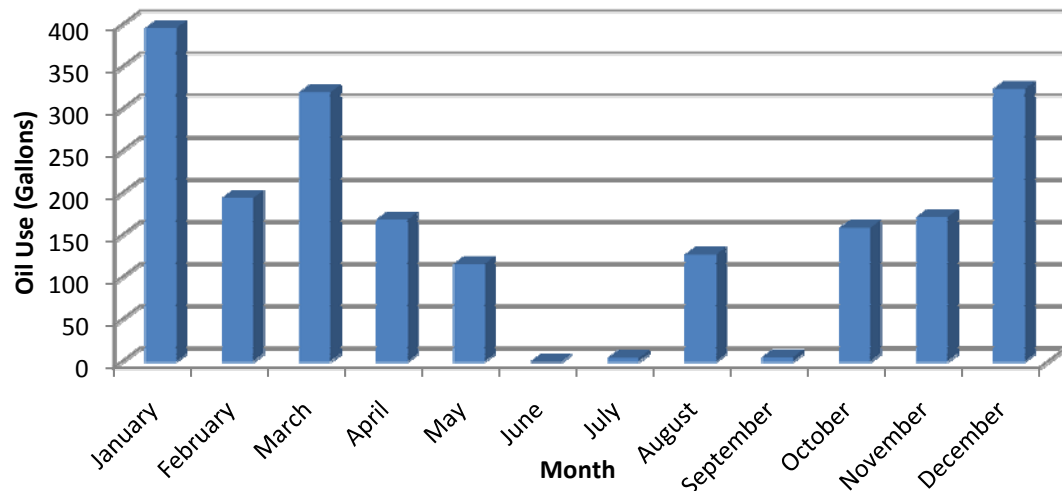
Table 3.6-5: Engine Co. 5 Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	11.4
Winter	13.9

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.6-10 illustrates the monthly average oil consumption at Engine Co. 5 from January 2007 through May 2010.

Figure 3.6-10: Engine Co. 5 Oil Usage



3.7 Senior Center

3.7.1 Senior Center

Figure 3.7-1 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Senior Center is approximately, 22,000 kWh/month.

Table 3.7-1 illustrates the seasonal peak demand loads for the Senior Center from April 2009 through August 2010.

Figure 3.7-1: Senior Center Electricity Usage

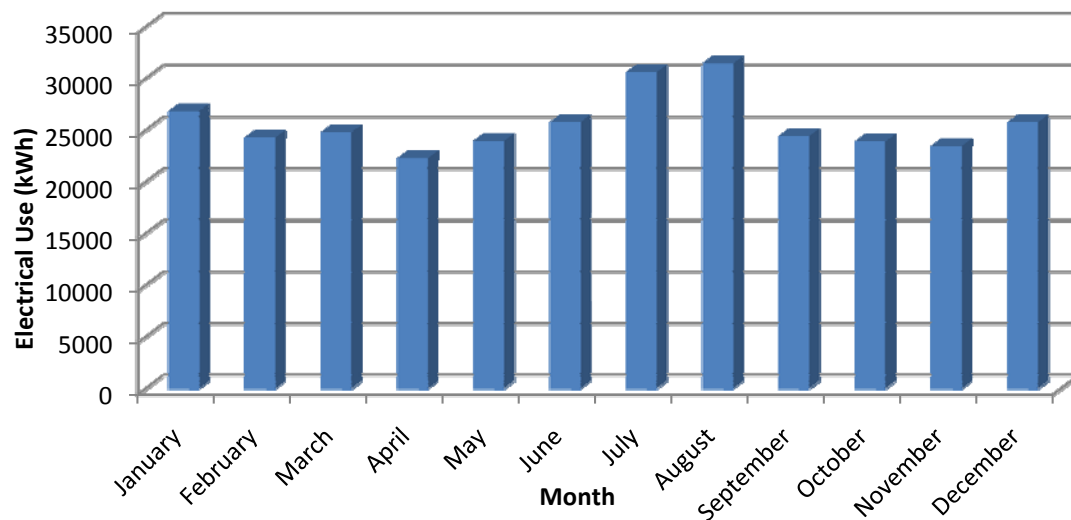


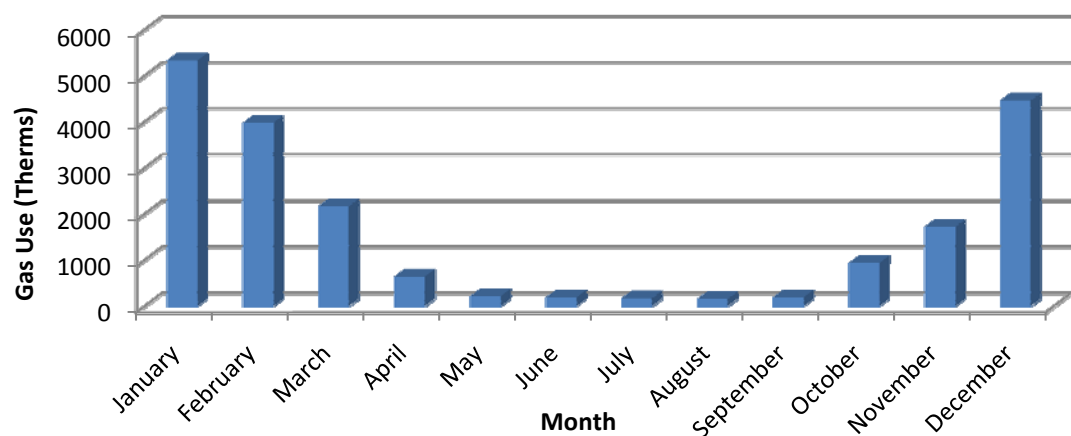
Table 3.7-1: Senior Center Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	133
Winter	92

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.7-2 illustrates the monthly average natural gas consumption at Senior Center from August 2008 through July 2010.

Figure 3.7-2: Senior Center Gas Usage



3.8 Libraries

3.8.1 Main Library

Figure 3.8-1 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Main Library is approximately, 39,000 kWh/month.

Table 3.8-1 illustrates the seasonal peak demand loads for the Main Library from April 2009 through August 2010.

Figure 3.8-1: Main Library Electricity Usage

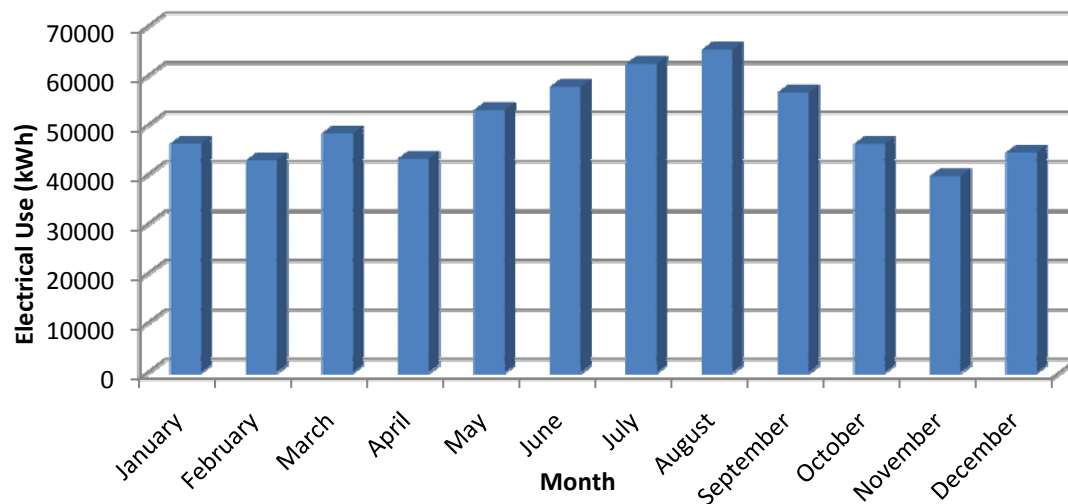


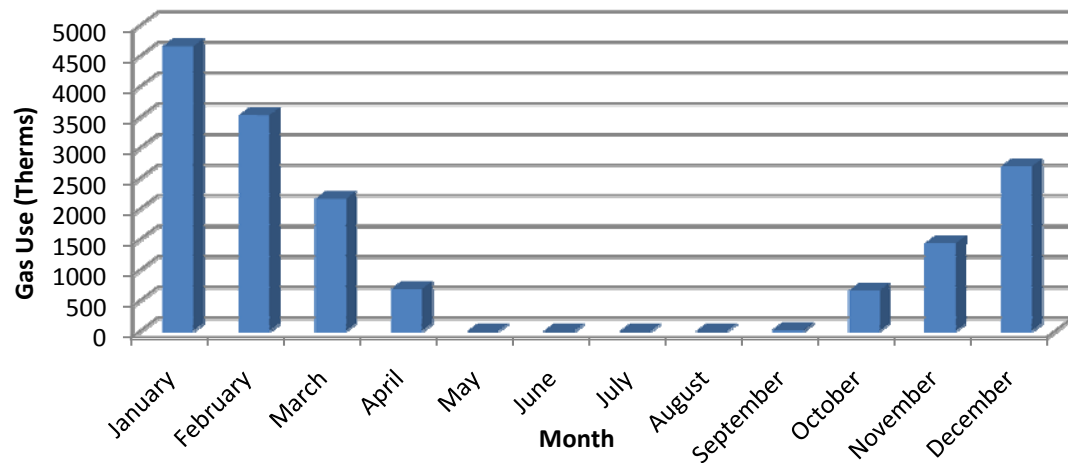
Table 3.8-1: Main Library Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	206
Winter	129

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.8-2 illustrates the monthly average natural gas consumption at Main Library from March 2008 through December 2009.

Figure 3.8-2: Main Library Gas Usage



3.8.2 Public Library

Figure 3.8-3 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Public Library is approximately, 8,200 kWh/month.

Table 3.8-2 illustrates the seasonal peak demand loads for the Public Library from April 2009 through August 2010.

Figure 3.8-3: Public Library Electricity Usage

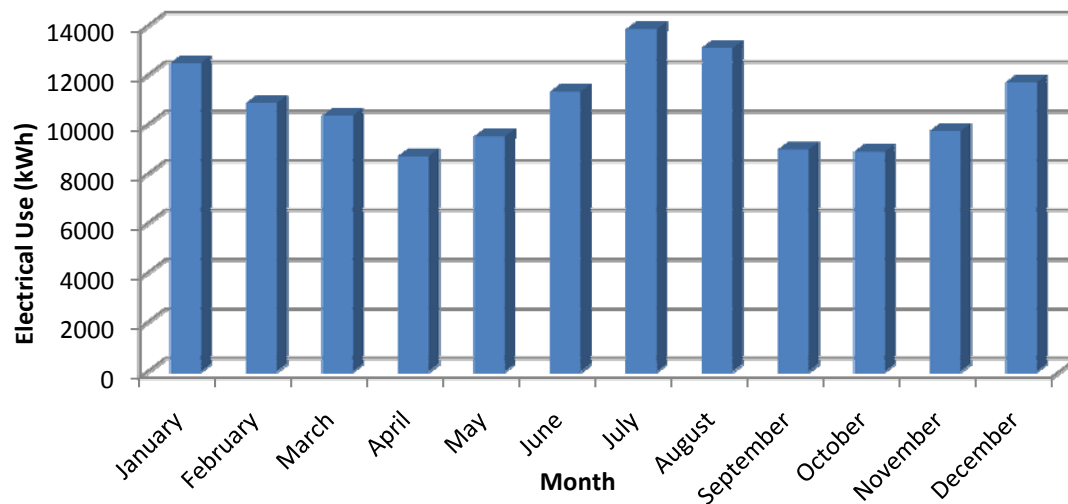


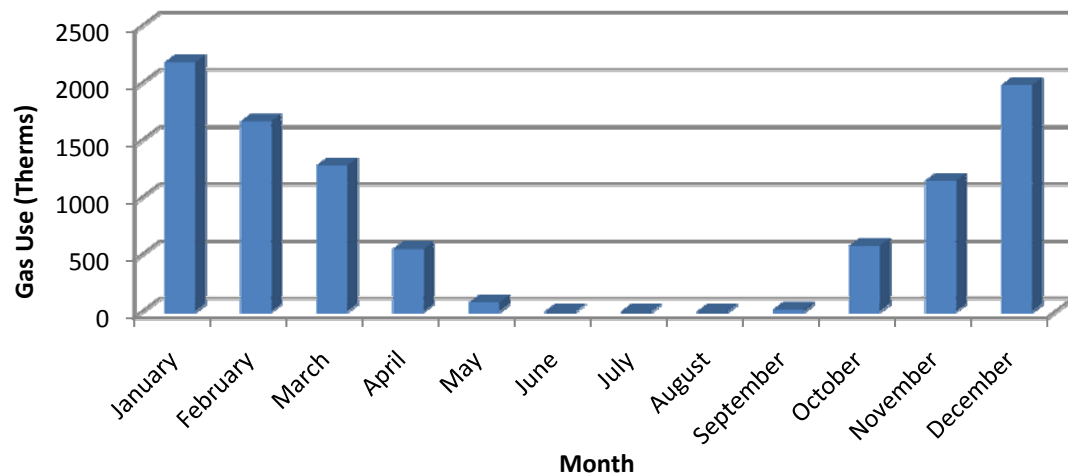
Table 3.8-2: Public Library Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	69.4
Winter	32.5

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.8-4 illustrates the monthly average natural gas consumption at Public Library from August 2008 through May 2010.

Figure 3.8-4: Public Library Gas Usage



3.9 Youth Services

3.9.1 Youth Services

Figure 3.9-1 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Youth Services is approximately, 2,300 kWh/month.

Table 3.9-1 illustrates the seasonal peak demand loads for the Youth Services from April 2009 through August 2010.

Figure 3.9-1: Youth Services Electricity Usage

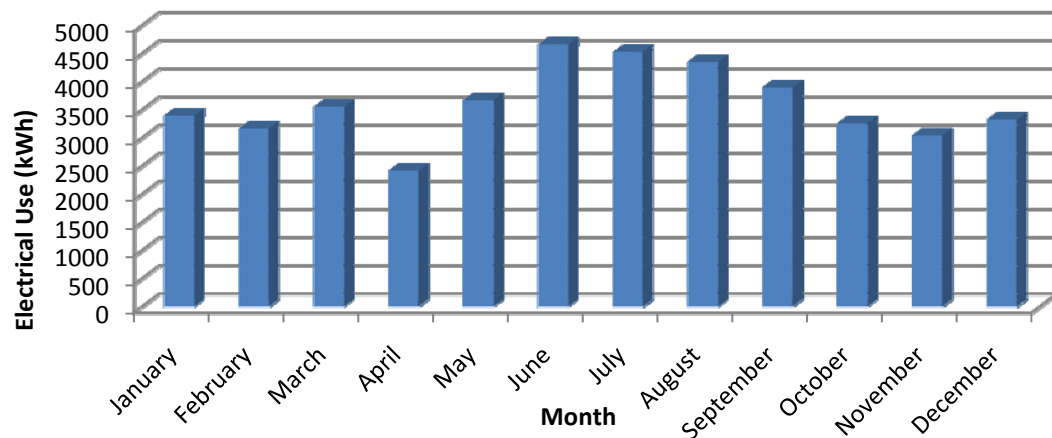


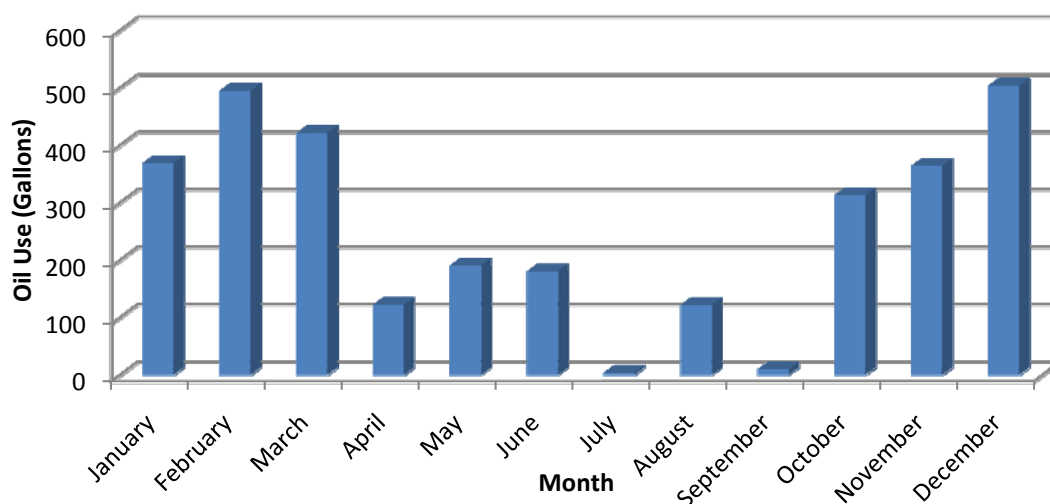
Table 3.9-1: Youth Services Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	19.2
Winter	12.8

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.9-2 illustrates the monthly average oil consumption at Youth Services from January 2007 through May 2010.

Figure 3.9-2: Youth Services Oil Usage



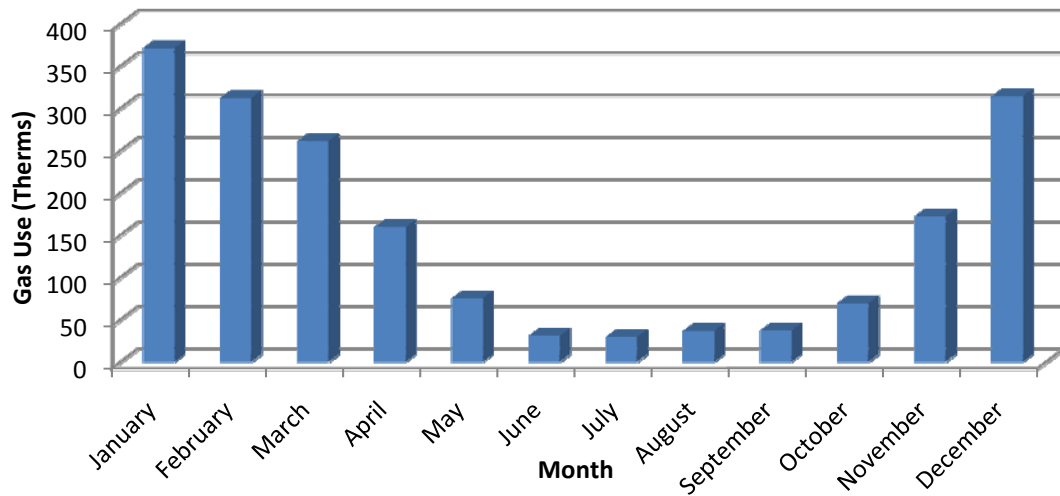
3.10 Public Works

3.10.1 Animal Control

Electric power for Animal Control is fed from one General Service Secondary three phase line. Monthly electrical data for animal control was not available for use at the time of this report.

Figure 3.10-1 illustrates the monthly average natural gas consumption at Animal Control from August 2008 through July 2009.

Figure 3.10-1: Animal Control Gas Usage



3.10.2 Community Services

Figure 3.10-2 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Community Services is approximately, 0.010 kWh/month.

Table 3.10-1 illustrates the seasonal peak demand loads for the Community Services from April 2009 through August 2010.

Figure 3.10-2: Community Services Electricity Usage

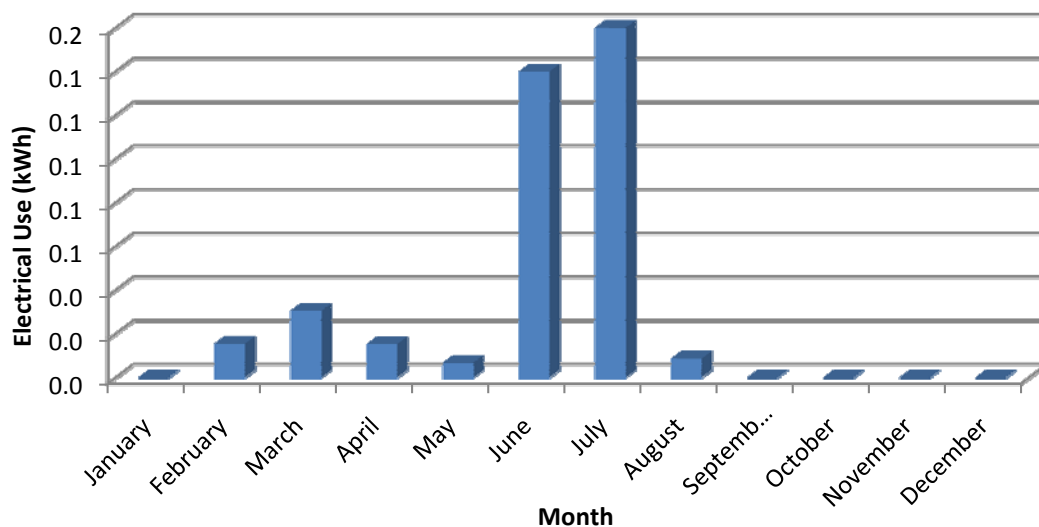


Table 3.10-1: Community Services Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	5
Winter	1

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.10.3 Hill Street

Figure 3.10-3 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Hill Street is approximately, 34 kWh/month.

Table 3.10-2 illustrates the seasonal peak demand loads for the Hill Street from April 2009 through August 2010.

Figure 3.10-3: Hill Street Electricity Usage

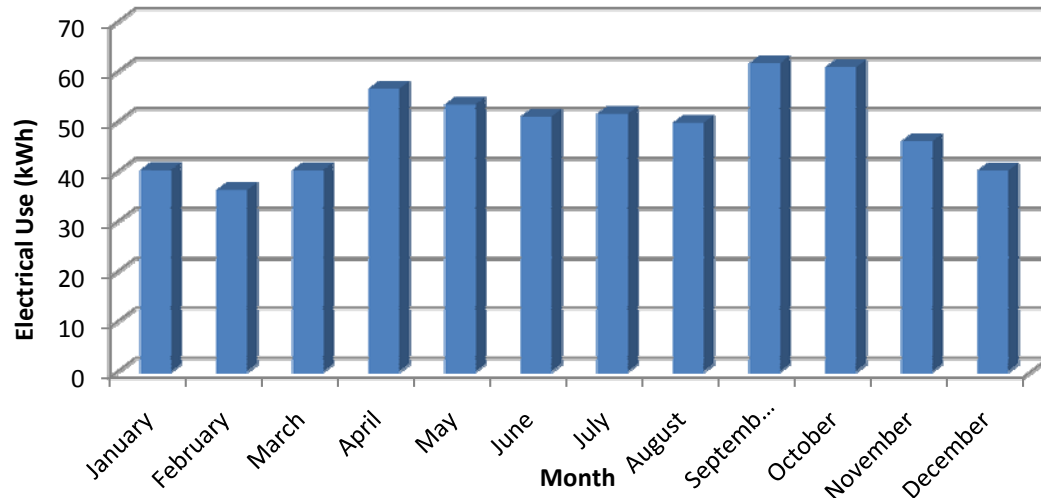


Table 3.10-2: Hill Street Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	1.0
Winter	0.9

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.10.4 City Yard

Figure 3.10-4 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for City Yard is approximately, 7,500 kWh/month.

Table 3.10-3 illustrates the seasonal peak demand loads for the City Yard from April 2009 through August 2010.

Figure 3.10-4: City Yard Electricity Usage

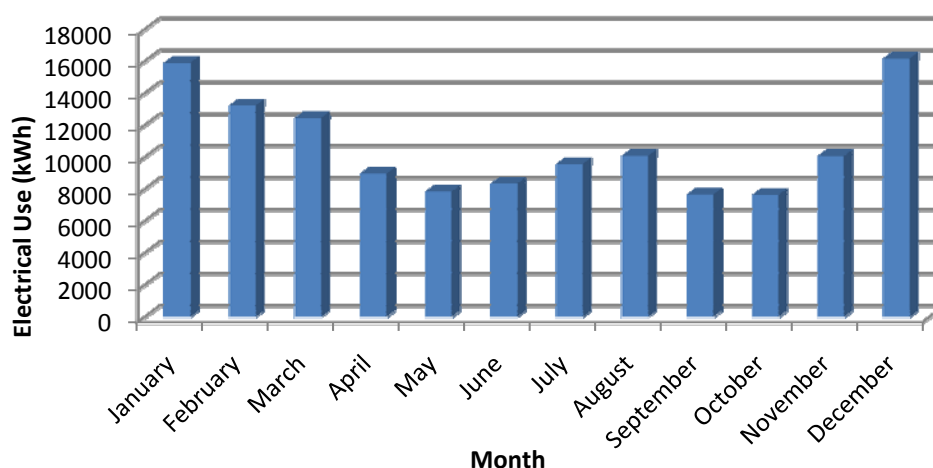


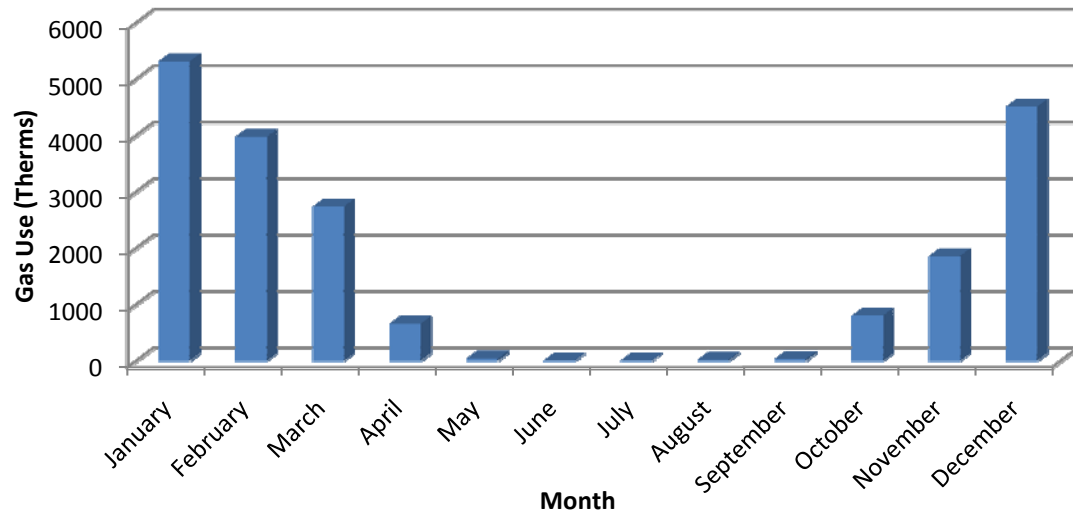
Table 3.10-3: City Yard Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	30
Winter	33

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.10-5 illustrates the monthly average natural gas consumption at City Yard from August 2008 through May 2010.

Figure 3.10-5: City Yard Gas Usage



3.10.5 Transfer Station Small

Figure 3.10-6 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Transfer Station Small is approximately, 750 kWh/month.

Table 3.10-4 illustrates the seasonal peak demand loads for the Transfer Station Small from April 2009 through August 2010.

Figure 3.10-6: Transfer Station Small Electricity Usage

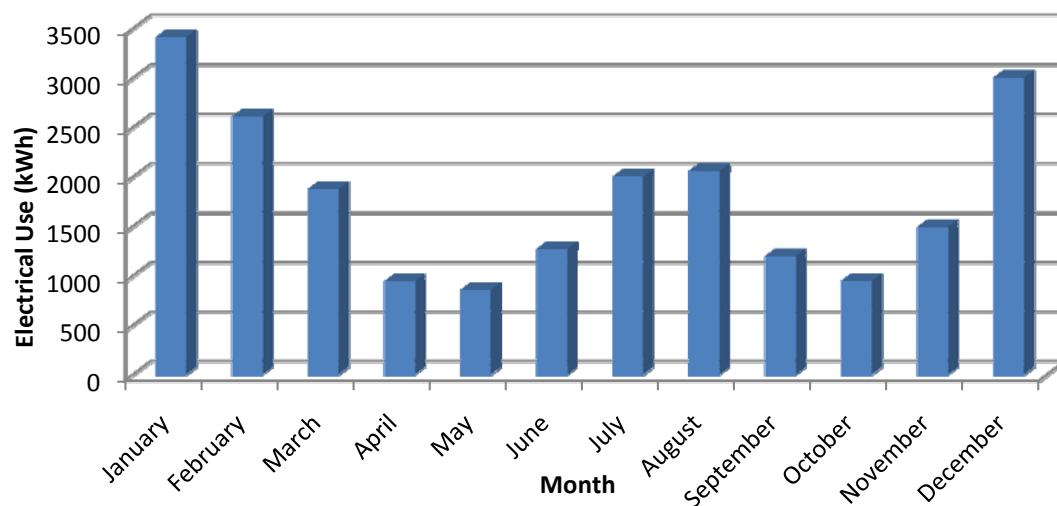


Table 3.10-4: Transfer Station Small Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	7.5
Winter	12.3

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.10.6 Transfer Station Hut

Figure 3.10-7 illustrates the monthly total energy consumption from March 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Transfer Station Hut is approximately, 148 kWh/month.

Table 3.10-5 illustrates the seasonal peak demand loads for the Transfer Station Hut from March 2009 through August 2010. The information present is only as recent as the most recent bill received.

Figure 3.10-7: Transfer Station Hut Electricity Usage

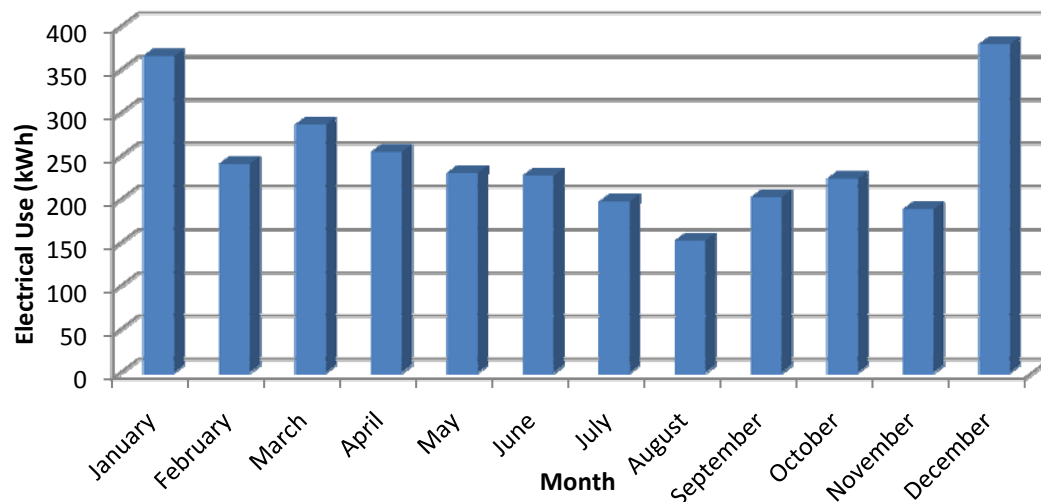


Table 3.10-5: Transfer Station Hut Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	2.7
Winter	3.8

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11 Water Pollution Control

3.11.1 Water Pollution Control Facility

Figure 3.11-1 illustrates the monthly total energy consumption from April 2009 through July 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control Facility is approximately, 250,000 kWh/month.

Table 3.11-1 illustrates the seasonal peak demand loads for the Water Pollution Control Facility from April 2009 through July 2010.

Figure 3.11-1: Water Pollution Control Facility Electricity Usage

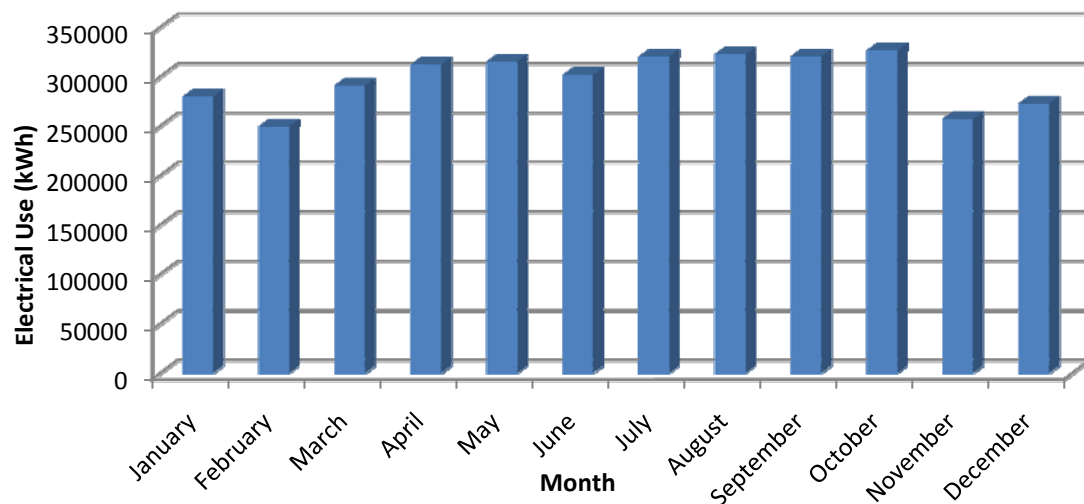


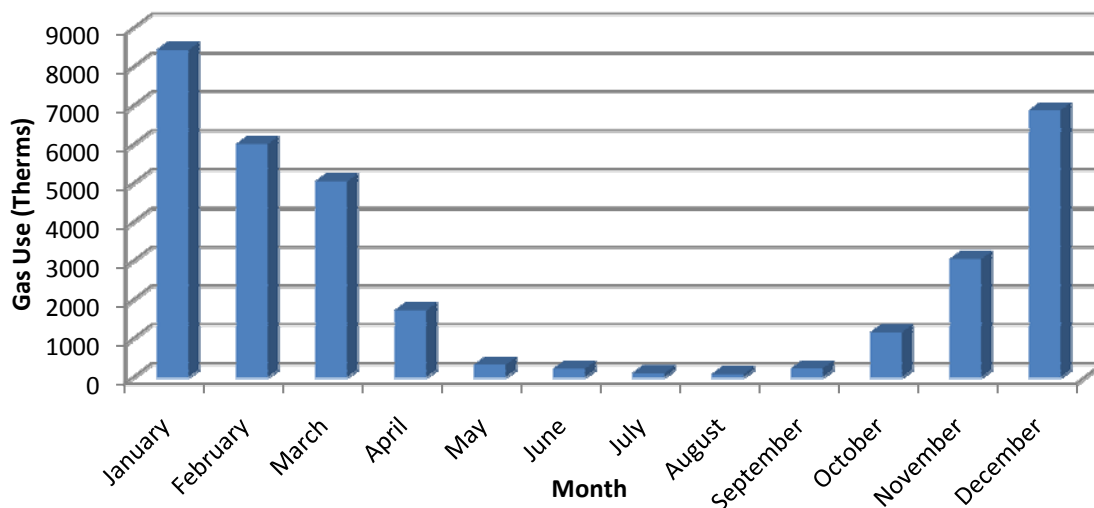
Table 3.11-1: Water Pollution Control Facility Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	680
Winter	637

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

Figure 3.11-2 illustrates the monthly average natural gas consumption at Water Pollution Control Facility from August 2008 through July 2010.

Figure 3.11-2: Water Pollution Control Facility Gas Usage



3.11.2 Water Pollution Control - Boivin St. Pump Station

Figure 3.11-3 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control - Boivin is approximately, 1,500 kWh/month.

Table 3.11-2 illustrates the seasonal peak demand loads for the Water Pollution Control - Boivin from April 2009 through August 2010.

Figure 3.11-3: Water Pollution Control - Boivin St. PS Electricity Usage

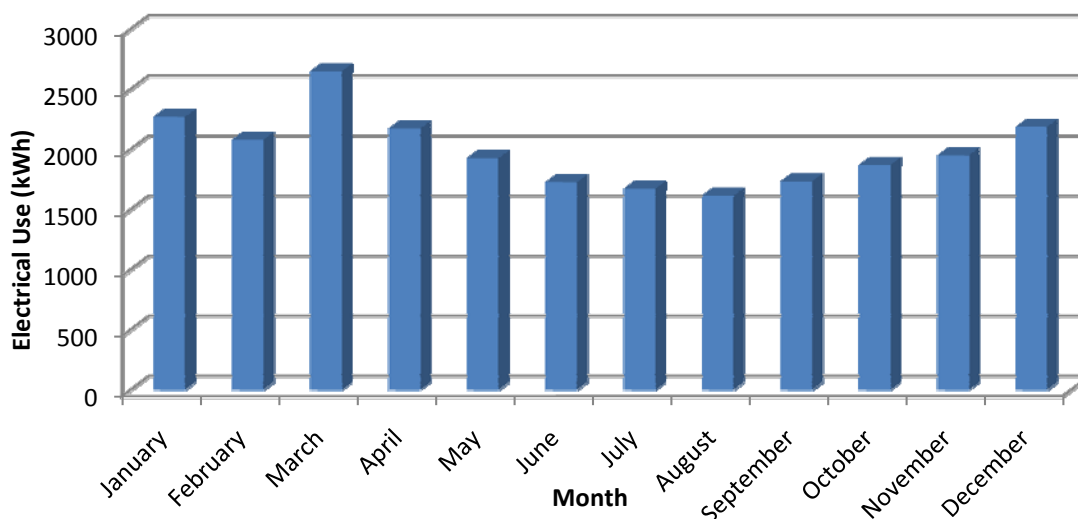


Table 3.11-2: Water Pollution Control - Boivin Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	9.7
Winter	6.7

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11.3 Water Pollution Control – Broad St. Pump Station

Figure 3.11-4 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control - Broad is approximately, 63,000 kWh/month.

Table 3.11-3 illustrates the seasonal peak demand loads for the Water Pollution Control - Broad from April 2009 through August 2010.

Figure 3.11-4: Water Pollution Control -Broad Electricity Usage

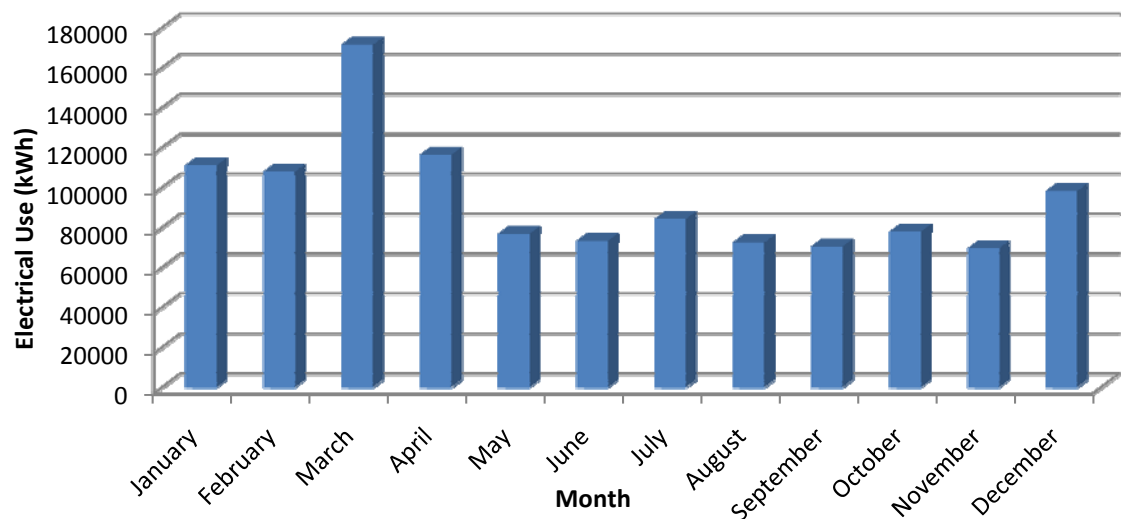


Table 3.11-3: Water Pollution Control - Broad Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	288
Winter	527

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11.4 Water Pollution Control - Cherry Hill Pump Station

Figure 3.11-5 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control - Cherry Hill is approximately, 650 kWh/month.

Table 3.11-4 illustrates the seasonal peak demand loads for the Water Pollution Control - Cherry Hill from April 2009 through August 2010.

Figure 3.11-5: Water Pollution Control - Cherry Hill Electricity Usage

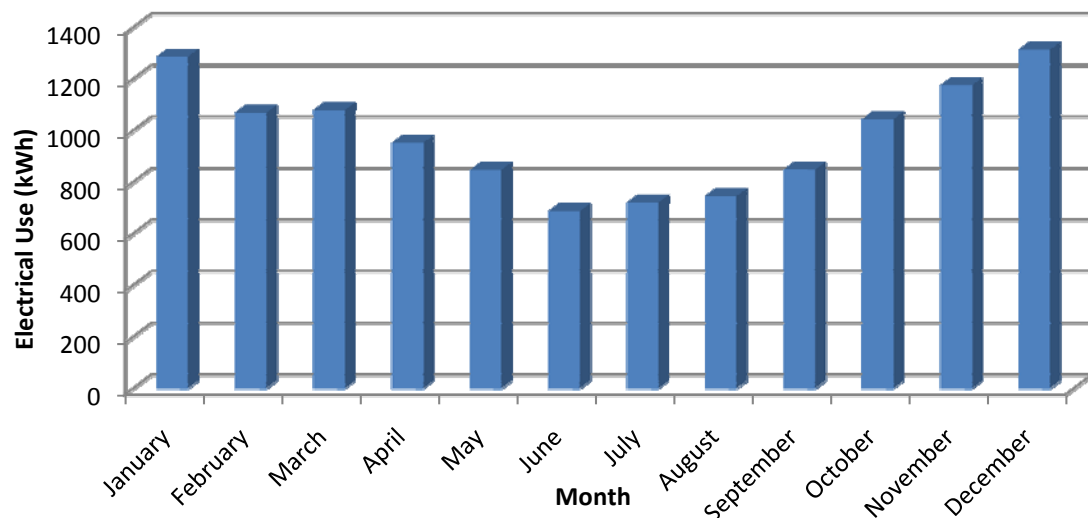


Table 3.11-4: Water Pollution Control - Cherry Hill Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	6.7
Winter	8.7

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11.5 Water Pollution Control - Cross St. Pump Station

Figure 3.11-6 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline

electrical consumption for Water Pollution Control - Cross is approximately, 4,200 kWh/month.

Table 3.11-5 illustrates the seasonal peak demand loads for the Water Pollution Control - Cross from April 2009 through August 2010.

Figure 3.11-6: Water Pollution Control - Cross Electricity Usage

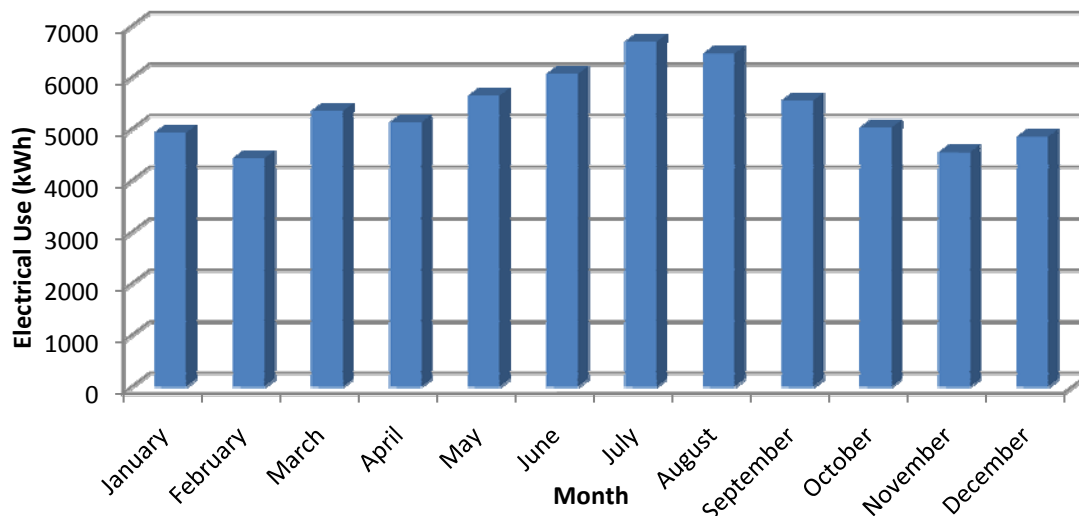


Table 3.11-5: Water Pollution Control – Cross Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	29.5
Winter	26.5

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11.6 Water Pollution Control – Drayla St. Pump Station

Figure 3.11-7 illustrates the monthly total energy consumption from May 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control - Drayla is approximately, 30 kWh/month.

Table 3.11-6 illustrates the seasonal peak demand loads for the Water Pollution Control - Drayla from May 2009 through August 2010.

Figure 3.11-7: Water Pollution Control Drayla Electricity Usage

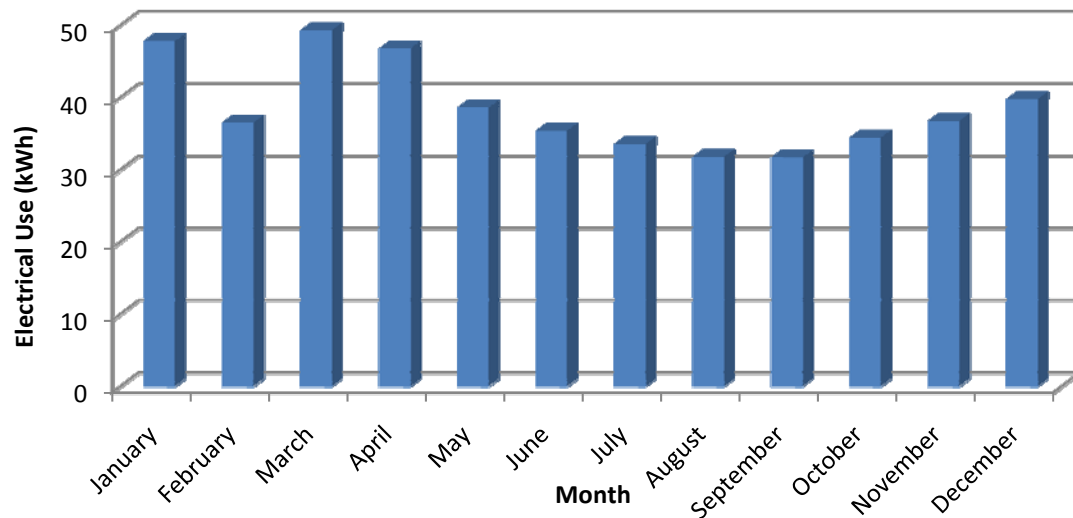


Table 3.11-6: Water Pollution Control - Drayla Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	1.7
Winter	2.2

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11.7 Water Pollution Control - East Main St. Pump Station

Figure 3.11-8 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control - East Main is approximately, 5,000 kWh/month.

Table 3.11-7 illustrates the seasonal peak demand loads for the Water Pollution Control - East Main from April 2009 through August 2010

Figure 3.11-8: Water Pollution Control - August Electricity Usage

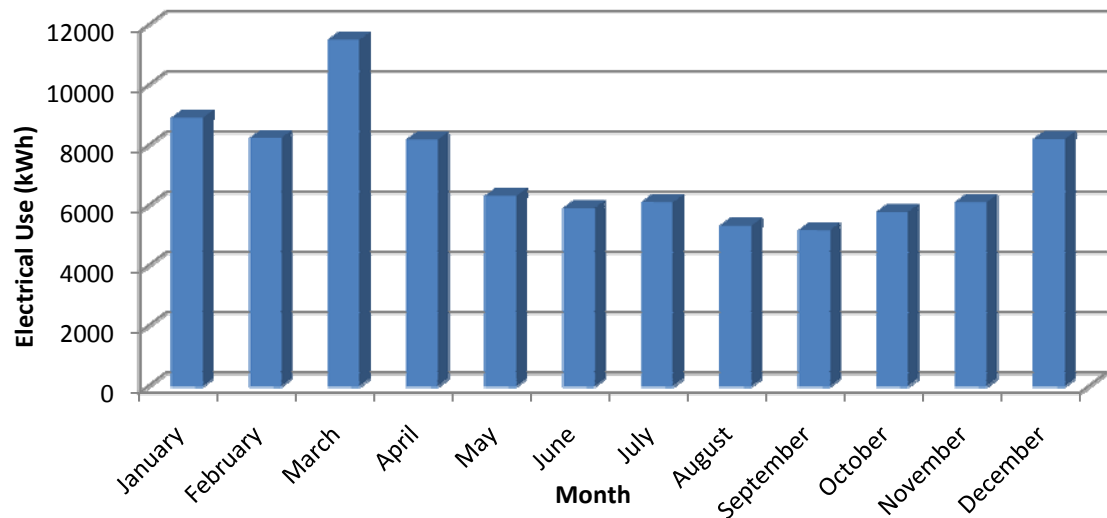


Table 3.11-7: Water Pollution Control - East Main Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	27.0
Winter	59.6

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11.8 Water Pollution Control - Ivy Pump Station

Figure 3.11-9 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control - Ivy is approximately, 780 kWh/month.

Table 3.11-8 illustrates the seasonal peak demand loads for the Water Pollution Control - Ivy from April 2009 through August 2010.

Figure 3.11-9: Water Pollution Control - Ivy Electricity Usage

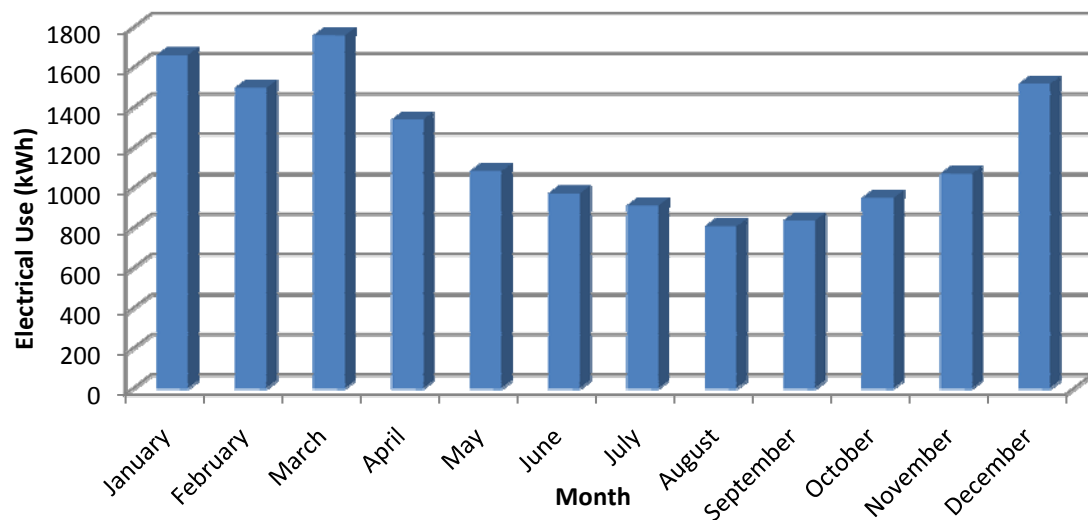


Table 3.11-8: Water Pollution Control - Ivy Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	4.9
Winter	4.7

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11.9 Water Pollution Control - Julia Pump Station

Figure 3.11-10 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control - Julia is approximately, 5,000 kWh/month.

Table 3.11-9 illustrates the seasonal peak demand loads for the Water Pollution Control - Julia from April 2009 through August 2010.

Figure 3.11-10: Water Pollution Control - Julia Electricity Usage

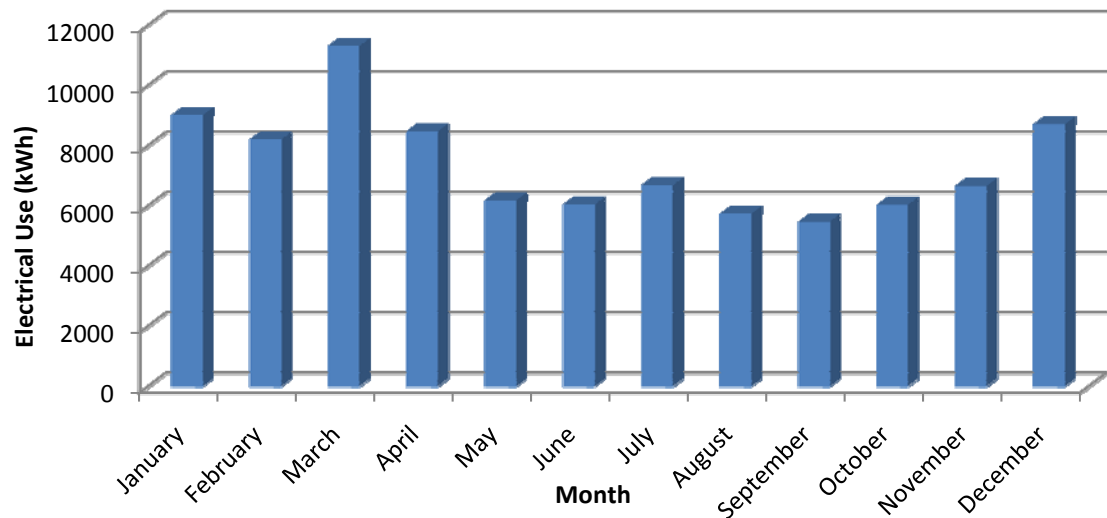


Table 3.11-9: Water Pollution Control Julia Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	23.5
Winter	55.2

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11.10 Water Pollution Control – Lake Pump Station

Figure 3.11-11 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control – Lake is approximately, 1,600 kWh/month.

Table 3.11-10 illustrates the seasonal peak demand loads for the Water Pollution Control – Lake from April 2009 through August 2010.

Figure 3.11-11: Water Pollution Control - Lake Electricity Usage

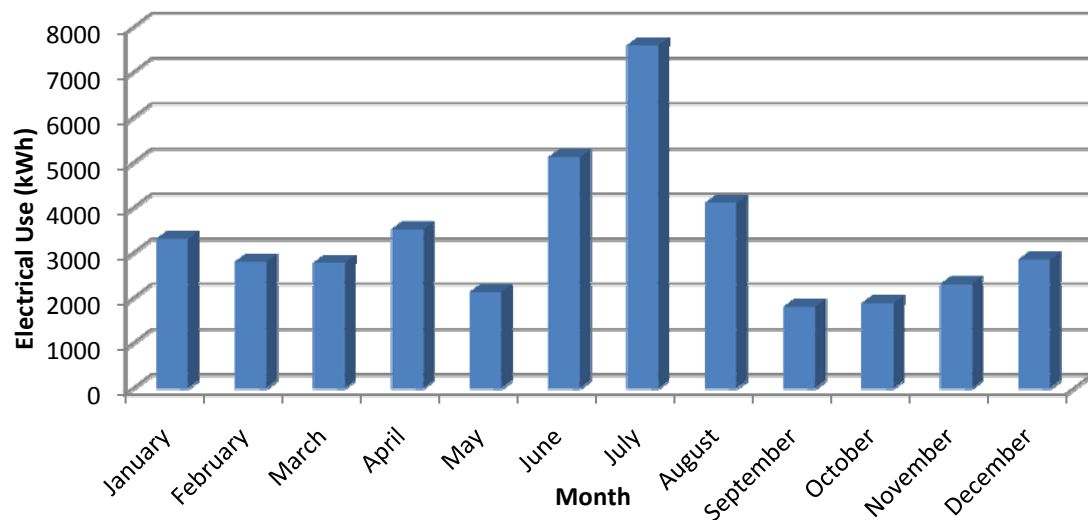


Table 3.11-10: Water Pollution Control - Lake Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	50.7
Winter	39.2

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11.11 Water Pollution Control – Lufkin Pump Station

Figure 3.11-12 illustrates the monthly total energy consumption from May 2009 through September 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control - Lufkin is approximately, 280 kWh/month.

Table 3.11-11 illustrates the seasonal peak demand loads for the Water Pollution Control - Lufkin from 2009 through September 2010.

Figure 3.11-12: Water Pollution Control - Lufkin Electricity Usage

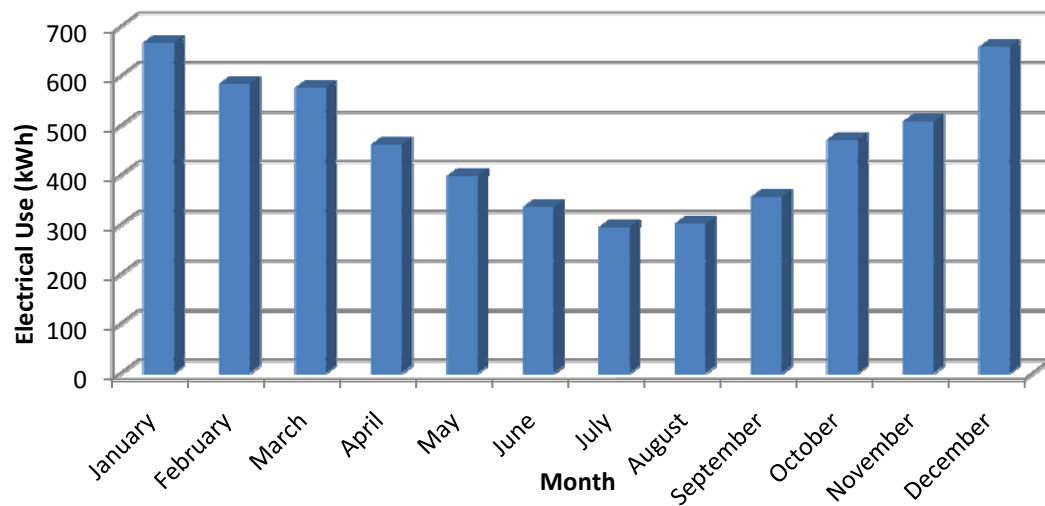


Table 3.11-11: Water Pollution Control - Lufkin Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	5.4
Winter	6.2

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11.12 Water Pollution Control – Matthews Pump Station

Figure 3.11-13 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control - Matthews is approximately, 2,400 kWh/month.

Table 3.11-12 illustrates the seasonal peak demand loads for the Water Pollution Control - Matthews from April 2009 through August 2010.

Figure 3.11-13: Water Pollution Control - Matthews Electricity Usage

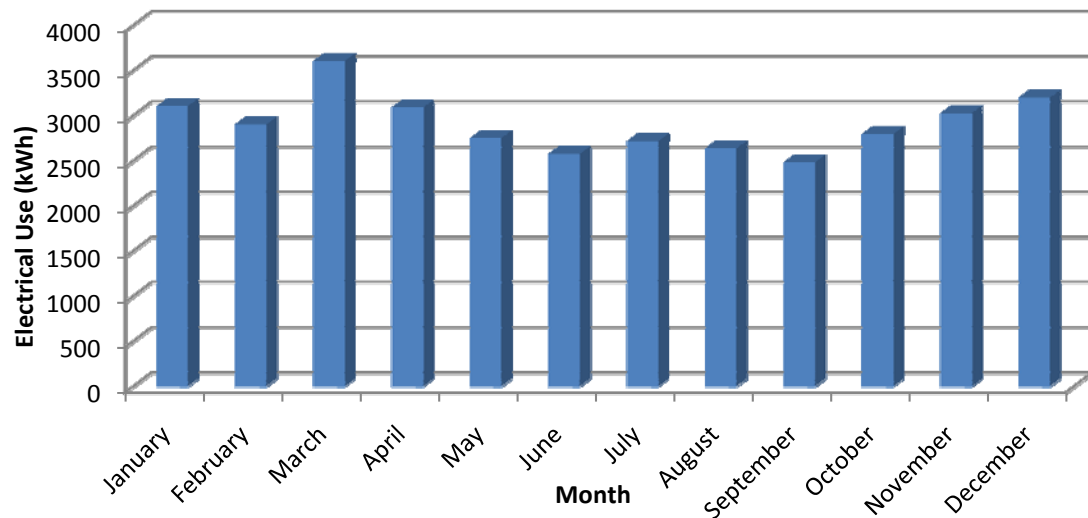


Table 3.11-12: Water Pollution Control - Matthews Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	11.7
Winter	19.0

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11.13 Water Pollution Control – Middle Pump Station

Figure 3.11-14 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control – Middle is approximately, 2,600 kWh/month.

Table 3.11-13 illustrates the seasonal peak demand loads for the Water Pollution Control – Middle from April 2009 through August 2010

Figure 3.11-14: Water Pollution Control – Middle Electricity Usage

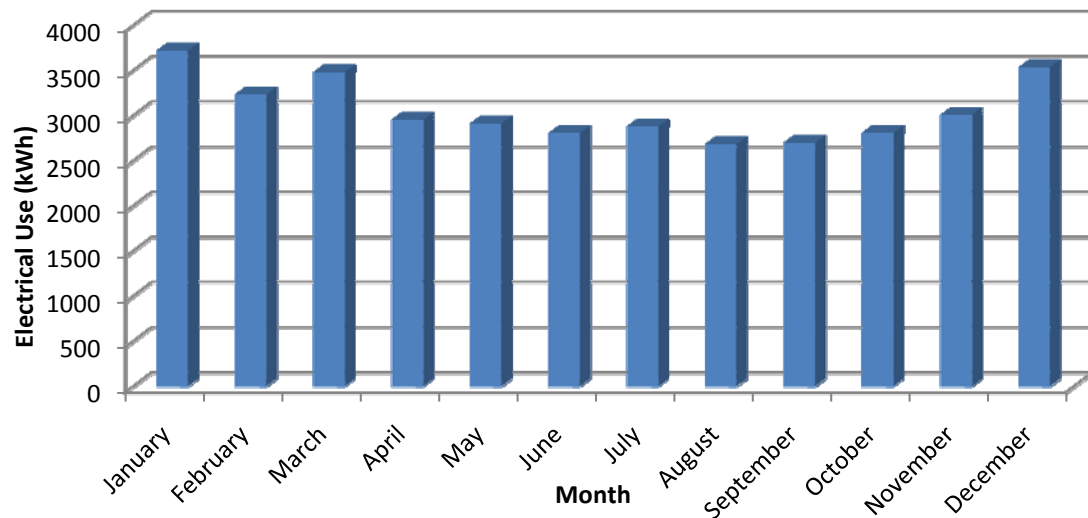


Table 3.11-13: Water Pollution Control - Middle Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	37.3
Winter	20.9

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11.14 Water Pollution Control – Minor Pump Station

Figure 3.11-15 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control - Minor is approximately, 1,700 kWh/month.

Table 3.11-14 illustrates the seasonal peak demand loads for the Water Pollution Control - Minor from April 2009 through August 2010.

Figure 3.11-15: Water Pollution Control - Minor Electricity Usage

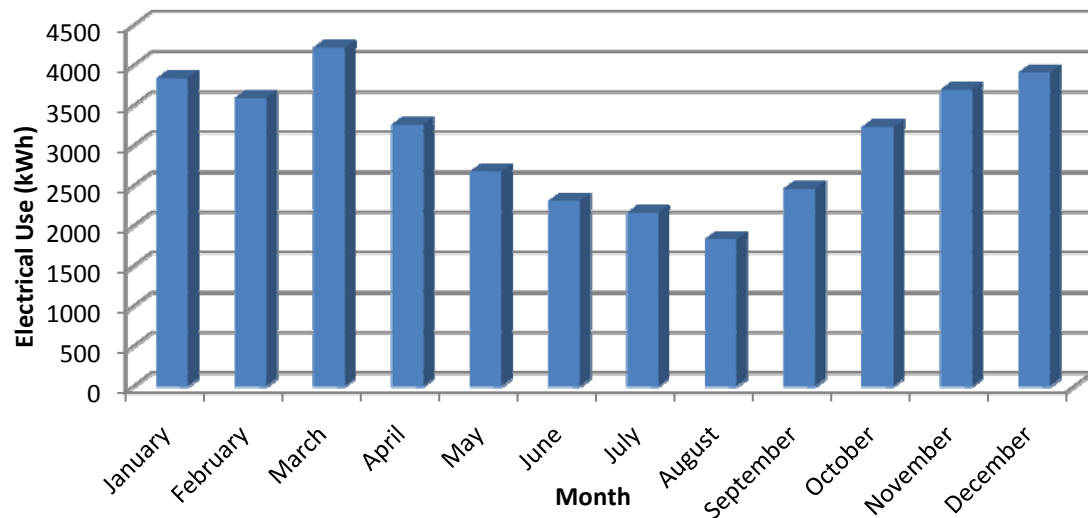


Table 3.11-14: Water Pollution Control - Minor Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	13.3
Winter	17.7

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.11.15 Water Pollution Control – Tyler Pump Station

Figure 3.11-16 illustrates the monthly total energy consumption from April 2009 through August 2010. From this graph, it can be determined that the baseline electrical consumption for Water Pollution Control - Tyler is approximately, 1,400 kWh/month.

Table 3.11-15 illustrates the seasonal peak demand loads for the Water Pollution Control - Tyler from April 2009 through August 2010.

Figure 3.11-16: Water Pollution Control - Tyler Electricity Usage

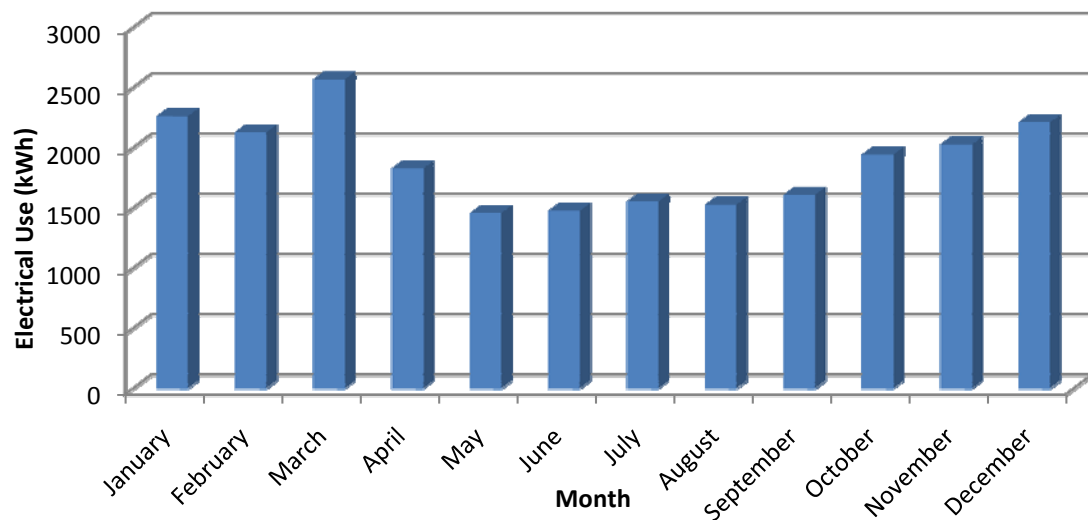


Table 3.11-15: Water Pollution Control - Tyler Seasonal Peak Demands

Season	Peak Demand (kW)
Summer	11.7
Winter	13.7

Refer to Table 3.12-1, in Section 3.12 for the average electrical aggregate cost. These tariffs are subject to change quite frequently. Refer to Appendix A for a complete Historical Data Analysis.

3.12 Aggregate Costs

For the purposes of computing energy savings for all identified energy conservation and retrofit measures, aggregate unit costs for electrical energy and fuel, in terms of cost/kWh, cost/therm or cost/gallon of oil, were determined for each service location and utilized in the simple payback analyses discussed in subsequent sections. The aggregate unit cost accounts for all distribution and supply charges for each location. Table 3.12-1 summarizes the aggregate costs for electrical energy consumption and fuel utilized.

Table 3.12-1: Aggregate Unit Costs			
Service Location	Aggregate \$/kWh	Aggregate \$/therm	Aggregate \$/gallon
City Hall	\$0.1761	\$2.18	\$1.7684
City Hall Annex	\$0.1894		
Main Office	\$0.1116		\$1.7684
Garage	"		
Water Filtration Plant	\$0.1565		\$1.7684
Well House 1	\$0.2400		
Well House 2	\$0.1857		
Well House 3,4 5	\$0.1585		
Chemical and Control Bldg	\$0.2971		
Pump and Control & Generator Bldg (Hill St)	\$0.2549		\$1.7684
Pump & Control Bldg (Peck Lane)	\$0.2234		
Pump & Control Bldg (Wolcott St)	\$0.3943		
Police/Court Complex & Parking Garage	\$0.1560		\$1.7684
Rockwell Park	\$0.3108		\$1.7684
Rockwell Pavilion	\$0.6409		\$1.7684
Bathhouse	\$0.3046		
Muzzy Field	\$0.5676	\$5.90	
Ski Lodge	\$0.3207		
Page Park Pavilion	\$0.4453		\$1.7684
Recreation Building	\$0.8733	\$2.40	
Fire Dept. Headquarters	\$0.1751		\$1.7684
Engine Co. 2	\$0.1905		\$1.7684
Engine Co. 3	\$0.2021	\$1.83	
Engine Co. 4	\$0.1895		\$1.7684

Table 3.12-1: Aggregate Unit Costs			
Service Location	Aggregate \$/kWh	Aggregate \$/therm	Aggregate \$/gallon
Engine Co. 5	\$0.1983		\$1.7684
Senior Center	\$0.1939	\$1.74	
Main Library	\$0.1743	\$2.02	
Public Library	\$0.0784	\$1.87	
Youth Services	\$0.3061		\$1.7684
Animal Control	TBD		
Community Services	\$0.1910		
Hill Street	\$1.1388		
City Yard	\$0.0882	\$1.50	
Transfer Station	\$0.1966		
Transfer Station Hut	\$0.4373		
WPCP	\$0.1540	\$1.64	
Boivin PS	\$0.1811		
Broad St PS	\$0.1738		
Cherry Hill PS	\$0.2142		
Cross PS	\$0.1849		
Drayla PS	\$1.2696		
East Main PS	\$0.1861		
Ivy PS	\$0.1784		
Julia PS	\$0.1742		
Lake PS	\$0.2536		
Lufkin PS	\$0.3833		
Matthews PS	\$0.1866		
Middle PS	\$0.1952		
Minor PS	\$0.1794		
Tyler PS	\$0.1954		

3.13 Portfolio Manager

3.13.1 Portfolio Manager Overview

Portfolio Manager is an interactive energy management tool that allows the City to track and assess energy consumption at the facilities in a secure online environment. Portfolio Manager can help the City set investment priorities, verify efficiency improvements, and receive EPA recognition for superior energy performance.

3.13.2 Energy Performance Rating

For many facilities, you can rate their energy performance on a scale of 1–100 relative to similar facilities nationwide. Your facility is *not* compared to the other facilities entered into Portfolio Manager to determine your ENERGY STAR rating. Instead, statistically representative models are used to compare your facility against similar facilities from a national survey conducted by the Department of Energy’s Energy Information Administration. This national survey, known as the Commercial Building Energy Consumption Survey (CBECS), is conducted every four years, and gathers data on building characteristics and energy use from thousands of facilities across the United States. Your facility’s peer group of comparison is those facilities in the CBECS survey that have similar facility and operating characteristics. A rating of 50 indicates that the facility, from an energy consumption standpoint, performs better than 50% of all similar facilities nationwide, while a rating of 75 indicates that the facility performs better than 75% of all similar facilities nationwide.

3.13.3 Portfolio Manager Account Information

A Portfolio Manager account has been established for the City, which includes a profile for the facilities covered under this energy audit. Information entered into the Portfolio Manager Facility profiles, including electrical energy consumption and fuel consumption has been used to establish a performance baseline. Statements of energy performance for each facility have been included in Appendix B.

It is recommended that the energy usage information be kept up to date within Portfolio Manager, to track the buildings’ energy usage. In order to receive a rating within Portfolio Manager, more than 50% of the building must be defined as a bank, courthouse, hospital, hotel, K-12 school, medical office, office, supermarket, wastewater treatment plant or data center. Therefore, the majority of the City’s buildings were not eligible for ratings.

Baseline ratings were established for City Hall, the WPCF and the Water Department Main Office. Results are a reflection of the information supplied, if more recent information is entered into the Portfolio Manager account, there is a possibility for better results. It should be noted that the gas use associate with the Water Department garage was not known at the time of the report. The buildings received the following ratings:

City Hall – 71
WPCF – 91
Water Department Office – 70

The following website link, username and password shall be used to access the Portfolio Manager account and building profiles that have been established for the City:

<https://www.energystar.gov/istar/pmpam/>

USERNAME: citybristolct

PASSWORD: energy2010

Section 4

Energy Conservation and Retrofit Measures (ECRM)

The following is a summary of how Annual Return on Investment (AROI), Internal Rate of Return (IRR), and Net Present Value (NPV) will be broken down in the cost analysis for all ECRMs recommended in this report.

Included in the simplified payback analysis summary table is the 'Annual Return on Investment' (AROI) values. This value is a performance measure used to evaluate the efficiency of an investment and is calculated using the following equation:

$$AROI = \frac{AECS + OCS}{NET\ ECM\ Cost} - \frac{1}{Lifetime}$$

Where OCS = Operating Cost Savings, and AECS = Annual Energy Cost Savings.

Also included in the table are net present values for each option. The NPV calculates the present value of an investment's future cash flows based on the time value of money, which is accounted for by a discount rate (DR) (assume bond rate of 3%). NPV is calculated using the following equation:

$$NPV = \sum_{n=0}^N \frac{C_n}{(1 + DR)^n}$$

Where C_n =Annual cash flow, and N = number of years.

The Internal Rate of Return (IRR) expresses an annual rate that results in a break-even point for the investment. If the City is currently experiencing a lower return on their capital than the IRR, the project is financially advantageous. This measure also allows the City to compare ECRM's against each other to determine the most appealing choices.

$$IRR \rightarrow 0 = \sum_{n=0}^N \frac{C_n}{(1 + IRR)^n}$$

Where C_n =Annual cash flow, and N = number of years.

The lifetime energy savings represents the cumulative energy savings over the assumed life of the ECRM.

4.1 Process Systems

4.1.1 Water Department

The goal of this section is to present energy reduction and cost saving measures related to the water treatment process and distribution system. The recommended measures may or may not have a capital cost or payback period associated with them, since some of the process optimizations are operational in nature and have very little or no capital cost but result in energy cost savings.

As discussed in Section 2.2.3, the main energy consuming components of the water treatment and distribution system are the conventional water filtration plant, five (5) wells and four (4) pumping stations that fill water storage reservoirs for distribution throughout the City. Conventional water filtration is generally a low energy process, where the bulk of the energy savings potential lies in the operation and efficiency of the larger motors and the management of peak demand (shifting to off-peak or shaving peak power usage).

4.1.1.1 Off-Peak Backwash Operation

The Water Filtration Plant is billed on a time of day schedule, therefore higher electricity rates are incurred during the peak electricity charge period of noon to 8 pm every day. Currently the backwash process is operated on a schedule of 7:15-7:30 am, 3:30-4:30 pm, and at 1 am, with one backwash period occurring during peak electric rates. To reduce peak demand charges, the backwash schedule may be modified to occur at 11 am, 9 pm and 6 am. This modification would still provide one backwash cycle per shift.

There are two (2) 15 hp wash water supply pumps and three (3) 3 hp wash water return pumps. Discussions with plant staff indicated that wash water can be supplied by gravity and that five hours are required to drain the wash water tank via gravity. Although drained by gravity, the return pumps are required to convey the backwash flow to the wash water treatment unit. Therefore, the assumption has been made that the wash water supply pumps are not utilized during the backwash cycle and that two wash water return pumps run continuously for five hours. By modifying the backwash schedule and making no additional capital investment, the City could save approximately \$1,070 per year in electricity costs through off peak operation.

4.1.1.2 Pumping Station Drives and Controls

The Water Department utilizes constant speed pumps and wells at the treatment plant and throughout the distribution system, operating on average 10 to 12 hours daily, year round. The water pumps and wells throughout the City are high head pumps, as a result of filling high elevation water tanks.

Based on the City's current water demand and discussions with the Water Department, the available water storage capacities and resulting hydraulic grade lines of the existing water reservoirs will not allow for a peak/off-peak pumping schedule, as a significant drop in the hydraulic grade of the storage tanks would result in

inadequate pressure throughout the distribution system. The required 'target level set points' in the water reservoirs is summarized in Table 2.2-1.

As such, pump speed adjustment capabilities through the installation of variable frequency drives (VFDs) would be recommended. However, the installation of VFDs is not appropriate for all pump applications, specifically those with high static head. Pumps with high static head requirements typically have limited turndown capacity since the pump curves are very steep and even a minor reduction in output head drastically reduces the output flow.

The VFDs would provide the ability to run the pump stations at lower speed for longer durations based on level feedback from the tanks. VFDs control the speed of the pump motors by varying the frequency of the power delivered to the motor. The result of which is to match the electrical power input to the hydraulic power needed. Currently the pumps are on a start/stop control to 'match' the flow required, including the four (4) raw water pumps at the filtration plant. While this achieves the same amount of work as a pump running turned down for longer durations, it does so at a higher power (kW) demand.

VFDs have not been recommended at the pump stations or well houses, due to the high static head that the pumps operate against. The details of the motor upgrades and VFD recommendations are summarized in Section 4-5.

4.1.2 Water Pollution Control

The goal of this section is to present energy reduction and cost saving measures related to the wastewater treatment process and collection system. The recommended measures may or may not have a capital cost or payback period associated with them, since some of the process optimizations are more operational in nature and have very little or no capital cost but result in energy cost savings.

4.1.2.1 Anoxic Zone Mixing

The aeration tanks are operated as two parallel trains. The first zone of each train is maintained at an oxygen deficit condition (anoxic zones) accepting the internal 30-40% sludge recycle flow. The anoxic zones are currently mixed with four (4) 10 hp submersible mixers. The mixers consume approximately 24,000 kWh of electricity per year at a cost of \$36,000 assuming constant operation. CDM evaluated replacing the existing submersible mixers with hyperbolic mixers or a pulsed large bubble mixing system in order to save energy.

Hyperbolic mixers, such as Invent mixers, are vertical shaft-type mixers with a hyperboloid shaped stirrer near the bottom of the tank. In addition to lower energy requirements, hyperbolic mixers have been found to have a superior hydraulic profile for denitrification as compared to submersible mixers. Four (4) 5 HP hyperbolic mixers would be required to replace the existing submersible mixers based on the tank dimensions and process operations in the anoxic zones. The hyperbolic mixer would be mounted on bridges with supports connected to the side of the tank. The new hyperbolic mixers would cost approximately \$261,000 including demolition, new

equipment and installation. Annually, hyperbolic mixers would save about \$20,000 in electricity costs and \$4,000 in maintenance costs. The City may be eligible for up to \$74,000 in incentives from CL&P for installing hyperbolic mixers, through CL&P's Comprehensive Initiative as discussed in Section 7.1-3. Additional information on this program is included in Appendix K.

Table 4.1-1 summarizes the simple payback period, annual return on investment, lifetime energy savings, internal rate of return and the net present value of installing hyperbolic mixers assuming a 15 year lifetime and 3 percent inflation.

Table 4.1-1 Anoxic Zone Mixing - Hyperbolic Mixers	
	New Hyperbolic Mixers
Engineer's Opinion of Probable Cost	\$282,828
Incentives	(\$74,000)
Total Probable Cost Estimate	\$208,828
Annual Energy Savings	\$19,726
Annual Maintenance Cost Savings (AMCS)	\$4,000
Simple Payback (years)	8.8
Annual Return on Investment (AROI)	6.4%
Lifetime Energy Savings (15 years)	\$367,254
Internal Rate of Return (IRR)	9.9%
Net Present Value (NPV)	\$153,752

Pulsed large bubble mixing, such as Bio^Mx by Enviromix, reduces energy requirements by using short bursts of compressed air to mix instead of mechanical mixing. Oxygen transfer is minimized because the bubbles are much larger than those produced by coarse bubble diffusers. Tests have shown mixing to be similar to submersible mixers; however pulsed large bubble mixing is more variable. The pulsed large bubble mixing system required to replace the existing submersible mixer would include the following equipment:

- One (1) 20 HP air compressor with a 120 gallon receiver
- Four (4) valve control panels
- 104 stainless steel nozzles
- Stainless steel piping and fittings

The valve control panels would be placed on the side of the tanks, and the compressor would need to be located near the tanks most likely in the aeration blower building. The new pulsed large bubble mixing system would cost approximately \$411,000 including demolition, new equipment and installation. Annually, hyperbolic mixers would save approximately \$19,000 in electricity costs and \$4,000 in maintenance costs. The City may be eligible for up to \$70,000 in incentives from CL&P for installing a pulsed large bubble mixing system through CL&P's Comprehensive Initiative as discussed in Section 7.1-3. Additional information on this program is included in Appendix K.

Table 4.1-2 summarizes the simple payback period, annual return on investment, lifetime energy savings, internal rate of return and the net present value of installing a pulsed large bubble mixing system assuming a 15 year lifetime and 3 percent inflation.

Table 4.1-2 Anoxic Zone Mixing - Pulsed Large Bubble Mixing System	
	New Pulsed Large Bubble Mixing System
Engineer's Opinion of Probable Cost	\$436,800
Incentives	(\$70,000)
Total Probable Cost Estimate	\$366,800
Annual Energy Savings	\$19,000
Annual Maintenance Cost Savings (AMCS)	\$4,000
Simple Payback (years)	15.9
Annual Return on Investment (AROI)	1.1%
Lifetime Energy Savings (15 years)	\$344,768
Internal Rate of Return (IRR)	0.5%
Net Present Value (NPV)	(\$40,501)

Based upon the simple payback periods, internal rates of return and net present values of the energy savings alternatives evaluated, it is recommended that the hyperbolic mixers be installed in the anoxic zones to replace the existing submersible mixers.

4.1.2.2 Turbo Blowers

The aeration air is currently supplied by two (2) 250 hp multistage centrifugal blowers, equipped with VFDs and two (2) 350 hp constant speed multistage centrifugal blowers. Under normal operating conditions one 250 or one 350 hp blower is required. Additionally, the City is in the midst of completing the installation of a DO control loop to optimize the operation of the existing aeration blowers, which is

one of the more critical elements to an energy conservation project for an aeration system.

CDM analyzed the existing conditions to determine if energy savings can be realized with blower modifications or replacements. Table 4.1-3 summarizes the operating conditions utilized to estimate the current annual cost of operation.

Table 4.1-3: Existing Annual Energy Consumption and Cost	
Operation:	24 hour, 7 day operation
Summer Operation:	721,475
Winter Operation:	816,497
Annual kWh:	1,537,972
Annual Energy Cost:	\$236,848

1. During July, August and half of September, one 350 hp blower operates 12 hours per day. For the remainder of the summer hours one 250 hp blower operates on VFD. One 250 hp blower operates throughout the winter.

The facility influent data was analyzed to determine the actual and design blower demands for the Aeration System. The aeration analysis determines the oxygen demand in lbs/day based on the tank volume and is then converted to air flow (scfm) was based on the oxygen transfer efficiency (OTE) of fine bubble diffusers in the aerated zones.

Table 4.1-4: Annual Average Aeration System Analysis Summary

		Average	Max Month	Max Day
Aeration Tank Influent Flow	mgd	9.2	13.1	19.1
Wastewater Temperature	deg C	17.4	17.4	17.4
Beta		0.95	0.95	0.95
Alpha		0.65	0.65	0.65
Oxygen Saturation (Cd, based on WW temp)	mg/L	9.58	9.58	9.58
Dissolved Oxygen Concentration	mg/L	2	2	2
Oxygen Saturation (Cs, based on Standard Conditions)	mg/L	9.09	9.09	9.09
Oxygen Demand/BOD removed	lb/lb	1.19	1.19	1.19
Oxygen Demand/TKN removed	lb/lb	4.25	4.25	4.25
Influent BOD Concentration	mg/L	115	81	90
Influent BOD Load	lb/day	8,785	12,978	10,205
Influent Nitrogen Concentration	mg/L	13.1	7.9	10.1
Influent Nitrogen Load	lb/day	1,001	1,265	1,151
Oxygen Demand	lb/day	8,697	12,887	15,283
Density of Air		0.075	0.075	0.075
Diffuser Efficiency	%	12	12	12
Oxygen in Air	%	23.20%	23.20%	23.20%

		Average	Max Month	Max Day
Oxygen Transfer Efficiency (OTE), field	%	13%	13%	13%
Air Flow	scfm	2,682	3,975	4,714
Air Flow (summer)	Acfm	3,080	4,564	5,412

To achieve energy savings for the aeration system, installing new turbo high-efficiency blowers with VFDs have been evaluated. A turbo blower to meet the calculated max day condition of 5,400 scfm was selected. The turbo blower would have a shaft power of 246 bhp at the design condition and require a 300 hp motor. Two of these blowers would be used to replace the existing 350 hp compressors. These proposed blowers would be able to turn down to approximately 3,200 SCFM. Therefore under average summer conditions, the proposed blowers would operate at a lower power requirement compared to the existing blowers.

Table 4.1-5 summarizes the savings potential associated with operating these turbo blowers during the summer months.

Table 4.1-5: Potential Energy Consumption and Cost Savings with Turbo Blowers		
	Existing	With 300 hp Turbo Blowers ¹
Operation:	24 hour, 7 day operation (constant speed)	24 hour, 7 day operation
Summer Operation (kWh):	721,475	592,920
Winter Operation (kWh):	816,497	816,497
Annual kWh:	1,537,972	1,409,417
Annual Energy Cost:	\$236,848	\$217,050
Annual Energy Cost Savings:	\$19,798 (128,555 kWh)	

1. The analysis has been completed to meet the average summer condition of 3,200 scfm. At this flow rate the turbo blower would operate at 150 bhp and be 90% efficient at this operating point.

The engineers probable cost of construction is \$865,145, which leads to a payback in excess of 40 years. As such, it is not recommended that the City pursue the installation of new turbo blowers.

4.1.2.3 UV System

The UV system consists of four (4) inline UV disinfection vessels. There are four lamp modules per UV vessel. The UV system is operated seasonally. The system is currently not operating in automatic and consequently one or two vessels are operated (depending on flow) continuously to ensure compliance with the plant's discharge permit.

One UV vessel is designed to treat up to 8.33 MGD of flow, with the four modules energized. The electrical energy demand for each UV lamp module is 7.8 kW or 31 kW for one UV vessel (4 modules per UV vessel).

Analysis of the plant's current operating procedure without flow pacing of the lamp modules equates to an annual energy usage of 206,600 kWh/year and at \$0.154/kWh an annual operating cost of \$31,816. This does not account for maintenance time required for cleaning of the lamp modules and / or replacement of lamps or ballasts.

The upgrade of the UV system controls to allow for flow pacing of the banks as been evaluated as a potential energy savings measure.

Integration of Automatic Flow Pacing

As discussed previously, the UV Disinfection system no longer operates automatically based on flow conditions. Upgrading the system to incorporate automatic flow pacing and controlling the operation of the UV lamp modules, would at a minimum involve the installation of a new PLC based control panel with operator touch screen. This control panel would be interfaced with an influent flow meter and UV transmittance meter to calculate the required UV dose. In turn, the system would adjust the number of UV banks to provide this UV dose.

It is projected that with the ability to energize only the necessary banks an annual energy savings of 63,128 kWh and an annual energy cost savings of \$9,722 may be possible.

The following table, Table 4.1-7, summarizes the simple payback and financial analysis of this alternative.

Table 4.1-7: UV Disinfection System ECRMs	
	Flow Pacing Integration
Engineer's Opinion of Probable Cost	\$179,400
Incentive	\$31,561
Total Cost	\$147,839
Annual Energy Savings	\$9,722
Annual Maintenance Cost Savings (AMCS)	NA
Simple Payback	15.2
Annual Return on Investment (AROI)	1.6%
Lifetime Energy Savings (15 years)	\$180,819
Internal Rate of Return (IRR)	2.5%
Net Present Value (NPV)	\$5,373

Based upon the simple payback periods, internal rates of return and net present values of the two energy savings alternatives evaluated, it is recommended that the City implement Flow Pacing Integration of the existing UV System.

4.1.2.4 Plant Water System

The existing plant water system at the Bristol WPCF consists of three 15 HP, 255 gpm at 140 TDH centrifugal pumps and a hydropneumatic tank. The primary uses of plant water are the two belt filter press booster pumps and the screening and grit equipment in the Headworks Building. There are also three spray water pumps serving the foam control nozzles on the aeration basins, which are independent of the three plant water pumps. The spray water pumps are each 15 HP, 275 gpm at 92 TDH centrifugal pumps.

CDM evaluated replacing the existing plant water and spray water pumps and hydropneumatic tank with a packaged plant water system, such as SyncroFlo, in order to save energy. The packaged plant water system would consist of four (4) 15 HP premium efficient pumps with variable frequency drives and a programmable logic controller (PLC) connected to SCADA. The system would improve energy efficiency by eliminating a 15 HP pump during normal operations and allow the pumps to vary flow while maintaining system pressure.

The new packaged plant water system would cost approximately \$249,000 including demolition of existing equipment, new equipment and installation. Annually, the new system would save approximately \$14,000 in electricity costs and \$1,000 in maintenance costs. The City may be eligible for up to \$48,000 in incentives from CL&P for installing a packaged plant water system.

Table 4.1-8 summarizes the simple payback period, annual return on investment, lifetime energy savings, internal rate of return and the net present value of installing a packaged plant water system assuming a 15 year lifetime and 3 percent inflation.

Table 4.1-8 Plant Water System	
	New Packaged Plant Water System
Engineer's Opinion of Probable Cost	\$249,000
Incentives	\$48,000
Total Probable Cost	\$201,000
Annual Energy Savings	\$14,000
Annual Maintenance Cost Savings (AMCS)	\$1,000
Simple Payback (years)	13.7
Annual Return on Investment (AROI)	3.5%
Lifetime Energy Savings (15 years)	\$274,000
Internal Rate of Return (IRR)	3.8%
Net Present Value (NPV)	\$13,000

CDM does not recommended installing a new packaged plant water system at this time based upon the long simple payback period and low net present value of installing the new system. Given the age of the existing three plant water pumps, the City may need to replace these pumps in the near future. The City should consider installing a packaged plant water system at that time.

Foam Control

Currently, one 15 HP spray water pump is operated continuously to provide plant water for foam control nozzles at the aeration basins. The pump uses approximately 88,000 kWh of electricity per year at a cost of \$13,600. Foam formation can be caused by a variety of process or influent issues, including industrial discharges, low food to microorganism (F/M) ratios, nutrient deficiencies in the activated sludge system, or recirculation of foam causing bacteria through the plant via the scum collection system. The City should consider investigating potentially disruptive industrial discharges, monitoring patterns of foam, F/M and nutrients in the aeration basins, or re-route the scum collection system. If the origin of the foam formation cannot be mitigated, the City should consider installing a programmable timer to control the spray water pumps. Typically foaming follows a diurnal or seasonal pattern, and the timer could be set to operate the spray water pumps for short intervals during the time of day or year when foaming increases. For example, the city could run the pumps once an hour for 30 minutes at night (8 hours) and 15 minutes every two hours during the day (16 hours) if foaming typically occurs at night. This would result in the pumps operating 6 hours per day instead of 24 hours, and electricity cost savings of \$10,200 per year. The City could install such a timer for less than \$10,000, with a resulting payback period of less than year.

Table 4.1-9 summarizes the simple payback period, annual return on investment, lifetime energy savings, internal rate of return and the net present value of installing a programmable timer on the spray control pumps assuming a 15 year lifetime and 3 percent inflation.

Table 4.1-9 Spray Water System	
	New Programmable Timer
Engineer's Opinion of Probable Cost	\$9,048
Annual Energy Savings	\$10,200
Annual Maintenance Cost Savings (AMCS)	\$0
Simple Payback (years)	0.9
Annual Return on Investment (AROI)	108%
Lifetime Energy Savings (15 years)	\$189,709
Internal Rate of Return (IRR)	108%

Table 4.1-9 Spray Water System	
	New Programmable Timer
Net Present Value (NPV)	\$151,697

The City could also reduce the flow rate of the foam control nozzles by installing new nozzles that produce a wide mist. Foam is typically controlled better by a mist than a high pressure, high volume spray. VFDs would need to be installed on the spray water pumps to take advantage of the energy savings associated with installing new foam control nozzles.

4.1.2.5 Sludge Storage Tanks

Co-thickened primary and secondary sludge is conveyed to one of two sludge storage tanks. The co-thickened sludge is currently stored in the thickened sludge storage tank with an operating volume of 122,000 gallons. The second sludge storage tank at the Bristol WPCF was a waste activated sludge (WAS) storage tank with an operating volume of 346,000 gallons. The WAS storage tank is not currently used. The co-thickened sludge storage tank is mixed and aerating using course bubble diffusers. Air is supplied to the diffusers by a premium efficient 40 HP blower with a VFD. Both the blower motor and VFD were recently replaced in order to reduce energy consumption. The operators have indicated the current fine bubble diffusers and aeration rate barely keep the sludge aerobic at moderate tank elevations.

CDM evaluated opportunities to improve the energy and process efficiency of mixing and aerating the stored co-thickened sludge. Initially, hyperbolic mixers and pulsed large bubble mixing systems, including Invent mixers and Bio^{Mx}, were considered but were found to be inadequate for the aerating requirements of the sludge storage tank. In order to provide the required aeration, CDM evaluated jet mixing and aeration systems including eddy mix jet aerators from Mixing Systems, Inc. and radial jet pod aerators from Mass Transfer System, Inc. While these systems would improve the aeration, they would not reduce energy use. CDM does not recommend installing a jet mixing and aeration system for the current sludge operating conditions. The existing course bubble diffusers, premium efficient blower and VFD provide the most efficient mixing and aerating for the current sludge storage operations. A jet mixing and aeration system would be more appropriate for a completely filled sludge storage tank. The City should consider installing a jet mixing and aeration system in the WAS storage tank if this tank is recommissioned.

4.1.2.6 Anaerobic Digestion

As indicated above, co-thickened primary and secondary sludge is currently conveyed to one of the two sludge storage tanks. The sludge storage tanks were previously utilized as digesters and were built around 1950. In the mid 1980s, the bottoms of the tanks were re-tapered with concrete and retrofitted with course bubble diffusers to facilitate the mixing and aerating of the sludge. The two sludge storage

tanks are 50 foot in diameter with a side water depth of 25 feet, relating to a useable volume of 367,000 gallons each.

CDM has evaluated the current sludge production and sludge storage volume, as on-site digestion of the sludge creates methane gas, which when used as a fuel has the potential to off-set the plant's electrical and purchased fuel consumption. The current WAS and primary sludge (calculated) flow averages around 37,537 gpd. The resulting detention time in both of the 'digesters' is on average 20 days. Assuming 5% total solids and 65% volatile solids content, this results in an average volatile solids loading of 0.11 lbs VS/ft³-day.

Typical design peak sustained volatile solids loading ranges from 0.1 to 0.2 lbs VS/ft³-day and detention times between 10 and 20 days for high-rate anaerobic digesters. Additionally, digestion efficiency drops off when processing co-thickened sludge.

At a 35% destruction of volatile solids rate and a digester gas production rate of 15 ft³/lb VS destroyed, it is computed that 56,816 ft³/day of digester gas could be collected and utilized on-site in a cogeneration facility. For the purposes of this analysis, 2 – 160 kW internal combustion engines were assumed, as the turn-down capability of the engines accommodates diurnal dips in digester gas production.

Recommissioning the digesters and installing a cogeneration facility is a large capital investment, involving the installation of new digester mixing systems, new digester heating loop, boilers and the cogeneration facility. This investment roughly on the order of \$4 million dollars would result in an annual energy cost saving of \$165,057.

It should be noted that re-implementing digestion would impact the operation of the current dewatering system and would lower the heating value of the sludge which may impact the final disposal method of incineration. The economic analysis would have to account for the decrease in % cake of the plant's final product and the resulting increase in hauling costs. Additionally, the plant currently doesn't have additional storage volume for concentration of the solids and for contingency should equipment failures lend to the need to lengthy on-site storage. As such, moving forward with digestion with the intent of implementing on-site cogeneration would require changes to the overall sludge processing and disposal operation and is not recommended at this time.

4.1.2.7 Hydro-Electric Energy

The goal of this section is to evaluate the hydraulic characteristics of the plant and available energy associated with the existing plant outfall and to investigate if the installation of a hydro-electric system is cost effective. The plant effluent consists of Cascade Aeration with an elevation change of 8 feet, prior to being conveyed through the outfall pipe.

Water power is the combination of head and flow. In a typical hydro system, water is diverted from a stream or reservoir into a pipeline called a penstock, where it is conveyed downhill and through a turbine. The vertical drop or static elevation (head) creates pressure at the bottom end of the penstock. The pressurized water emerging

from the end of the penstock creates the force that drives the turbine. More flow or more head, increases the potential power that can be generated.

Therefore, before planning a hydro-electric system or estimating how much power can be produced, the amount of static head available, the net head available, the design flow and the length of the penstock or pipeline must be determined. The net head is defined as the pressure available at the turbine when water is flowing, which will always be less than the pressure when the water is not flowing.

The most appropriate location to install a hydro-electric system would be at the outfall location as a result of the static head available. However, the use of the Cascade Aeration steps would have to be eliminated and consequently adequate dissolved oxygen may not be provided to meet the plant's effluent permit, within the plant.

Once the net head and design flow are known, the theoretical power to be generated by a hydro-electric plant in Hp or Kilowatts can be computed as follows:

$$\text{Theoretical Horsepower (Hp)} = \frac{\text{Net Head (feet)} \times \text{Flow (cubic feet per second)}}{8.8} \quad (1)$$

$$\text{Theoretical Kilowatts (Kw)} = \frac{\text{Net Head (feet)} \times \text{Flow (cubic feet per second)}}{11.81} \quad (2)$$

Static Head = 8 feet.

Average plant flow = 9 MGD (14 ft³/s).

The effluent flows through 8,100 linear feet of 48-inch diameter outfall pipe. To determine the net available head to drive the turbine, the pipe frictional losses within the 48-inch diameter outfall pipe must be calculated. Calculation of pipeline frictional losses is accomplished through the use of the Hazen-Williams equation which is as follows:

$$H_f = \frac{(10.44)(L)(\text{Flow})^{1.85}}{(C)^{1.85} (d)^{4.8655}}$$

Where: L = length of pipeline in feet
 Flow = design flow in gallons per minute
 C = Hazen-Williams coefficient selected as 100
 d = diameter of pipeline in inches
 H_f = frictional losses in feet

The pipeline frictional losses can be computed as follows:

$$H_f = \frac{(10.44)(8,100)(6250)^{1.85}}{(100)^{1.85} (48)^{4.8655}} = 1.2 \text{ feet}$$

Therefore, the net available head to drive a turbine = 8 feet – 1.2 feet = 6.8 feet.

From equation number 2, the theoretical power in kilowatts is computed as follows:

$$\text{Theoretical Power (kW)} = \frac{(6.8 \text{ feet}) \times (14 \text{ ft}^3/\text{s})}{11.81} = 8.1 \text{ kW}$$

Assuming an efficiency of 70 percent for the turbine and generator combination, the calculated power that can be generated from this application can be calculated as follows:

$$\text{Actual Power (kW)} = 8.1 \times 0.7 = 5.7 \text{ kW} \rightarrow 6 \text{ kW}$$

Assuming 24 hour operation of the hydro-electric power plant, the annual energy production is calculated to be 52,560 kW-hrs and at energy cost of \$0.1540/kW-hr, the annual electric energy savings is computed to be as follows:

$$\text{Annual Electric Energy Savings} = 6\text{kW} \times 24 \text{ hr/day} \times 365 \text{ days/year} \times \$0.154/\text{Kw-hr} = \$8,094/\text{year}$$

Rentricity, a typical engineering firm and supplier of hydro-electric equipment, estimates that the capital equipment cost for a standard 10 kW hydro-electric power plant, engineering and permitting fees will be approximately \$60,000. The following table summarizes the simple payback associated with this system.

Table 4.1-10: 10 kW Hydroelectric Turbine System	
	Hydroelectric System
Engineer's Opinion of Probable Cost	\$323,856
Incentive	\$35,040
Total Cost	\$288,816
Annual Energy Savings	\$8,092
Annual Maintenance Cost Savings (AMCS)	(\$700)
Simple Payback	39
Annual Return on Investment (AROI)	-2.4%
Lifetime Energy Savings (15 years)	\$150,502
Internal Rate of Return (IRR)	-7.5%
Net Present Value (NPV)	(\$170,286)

Based on the simple payback analysis, which is not accounting for an increase in blower speed to ensure the effluent dissolved oxygen permit limit is maintained, the

implementation of a hydroelectric system at the plant's outfall is not currently recommended from an energy standpoint alone.

4.2 Building Lighting Systems

The goal of this section is to present any lighting energy conservation measures that may also be cost beneficial. It should be noted that replacing current bulbs with more energy-efficient equivalents will have a small effect on the building heating and cooling loads. The building cooling load will see a small decrease from an upgrade to more efficient bulbs and the heating load will see a small increase, as the more energy efficient bulbs give off less heat.

Two options are offered for most buildings, where both interior and exterior lighting upgrades are being proposed. The first option will be for upgrading existing interior lighting, if applicable. The second option will be for upgrading existing exterior lighting, if applicable. A total cost for upgrading both options at the same time will be presented. Retrofitting of existing fluorescent fixtures includes upgrading both ballasts and lamps for the fixture. For buildings only requiring interior or exterior upgrades, only the applicable upgrade option is listed. Refer to Appendix G for more information.

Please note that the Engineer's Estimate of Probable Construction Costs presented herein are estimates based on historic data compiled from similar installations and engineering opinions. Additional engineering will be required for each measure identified in this report and final scope of work and budget cost estimates will need to be confirmed prior to the coordination of project financing or the issuance of a Request for Proposal.

4.2.1 City Hall Lighting System Improvements

It is recommended that the existing lighting systems at the following facilities be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade, as presented in Appendix G, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems.

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix G for a line-by-line proposed detailed lighting upgrades list.

The following table, Table 4.2-1, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the City Hall Building.

Table 4.2-1 City Hall Lighting System Improvements***												
	Engineer's Opinion of Probable Cost	CL&P Rebate	Total Cost	Annual kW Savings	Annual kWh Savings	Annual Energy Savings	Annual Maintenance Cost Savings (AMCS)	Simple Payback	Annual Return on Investment (AROI)	Lifetime Energy Savings (15 years)**	Internal Rate of Return (IRR)	Net Present Value (NPV)
City Hall - Interior Lighting	\$8,243.3	(\$330.0)	\$7,913.3	3.5	4,216.9	\$742.6	\$731.2	5.4 Years	11.96%	\$147,179.60	19.66%	13,549.58
City Hall - Exterior Lighting	\$2,682.4	\$0.0	\$2,682.4	0.7	3,193.0	\$562.3	\$3.8	4.7 Years	14.44%	\$10,458.00	22.55%	5,561.18
City Hall - Total	\$10,925.7	(\$330.0)	\$10,595.7	4.2	7,409.9	\$1,304.9	\$735.0	5.2 Years	12.58%	\$24,269.41	20.40%	19,110.76
City Hall Annex - Interior Lighting	\$915.0	(\$50.0)	\$865.0	0.2	268.7	\$50.9	\$22.5	11.8 Years	1.82%	\$946.57	5.85%	203.45
City Hall Annex - Exterior Lighting	\$293.3	\$0.0	\$293.3	0.5	2,330.2	\$441.3	\$36.8	0.6 Years	156.38%	\$8,208.30	166.04%	6,669.73
City Hall Annex - Total	\$1,208.2	(\$50.0)	\$1,158.2	0.7	2,598.9	\$492.2	\$59.3	2.1 Years	40.95%	\$9,154.87	50.45%	6,873.17

* Additional incentives, based on eligibility, are available through CL&P, see Appendix K.

**3% yearly inflation on electricity costs

***See Appendix L & M for ECRM Financial Analyses

4.2.2 Water Department Lighting System Improvements

It is recommended that the existing lighting systems at the following facilities be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade, as presented in Appendix G, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems.

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix G for a line-by-line proposed detailed lighting upgrades list.

The following table, Table 4.2-2, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Water Department Buildings.

Table 4.2-2 Water Department Lighting System Improvements***												
	Engineer's Opinion of Probable Cost	CL&P Rebate	Total Cost	Annual kW Savings	Annual kWh Savings	Annual Energy Savings	Annual Maintenance Cost Savings (AMCS)	Simple Payback	Annual Return on Investment (AROI)	Lifetime Energy Savings (15 years)**	Internal Rate of Return (IRR)	Net Present Value (NPV)
Water Department - Main Office - Interior	\$3,335.0	(\$110.0)	\$3,225.0	1.4	4,391.6	\$490.1	\$283.1	4.2 Years	17.31%	\$9,115.45	25.78%	8,034.56
Water Department - Main Office - Exterior	\$5,945.5	\$0.0	\$5,945.5	0.4	1,611.8	\$179.9	\$8.6	31.5 Years	(3.50%)	\$3,345.60	(5.65%)	(3,200.00)
Water Department - Main Office - Total	\$9,280.5	(\$110.0)	\$9,170.5	1.8	6,003.5	\$670.0	\$291.7	9.5 Years	3.82%	\$12,461.05	9.00%	4,834.57
Water Department - Garage - Interior	\$625.3	(\$30.0)	\$595.3	0.1	55.5	\$6.2	\$9.2	38.7 Years	(4.08%)	\$115.20	(7.61%)	(371.35)
Water Department - Garage - Exterior	\$5,945.5	\$0.0	\$5,945.5	0.4	1,611.8	\$179.9	\$0.0	33.1 Years	(3.64%)	\$3,345.60	(6.11%)	(3,325.87)
Water Department - Garage - Total	\$6,570.8	(\$30.0)	\$6,540.8	0.5	1,667.3	\$186.1	\$9.2	33.5 Years	(3.68%)	\$3,460.80	(6.24%)	(3,697.22)
Water Department - Water Filtration Plant - Interior	\$1,919.8	(\$140.0)	\$1,779.8	0.2	230.9	\$36.1	\$53.1	19.9 Years	(1.65%)	\$672.06	(0.80%)	(479.61)
Water Department - Water Filtration Plant - Exterior	\$0.0	\$0.0	\$0.0	3.6	0.0	\$2,498.5	\$0.0	5.3 Years	12.10%	\$46,470.10	19.83%	23,248.88
Water Department - Water Filtration Plant - Total	\$1,919.8	(\$140.0)	\$1,779.8	3.8	230.9	\$2,534.7	\$53.1	5.8 Years	10.49%	\$47,142.15	17.90%	22,769.27
Water Department - High Service Pump Station - Interior	\$143.8	\$0.0	\$143.8	0.2	586.6	\$91.8	\$53.1	1.0 Years	94.16%	\$1,707.32	103.82%	1,967.04
Water Department - High Service Pump Station - Exterior	\$1,486.4	\$0.0	\$1,486.4	0.1	403.0	\$63.1	\$1.5	23.0 Years	(2.33%)	\$1,172.91	(2.41%)	(546.72)
Water Department - High Service Pump Station - Total	\$1,630.1	\$0.0	\$1,630.1	0.3	989.5	\$154.9	\$54.6	7.8 Years	6.18%	\$2,880.23	12.37%	1,420.32
Water Department - #1 Well House - Interior	\$1,151.7	(\$20.0)	\$1,131.7	0.7	365.5	\$87.7	\$158.4	4.6 Years	15.08%	\$1,631.50	23.28%	2,452.44
Water Department - #1 Well House - Exterior	\$743.2	\$0.0	\$743.2	0.0	201.5	\$48.4	\$1.1	15.0 Years	(0.01%)	\$899.35	2.59%	(23.25)
Water Department - #1 Well House - Total	\$1,894.9	(\$20.0)	\$1,874.9	0.8	567.0	\$136.1	\$159.5	6.3 Years	9.10%	\$2,530.85	16.17%	2,429.19
Water Department - #2 Well House - Total	\$743.2	\$0.0	\$743.2	0.0	201.5	\$37.4	\$1.1	19.3 Years	(1.49%)	\$695.88	(0.43%)	(182.58)
Water Department - #3 Well House - Total	\$71.9	\$0.0	\$71.9	0.1	47.0	\$7.4	\$26.6	2.1 Years	40.67%	\$138.55	50.17%	423.58
Water Department - #4 Well House - Total	\$71.9	\$0.0	\$71.9	0.1	47.0	\$7.4	\$0.0	9.6 Years	46.89%	\$138.55	56.46%	488.74
Water Department - #5 Well House - Interior	\$71.9	\$0.0	\$71.9	0.1	47.0	\$7.4	\$26.6	2.1 Years	40.67%	\$138.55	50.17%	423.58
Water Department - #5 Well House - Total	\$815.1	\$0.0	\$815.1	0.1	248.5	\$39.4	\$26.9	12.3 Years	1.47%	\$732.50	5.27%	150.78
Water Department - Chemical and Control - Interior	\$208.4	(\$10.0)	\$198.4	0.0	18.5	\$5.5	\$3.1	23.2 Years	(2.35%)	\$102.23	(2.48%)	(73.81)
Water Department - Chemical and Control - Exterior	\$743.2	\$0.0	\$743.2	0.0	201.5	\$59.9	\$0.4	12.3 Years	1.44%	\$1,113.33	5.21%	133.87
Water Department - Chemical and Control - Total	\$951.6	(\$10.0)	\$941.6	0.1	220.0	\$65.4	\$3.4	13.7 Years	0.64%	\$1,215.55	3.81%	60.06
Water Department - Generator - Interior	\$756.4	(\$20.0)	\$736.4	0.2	107.0	\$27.3	\$12.2	18.6 Years	(1.30%)	\$507.27	(0.02%)	(160.87)
Water Department - Generator - Exterior	\$743.2	\$0.0	\$743.2	0.0	201.5	\$51.4	\$0.4	14.4 Years	0.29%	\$955.19	3.17%	10.05
Water Department - Generator - Total	\$1,499.6	(\$20.0)	\$1,479.6	0.3	308.5	\$78.6	\$12.6	16.2 Years	(0.50%)	\$1,462.46	1.65%	(150.82)
Water Department - Main Office - Interior	\$3,335.0	(\$110.0)	\$3,225.0	1.4	4,391.6	\$490.1	\$283.1	4.2 Years	17.31%	\$9,115.45	25.78%	8,034.56
Water Department - Main Office - Exterior	\$5,945.5	\$0.0	\$5,945.5	0.4	1,611.8	\$179.9	\$8.6	31.5 Years	(3.50%)	\$3,345.60	(5.65%)	(3,200.00)
Water Department - Main Office - Total	\$9,280.5	(\$110.0)	\$9,170.5	1.8	6,003.5	\$670.0	\$291.7	9.5 Years	3.82%	\$12,461.05	9.00%	4,834.57

* Additional incentives, based on eligibility, are available through CL&P, see Appendix K.

**3% yearly inflation on electricity costs

***See Appendix L & M for ECRM Financial Analyses

4.2.3 Police Department Lighting System Improvements

It is recommended that the existing lighting systems at the following facilities be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade, as presented in Appendix G, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems.

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix G for a line-by-line proposed detailed lighting upgrades list.

The following table, Table 4.2-3, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Police Department Buildings.

Table 4.2-3 Police Department Lighting System Improvements***												
	Engineer's Opinion of Probable Cost	CL&P Rebate	Total Cost	Annual kW Savings	Annual kWh Savings	Annual Energy Savings	Annual Maintenance Cost Savings (AMCS)	Simple Payback	Annual Return on Investment (AROΙ)	Lifetime Energy Savings (15 years)**	Internal Rate of Return (IRR)	Net Present Value (NPV)
Police Court - Interior Lighting	\$7,268.7	(\$400.0)	\$6,868.7	4.141	11,941.0	\$1,862.8	\$850.4	2.5 Years	32.83%	\$34,645.97	42.19%	32,644.14
Police Court - Exterior Lighting	\$16,094.3	\$0.0	\$16,094.3	4.374	19,158.1	\$2,988.7	\$827.8	4.2 Years	(6.67%)	\$28,517.35	NA	(16,094.25)
Police Court - Total	\$23,363.0	(\$400.0)	\$22,963.0	8.515	31,099.1	\$4,851.5	\$850.4	4.0 Years	18.16%	\$28,517.35	26.72%	60,074.16
Parking Garage - Exterior Lighting	\$11,830.6	\$0.0	\$11,830.6	2.244	9,828.7	\$1,533.3	\$80.0	7.3 Years	(6.67%)	\$28,517.35	NA	(11,830.63)
Parking Garage - Total	\$11,830.6	\$0.0	\$11,830.6	2.244	9,828.7	\$1,533.3	\$80.0	7.3 Years	(6.67%)	\$28,517.35	NA	(11,830.63)

* Additional incentives, based on eligibility, are available through CL&P, see Appendix K.
**3% yearly inflation on electricity costs
***See Appendix L & M for ECRM Financial Analyses

4.2.4 Parks and Recreation Lighting System Improvements

It is recommended that the existing lighting systems at the following facilities be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade, as presented in Appendix G, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems.

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix G for a line-by-line proposed detailed lighting upgrades list.

The following table, Table 4.2-4, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Parks and Recreation Department Buildings.

Table 4.2-4 Parks and Recreation Lighting System Improvements***												
	Engineer's Opinion of Probable Cost	CL&P Rebate	Total Cost	Annual kW Savings	Annual kWh Savings	Annual Energy Savings	Annual Maintenance Cost Savings (AMCS)	Simple Payback	Annual Return on Investment (AROΙ)	Lifetime Energy Savings (15 years)**	Internal Rate of Return (IRR)	Net Present Value (NPV)
Parks and Recreation - Rockwell Park - Interior	\$6,313.6	(\$210.0)	\$6,103.6	1.9	1,014.0	\$315.1	\$207.4	11.7 Years	1.89%	\$5,861.18	5.98%	1,505.78
Parks and Recreation - Rockwell Park - Exterior	\$1,486.4	\$0.0	\$1,486.4	0.1	46.0	\$14.3	\$0.7	98.9 Years	(5.66%)	\$265.90	(15.42%)	(1,267.54)
Parks and Recreation - Rockwell Park - Total	\$7,800.0	(\$210.0)	\$7,590.0	2.0	1,060.0	\$329.4	\$208.1	14.1 Years	0.42%	\$6,127.09	3.40%	238.25
Parks and Recreation - Rockwell Pavilion - Interior	\$325.6	(\$20.0)	\$305.6	0.1	50.9	\$32.6	\$26.6	5.2 Years	12.70%	\$606.73	20.54%	556.45
Parks and Recreation - Rockwell Pavilion - Exterior	\$743.2	\$0.0	\$743.2	0.0	200.6	\$128.5	\$0.4	5.8 Years	10.68%	\$2,390.68	18.12%	1,134.05
Parks and Recreation - Rockwell Pavilion - Total	\$1,068.8	(\$20.0)	\$1,048.8	0.1	251.5	\$161.2	\$26.9	5.6 Years	11.27%	\$2,997.41	18.84%	1,690.51
Parks and Recreation - Bathhouse - Interior	\$575.0	\$0.0	\$575.0	0.8	376.0	\$114.5	\$212.6	1.8 Years	50.22%	\$2,130.13	59.81%	4,188.67
Parks and Recreation - Bathhouse - Exterior	\$743.2	\$0.0	\$743.2	0.0	200.6	\$61.1	\$0.4	12.1 Years	1.60%	\$1,136.22	5.49%	151.80
Parks and Recreation - Bathhouse - Total	\$1,318.2	\$0.0	\$1,318.2	0.8	576.6	\$175.6	\$212.9	3.4 Years	22.81%	\$3,266.34	31.74%	4,340.47
Parks and Recreation - Muzzy Field - Interior	\$6,839.9	(\$300.0)	\$6,539.9	1.8	898.9	\$510.2	\$0.0	12.8 Years	1.13%	\$9,488.93	4.69%	890.00
Parks and Recreation - Muzzy Field - Exterior	\$5,849.2	\$0.0	\$5,849.2	1.5	748.5	\$424.8	\$0.0	13.8 Years	0.60%	\$7,901.72	3.73%	337.93
Parks and Recreation - Muzzy Field - Total	\$12,689.1	(\$300.0)	\$12,389.1	3.3	1,647.4	\$935.0	\$0.0	13.2 Years	0.88%	\$17,390.65	4.24%	1,227.93
Parks and Recreation - Ski Lodge - Interior	\$1,495.0	(\$90.0)	\$1,405.0	0.4	213.2	\$68.4	\$51.5	11.7 Years	1.87%	\$1,271.67	5.93%	340.71
Parks and Recreation - Ski Lodge - Exterior	\$1,486.4	\$0.0	\$1,486.4	0.1	46.0	\$14.8	\$0.7	96.0 Years	(5.63%)	\$274.37	(15.20%)	(1,260.91)
Parks and Recreation - Ski Lodge - Total	\$2,981.4	(\$90.0)	\$2,891.4	0.5	259.2	\$83.1	\$52.2	21.4 Years	(1.99%)	\$1,546.04	(1.58%)	(920.20)
Parks and Recreation - Page Park Pavilion - Interior	\$4,010.6	(\$200.0)	\$3,810.6	0.8	380.0	\$169.2	\$79.9	15.3 Years	(0.13%)	\$3,146.87	2.37%	(182.59)
Parks and Recreation - Page Park Pavilion - Exterior	\$1,486.4	\$0.0	\$1,486.4	0.1	403.0	\$179.4	\$0.7	8.2 Years	5.45%	\$3,337.35	11.36%	1,137.43
Parks and Recreation - Page Park Pavilion - Total	\$5,497.0	(\$200.0)	\$5,297.0	0.9	782.9	\$348.6	\$0.0	15.2 Years	(0.08%)	\$6,484.22	2.46%	(219.80)
Parks and Recreation - Recreation Building - Interior	\$293.3	\$0.0	\$293.3	0.5	266.0	\$232.3	\$116.5	0.8 Years	112.28%	\$4,320.49	121.94%	4,786.45
Parks and Recreation - Recreation Building - Exterior	\$743.2	\$0.0	\$743.2	0.0	201.5	\$176.0	\$0.4	4.2 Years	17.06%	\$3,272.53	25.50%	1,824.54
Parks and Recreation - Recreation Building - Total	\$1,036.4	\$0.0	\$1,036.4	0.6	467.5	\$408.3	\$0.0	2.5 Years	32.72%	\$7,593.01	42.07%	4,908.95

* Additional incentives, based on eligibility, are available through CL&P, see Appendix K.
**3% yearly inflation on electricity costs
***See Appendix L & M for ECRM Financial Analyses

4.2.5 Bristol Fire Department Lighting System Improvements

It is recommended that the existing lighting systems at the following facilities be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade, as presented in Appendix G, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems.

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix G for a line-by-line proposed detailed lighting upgrades list.

The following table, Table 4.2-5, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Bristol Fire Department Buildings.

Table 4.2-5 Bristol Fire Lighting System Improvements***												
	Engineer's Opinion of Probable Cost	CL&P Rebate	Total Cost	Annual kW Savings	Annual kWh Savings	Annual Energy Savings	Annual Maintenance Cost Savings (AMCS)	Simple Payback	Annual Return on Investment (AROI)	Lifetime Energy Savings (15 years)**	Internal Rate of Return (IRR)	Net Present Value (NPV)
Bristol Fire - Fire HQ - Interior	\$1,702.0	(\$120.0)	\$1,582.0	0.2	255.3	\$44.7	\$0.0	35.4 Years	(3.84%)	\$831.40	(6.77%)	(931.01)
Bristol Fire - Fire HQ - Exterior	\$4,459.1	\$0.0	\$4,459.1	0.3	1,208.9	\$211.7	\$66.4	16.0 Years	(0.43%)	\$3,936.92	1.79%	(409.05)
Bristol Fire - Fire HQ - Total	\$6,161.1	(\$120.0)	\$6,041.1	0.5	1,464.2	\$256.4	\$0.0	23.6 Years	(2.42%)	\$4,768.32	(2.65%)	(2,307.49)
Bristol Fire - Engine 2 - Interior	\$71.9	\$0.0	\$71.9	0.1	435.2	\$82.9	\$0.0	0.9 Years	108.69%	\$1,542.02	118.35%	1,135.54
Bristol Fire - Engine 2 - Exterior	\$3,576.5	\$0.0	\$3,576.5	1.6	6,832.8	\$1,301.6	\$0.0	2.7 Years	(1.74%)	\$32,104.26	(1.00%)	(1,008.77)
Bristol Fire - Engine 2 - Total	\$3,648.4	\$0.0	\$3,648.4	1.7	7,268.0	\$1,384.6	\$0.0	2.6 Years	31.28%	\$35,486.42	40.59%	16,515.09
Bristol Fire - Engine 3 - Interior	\$940.8	(\$60.0)	\$880.8	0.2	899.8	\$181.8	\$0.0	4.8 Years	(1.59%)	\$3,382.17	(0.67%)	(229.85)
Bristol Fire - Engine 3 - Exterior	\$4,470.6	\$0.0	\$4,470.6	2.0	8,541.0	\$1,726.1	\$66.4	2.5 Years	(0.45%)	\$32,104.26	1.75%	(420.55)
Bristol Fire - Engine 3 - Total	\$5,411.5	(\$60.0)	\$5,351.5	2.2	9,440.8	\$1,908.0	\$0.0	2.8 Years	(1.88%)	\$35,486.42	(1.32%)	(1,617.84)
Bristol Fire - Engine 4 - Interior	\$507.4	(\$40.0)	\$467.4	0.0	22.8	\$4.3	\$0.0	108.1 Years	(5.74%)	\$80.41	(16.09%)	(404.47)
Bristol Fire - Engine 4 - Exterior	\$5,202.3	\$0.0	\$5,202.3	0.3	1,410.4	\$267.3	\$0.0	19.5 Years	(1.53%)	\$4,970.81	(0.53%)	(1,310.13)
Bristol Fire - Engine 4 - Total	\$5,709.8	(\$40.0)	\$5,669.8	0.3	1,433.2	\$271.6	\$0.0	20.9 Years	(1.88%)	\$5,051.22	(1.32%)	(1,714.60)
Bristol Fire - Engine 5 - Interior	\$1,084.6	(\$60.0)	\$1,024.6	0.4	2,934.9	\$582.0	\$119.6	1.5 Years	61.81%	\$10,824.36	71.44%	9,192.34
Bristol Fire - Engine 5 - Exterior	\$5,062.9	\$0.0	\$5,062.9	1.8	7,700.0	\$1,526.9	\$1.1	3.3 Years	23.51%	\$28,399.02	32.49%	17,189.53
Bristol Fire - Engine 5 - Total	\$6,147.5	(\$60.0)	\$6,087.5	2.2	10,634.9	\$2,108.9	\$120.7	2.7 Years	29.96%	\$39,223.37	39.23%	26,381.87

* Additional incentives, based on eligibility, are available through CL&P, see Appendix K.
**3% yearly inflation on electricity costs
***See Appendix L & M for ECRM Financial Analyses

4.2.6 Senior Center Lighting System Improvements

It is recommended that the existing lighting systems at the following facilities be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade, as presented in Appendix G, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems.

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix G for a line-by-line proposed detailed lighting upgrades list.

The following table, Table 4.2-6, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Senior Center.

Table 4.2-6 Senior Center Lighting System Improvements***												
	Engineer's Opinion of Probable Cost	CL&P Rebate	Total Cost	Annual kW Savings	Annual kWh Savings	Annual Energy Savings	Annual Maintenance Cost Savings (AMCS)	Simple Payback	Annual Return on Investment (AROI)	Lifetime Energy Savings (15 years)**	Internal Rate of Return (IRR)	Net Present Value (NPV)
Senior Center - Interior	\$1,448.3	(\$100.0)	\$1,348.3	0.2	737.2	\$142.9	\$66.4	6.4 Years	8.86%	\$2,658.52	15.87%	1,700.79
Senior Center - Exterior	\$19,394.8	\$0.0	\$19,394.8	1.3	5,650.2	\$1,095.6	\$26.6	17.3 Years	(0.88%)	\$20,376.48	0.87%	(3,052.82)
Senior Center - Total	\$20,843.0	(\$100.0)	\$20,743.0	1.5	6,387.4	\$1,238.5	\$93.0	15.6 Years	(0.25%)	\$23,035.01	2.14%	(1,352.03)

* Additional incentives, based on eligibility, are available through CL&P, see Appendix K.
**3% yearly inflation on electricity costs
***See Appendix L & M for ECRM Financial Analyses

4.2.7 Bristol Library Department Lighting System Improvements

It is recommended that the existing lighting systems at the following facilities be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade, as presented in Appendix G, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems.

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix G for a line-by-line proposed detailed lighting upgrades list.

The following table, Table 4.2-7, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Senior Center.

Table 4.2-7 Bristol Library Department Lighting System Improvements***												
	Engineer's Opinion of Probable Cost	CL&P Rebate	Total Cost	Annual kW Savings	Annual kWh Savings	Annual Energy Savings	Annual Maintenance Cost Savings (AMCS)	Simple Payback	Annual Return on Investment (AROI)	Lifetime Energy Savings (15 years)**	Internal Rate of Return (IRR)	Net Present Value (NPV)
Main Library - Interior	\$3,044.6	(\$240.0)	\$2,804.6	0.0	433.5	\$75.6	\$0.0	37.1 Years	(3.97%)	\$1,405.27	(7.22%)	(1,704.29)
Main Library - Exterior	\$3,715.9	\$0.0	\$3,715.9	0.3	1,392.8	\$242.8	\$0.0	15.3 Years	(0.13%)	\$4,515.30	2.37%	(180.42)
Main Library - Total	\$6,760.6	(\$240.0)	\$6,520.6	0.3	1,826.3	\$318.3	\$0.0	20.5 Years	(1.78%)	\$5,920.56	(1.11%)	(1,884.71)
Public Library - Interior	\$723.1	(\$40.0)	\$683.1	0.3	828.6	\$129.6	\$79.7	3.3 Years	23.98%	\$2,410.40	32.98%	2,365.21
Public Library - Exterior	\$3,859.7	\$0.0	\$3,859.7	0.4	1,830.8	\$286.3	\$53.1	11.4 Years	2.13%	\$5,325.68	6.37%	1,084.30
Public Library - Total	\$4,582.8	(\$40.0)	\$4,542.8	0.7	2,659.5	\$415.9	\$132.9	8.3 Years	5.41%	\$7,736.08	11.31%	3,449.52

* Additional incentives, based on eligibility, are available through CL&P, see Appendix K.
**3% yearly inflation on electricity costs
***See Appendix L & M for ECRM Financial Analyses

4.2.8 Youth Services Lighting System Improvements

It is recommended that the existing lighting systems at the following facilities be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade, as presented in Appendix G, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems.

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix G for a line-by-line proposed detailed lighting upgrades list.

The following table, Table 4.2-8, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at Youth Services Building.

Table 4.2-8 Youth Services Lighting System Improvements***												
	Engineer's Opinion of Probable Cost	CL&P Rebate	Total Cost	Annual kW Savings	Annual kWh Savings	Annual Energy Savings	Annual Maintenance Cost Savings (AMCS)	Simple Payback	Annual Return on Investment (AROI)	Lifetime Energy Savings (15 years)**	Internal Rate of Return (IRR)	Net Present Value (NPV)
Youth Services - Main Building - Interior	\$1,230.5	(\$80.0)	\$1,150.5	0.3	359.6	\$110.1	\$79.7	6.1 Years	9.83%	\$2,047.19	17.08%	1,613.38
Youth Services - Main Building - Exterior	\$2,229.6	\$0.0	\$2,229.6	0.1	604.4	\$185.0	\$0.0	12.1 Years	1.63%	\$3,441.15	5.54%	464.89
Youth Services - Main Building - Total	\$3,460.1	(\$80.0)	\$3,380.1	0.4	964.0	\$295.1	\$79.7	9.0 Years	4.42%	\$5,488.35	9.89%	2,078.27

* Additional incentives, based on eligibility, are available through CL&P, see Appendix K.
**3% yearly inflation on electricity costs
***See Appendix L & M for ECRM Financial Analyses

4.2.9 Public Works Department Lighting System Improvements

It is recommended that the existing lighting systems at the following facilities be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade, as presented in Appendix G, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems.

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix G for a line-by-line proposed detailed lighting upgrades list.

The following table, Table 4.2-9, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Public Works Department Buildings.

Table 4.2-9 Public Works Lighting System Improvements***												
	Engineer's Opinion of Probable Cost	CL&P Rebate	Total Cost	Annual kW Savings	Annual kWh Savings	Annual Energy Savings	Annual Maintenance Cost Savings (AMCS)	Simple Payback	Annual Return on Investment (AROI)	Lifetime Energy Savings (15 years)**	Internal Rate of Return (IRR)	Net Present Value (NPV)
Public Works - Community - Interior	\$543.4	(\$40.0)	\$503.4	0.0	36.9	\$7.0	\$26.6	15.0 Years	0.01%	\$131.01	2.64%	(13.82)
Public Works - Community - Total	\$543.4	(\$40.0)	\$503.4	0.0	36.9	\$7.0	\$26.6	15.0 Years	0.01%	\$131.01	2.64%	(13.82)
Public Works - Hill Street - Interior	\$4,125.9	(\$160.0)	\$3,965.9	1.2	691.7	\$787.7	\$54.2	4.7 Years	14.56%	\$14,650.72	22.69%	8,295.17
Public Works - Hill Street - Exterior	\$743.2	\$0.0	\$743.2	0.1	394.2	\$448.9	\$52.0	1.5 Years	(6.52%)	\$45,580.61	(27.89%)	(727.19)
Public Works - Hill Street - Total	\$4,869.1	(\$160.0)	\$4,709.1	1.2	1,085.9	\$1,236.6	\$54.2	3.6 Years	20.74%	\$45,580.61	29.53%	14,089.58
Public Works - City Yard - Exterior	\$12,864.2	\$0.0	\$12,864.2	2.8	12,465.5	\$2,450.7	\$0.0	5.2 Years	(6.46%)	\$45,580.61	(25.95%)	(12,477.22)
Public Works - City Yard - Total	\$12,864.2	\$0.0	\$12,864.2	2.8	12,465.5	\$2,450.7	\$0.0	5.2 Years	(6.41%)	\$45,580.61	(24.54%)	(12,374.63)
Public Works - Transfer Station Scale House - Exterior	\$2,229.6	\$0.0	\$2,229.6	0.2	836.6	\$164.5	\$1.1	13.5 Years	0.76%	\$3,058.99	4.02%	181.39
Public Works - Transfer Station Scale House - Total	\$2,229.6	\$0.0	\$2,229.6	0.2	836.6	\$164.5	\$1.1	13.5 Years	0.76%	\$3,058.99	4.02%	181.39
Public Works - Transfer Station Hut - Interior	\$3,217.1	\$0.0	\$3,217.1	1.4	3,329.7	\$1,456.1	\$0.0	2.2 Years	38.59%	\$27,081.17	48.06%	17,987.66
Public Works - Transfer Station Hut - Exterior	\$1,637.3	\$0.0	\$1,637.3	0.3	1,265.8	\$553.5	\$0.4	3.0 Years	27.16%	\$10,295.30	36.33%	6,429.31
Public Works - Transfer Station Hut - Total	\$4,854.4	\$0.0	\$4,854.4	1.7	4,595.5	\$2,009.6	\$0.4	2.4 Years	34.74%	\$37,376.47	44.14%	24,416.97

* Additional incentives, based on eligibility, are available through CL&P, see Appendix K.
**3% yearly inflation on electricity costs
***See Appendix L & M for ECRM Financial Analyses

4.2.10 Water Pollution Control Lighting System Improvements

It is recommended that the existing lighting systems at the following facilities be upgraded to high efficiency standards to create lighting uniformity throughout the building. In general, the recommended lighting upgrade, as presented in Appendix G, involves replacing existing inefficient bulbs, and installing new energy-efficient luminaires to the existing lighting systems.

The strategies included in this section focus on maximizing energy savings and maintaining or exceeding existing lighting levels, while also maintaining the existing look of each fixture; therefore, proposed lamp styles remain consistent with existing lamp styles. Please refer to Appendix G for a line-by-line proposed detailed lighting upgrades list.

The following table, Table 4.2-10, summarizes a simple payback analysis assuming the implementation of all recommended lighting system improvements at the Water Pollution Control Buildings.

Table 4.2-10 Water Pollution Control Lighting System Improvements***												
	Engineer's Opinion of Probable Cost	CL&P Rebate	Total Cost	Annual kW Savings	Annual kWh Savings	Annual Energy Savings	Annual Maintenance Cost Savings (AMCS)	Simple Payback	Annual Return on Investment (AROI)	Lifetime Energy Savings (15 years)**	Internal Rate of Return (IRR)	Net Present Value (NPV)
Water Pollution Control - Operations - Interior	\$35.9	\$0.0	\$35.9	0.0	23.5	\$3.6	\$13.3	2.1 Years	40.37%	\$67.31	49.87%	210.25
Water Pollution Control - Operations- Total	\$35.9	\$0.0	\$35.9	0.0	23.5	\$3.6	\$13.3	2.1 Years	40.37%	\$67.31	49.87%	210.25
Water Pollution Control - Headworks - Exterior	\$1,486.4	\$0.0	\$1,486.4	0.1	403.0	\$62.1	\$0.7	23.7 Years	(2.44%)	\$1,154.17	(2.70%)	(572.02)
Water Pollution Control - Headworks - Total	\$1,486.4	\$0.0	\$1,486.4	0.1	403.0	\$62.1	\$0.7	23.7 Years	(2.44%)	\$1,154.17	(2.70%)	(572.02)
Water Pollution Control - Air Blower - Exterior	\$2,229.6	\$0.0	\$2,229.6	0.1	604.4	\$93.1	\$0.0	24.0 Years	(2.49%)	\$1,731.26	(2.83%)	(873.97)
Water Pollution Control - Air Blower - Total	\$2,229.6	\$0.0	\$2,229.6	0.1	604.4	\$93.1	\$1.1	23.7 Years	(2.44%)	\$1,731.26	(2.70%)	(858.03)
Water Pollution Control - Pump House - Exterior	\$1,486.4	\$0.0	\$1,486.4	0.1	403.0	\$62.1	\$0.0	24.0 Years	(6.67%)	\$1,621.10	NA	(1,486.38)
Water Pollution Control - Pump House - Total	\$1,486.4	\$0.0	\$1,486.4	0.1	403.0	\$62.1	\$0.7	23.7 Years	(2.44%)	\$1,621.10	(2.70%)	(572.02)
Water Pollution Control - Sludge Thickening Building - Exterior	\$3,425.6	\$0.0	\$3,425.6	0.8	566.0	\$87.2	\$0.0	39.3 Years	(3.95%)	\$1,621.10	(7.14%)	(2,069.97)
Water Pollution Control - Sludge Thickening Building - Total	\$3,425.6	\$0.0	\$3,425.6	0.8	566.0	\$87.2	\$0.0	39.3 Years	(3.92%)	\$1,621.10	(7.03%)	(2,054.03)
Water Pollution Control - Broad Street PS - Interior	\$416.9	(\$20.0)	\$396.9	0.1	3.6	\$0.6	\$6.1	58.9 Years	(4.97%)	\$11.48	(11.31%)	(298.71)
Water Pollution Control - Broad Street PS - Total	\$416.9	(\$20.0)	\$396.9	0.1	3.6	\$0.6	\$6.1	58.9 Years	(4.97%)	\$11.48	(11.31%)	(298.71)
Water Pollution Control - Cherry Hill PS - Interior	\$416.9	(\$20.0)	\$396.9	0.1	3.6	\$0.8	\$6.1	57.7 Years	(4.93%)	\$14.15	(11.13%)	(296.62)
Water Pollution Control - Cherry Hill PS - Total	\$416.9	(\$20.0)	\$396.9	0.1	3.6	\$0.8	\$6.1	57.7 Years	(4.93%)	\$14.15	(11.13%)	(296.62)
Water Pollution Control - Cross PS - Interior	\$833.8	(\$40.0)	\$793.8	0.1	7.1	\$1.3	\$12.2	58.5 Years	(4.96%)	\$24.43	(11.26%)	(596.27)
Water Pollution Control - Cross PS - Total	\$833.8	(\$40.0)	\$793.8	0.1	7.1	\$1.3	\$12.2	58.5 Years	(4.96%)	\$24.43	(11.26%)	(596.27)
Water Pollution Control - Drayla PS - Interior	\$833.8	(\$40.0)	\$793.8	0.1	7.1	\$9.0	\$12.2	37.3 Years	(3.99%)	\$167.75	(7.27%)	(484.06)
Water Pollution Control - Drayla PS - Total	\$833.8	(\$40.0)	\$793.8	0.1	7.1	\$9.0	\$12.2	37.3 Years	(3.99%)	\$167.75	(7.27%)	(484.06)
Water Pollution Control - East Main PS - Interior	\$208.4	(\$10.0)	\$198.4	0.0	1.8	\$0.3	\$3.1	58.5 Years	(4.96%)	\$6.15	(11.25%)	(149.04)
Water Pollution Control - East Main PS - Total	\$208.4	(\$10.0)	\$198.4	0.0	1.8	\$0.3	\$3.1	58.5 Years	(4.96%)	\$6.15	(11.25%)	(149.04)
Water Pollution Control - Ivy PS - Interior	\$208.4	(\$10.0)	\$198.4	0.0	1.8	\$0.3	\$3.1	58.7 Years	(4.96%)	\$5.89	(11.29%)	(149.24)
Water Pollution Control - Ivy PS - Total	\$208.4	(\$10.0)	\$198.4	0.0	1.8	\$0.3	\$3.1	58.7 Years	(4.96%)	\$5.89	(11.29%)	(149.24)
Water Pollution Control - Julia PS - Interior	\$208.4	(\$10.0)	\$198.4	0.0	1.8	\$0.3	\$3.1	58.9 Years	(4.97%)	\$5.75	(11.31%)	(149.35)
Water Pollution Control - Julia PS - Total	\$208.4	(\$10.0)	\$198.4	0.0	1.8	\$0.3	\$3.1	58.9 Years	(4.97%)	\$5.75	(11.31%)	(149.35)
Water Pollution Control - Lake PS - Interior	\$208.4	(\$10.0)	\$198.4	0.0	1.8	\$0.5	\$3.1	56.5 Years	(4.90%)	\$8.38	(10.96%)	(147.29)
Water Pollution Control - Lake PS - Total	\$208.4	(\$10.0)	\$198.4	0.0	1.8	\$0.5	\$3.1	56.5 Years	(4.90%)	\$12.66	(10.96%)	(147.29)
Water Pollution Control - Lufkin PS - Interior	\$208.4	(\$10.0)	\$198.4	0.0	1.8	\$0.7	\$0.0	53.0 Years	(4.97%)	\$12.66	(11.10%)	(149.35)
Water Pollution Control - Lufkin PS - Total	\$208.4	(\$10.0)	\$198.4	0.0	1.8	\$0.7	\$0.0	53.0 Years	(4.97%)	\$12.66	(11.10%)	(149.35)
Water Pollution Control - Matthews PS - Interior	\$625.3	(\$30.0)	\$595.3	0.1	5.3	\$1.0	\$9.2	58.5 Years	(4.96%)	\$18.49	(11.25%)	(447.07)
Water Pollution Control - Matthews PS - Total	\$625.3	(\$30.0)	\$595.3	0.1	5.3	\$1.0	\$9.2	58.5 Years	(4.96%)	\$18.49	(11.25%)	(447.07)
Water Pollution Control - Middle PS - Interior	\$625.3	(\$30.0)	\$595.3	0.1	5.3	\$1.0	\$9.2	58.2 Years	(4.95%)	\$19.34	(11.21%)	(446.41)

Water Pollution Control - Middle PS - Total	\$625.3	(\$30.0)	\$595.3	0.1	5.3	\$1.0	\$9.2	58.2 Years	(4.95%)	\$19.34	(11.21%)	(446.41)
Water Pollution Control - Minor PS - Interior	\$625.3	(\$30.0)	\$595.3	0.1	5.3	\$1.0	\$9.2	58.7 Years	(4.96%)	\$17.78	(11.28%)	(447.63)
Water Pollution Control - Minor PS - Total	\$625.3	(\$30.0)	\$595.3	0.1	5.3	\$1.0	\$9.2	58.7 Years	(4.96%)	\$17.78	(11.28%)	(447.63)
Water Pollution Control - Boivin PS - Interior	\$416.9	(\$20.0)	\$396.9	0.1	3.6	\$0.6	\$6.1	58.7 Years	(4.96%)	\$11.96	(11.27%)	(298.33)
Water Pollution Control - Boivin PS - Total	\$416.9	(\$20.0)	\$396.9	0.1	3.6	\$0.6	\$6.1	58.7 Years	(4.96%)	\$11.96	(11.27%)	(298.33)
Water Pollution Control - Tyler PS - Interior	\$625.3	(\$30.0)	\$595.3	0.1	5.3	\$1.0	\$9.2	58.2 Years	(4.95%)	\$19.36	(11.21%)	(446.39)
Water Pollution Control - Tyler PS - Total	\$625.3	(\$30.0)	\$595.3	0.1	5.3	\$1.0	\$9.2	58.2 Years	(4.95%)	\$19.36	(11.21%)	(446.39)

* Additional incentives, based on eligibility, are available through CL&P, see Appendix K.
**3% yearly inflation on electricity costs
***See Appendix L & M for ECRM Financial Analyses

4.3 HVAC Systems

The goal of this section is to present any heating and cooling energy reduction and cost saving measures that may also be cost beneficial. Where possible, measures will be presented with a life-cycle cost analysis. This analysis displays a payback period based on weighing the capital cost of the measure against predicted annual fiscal savings. To do this, the buildings have been modeled as accurately as possible to predict energy usage for space heating and cooling, as well as domestic hot water use.

Each building is modeled using software to establish a baseline space heating and cooling energy usage. This software is typically either bin hour based spreadsheets or eQuest, a Department of Energy-sponsored energy modeling program. Climate data from Hartford, CT was used for analyses. From this, the model may be calibrated, using historical utility bills, to predict the impact of theoretical energy savings measures.

Buildings that had relatively simple HVAC systems were not modeled with eQuest. Spreadsheet models were used for the simple systems, but were still calibrated within 10% of the fuel and/or electric usage. The spreadsheet models are provided in Appendix E.

Once annual energy savings from a particular measure have been predicted and the initial capital cost has been estimated, payback periods may be approximated. The results of the eQuest models are provided in Appendix F. The equipment cost estimate calculations that are utilized in the economic analyses presented here are provided in Appendix L.

Over several decades, ASHRAE has compiled data pertaining to service lives of most HVAC related equipment. From this, ASHRAE indicates a median service life (life until replacement) for HVAC related equipment that may be used as an estimate for the useful life of HVAC equipment currently in service. For example, ASHRAE indicates a window air conditioning unit has a median service life of 10 years. Therefore, if a window unit has been in service for more than 10 years, the owner may want to consider replacement. Not only will a replacement ensure minimal downtime between units (the unit is replaced before it ceases to function), but it will also maintain rated system efficiency, as efficiency tends to decrease with age.

All major equipment noted during CDM's on site audit is listed in Appendix D per facility, along with estimated current ages and ASHRAE-expected service lives. It should be noted that only equipment that was observed at the time of the audit is included. Where equipment ages were not found on the equipment tags, they have been estimated based on the unit appearance or approximate renovation dates. In some cases, service locations may have been estimated based on unit proximity. Additionally, in cases where a unit's manufacturer and/or model could not be determined due to an unreadable, faded, destroyed, or lost tag, manufacturer and model number information has been represented as "unknown".

4.3.1 City Hall HVAC Improvements

A model of the City Hall Building was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity bills from March, 2009 through September, 2010, and oil from January 2007 to May 2010. Figure 4.3.1-1 below compares actual monthly electricity usages, with those predicted by the eQuest model. Historical monthly usages were averaged for each month observed over multiple years. For example, usage during the month of June was averaged for the two years, to yield an approximate average usage during the month of June. The annual predicted electricity usage was within 1% of the actual usage.

Figure 4.3.1-1: City Hall Building Electricity Usage

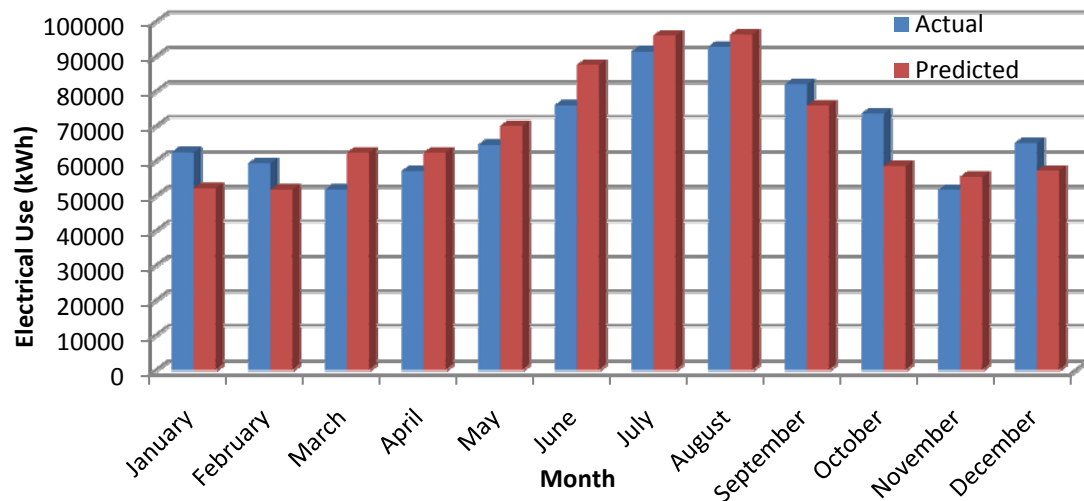
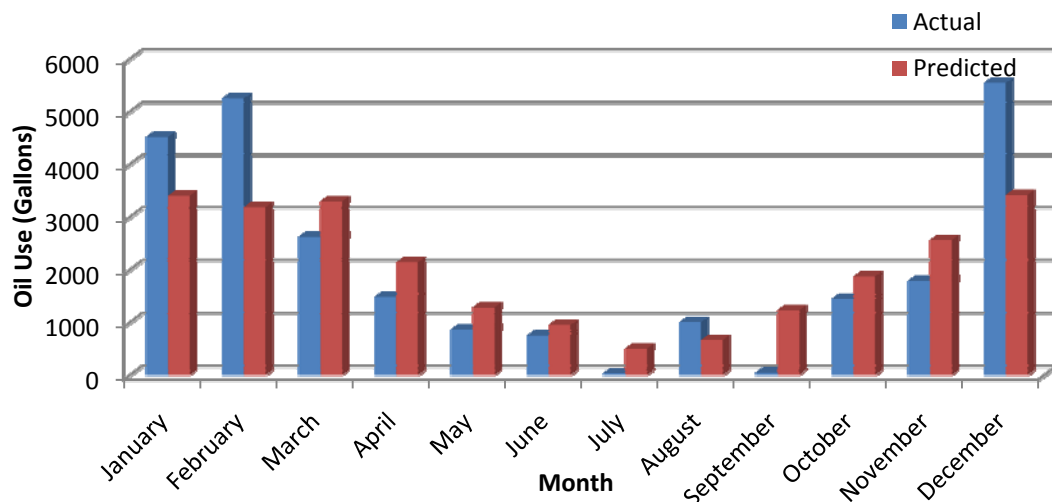


Figure 4.3.1-2 below compares actual oil usage to model-predicted oil use. The annual predicted oil usage was modeled within 4% of the actual usage.

Figure 4.3.1-2: City Hall Building Oil Usage



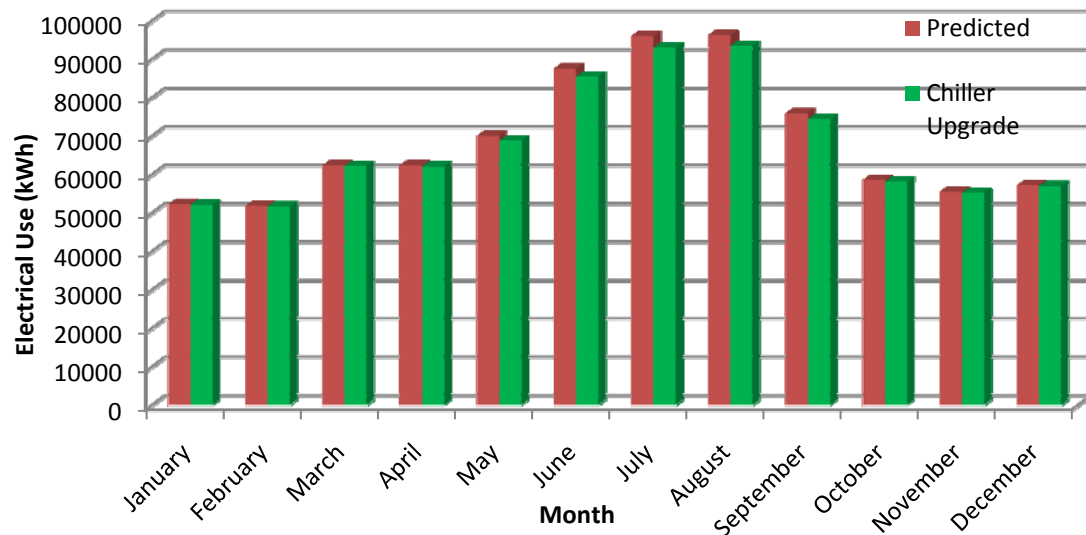
4.3.1.1 City Hall Chiller Replacement

It is recommended that the existing central chiller be replaced with a high efficiency unit. This new unit shall be variable speed rotary compressor. The new unit shall have a water cooled condenser that will be connected to the existing evaporative cooling tower. The new unit shall have a COP (coefficient of performance) of 4.9 and IPLV of 5.60. The replacement chiller was sized at approximately 180 tons.

The existing chiller is past the unit's expected life and is due to be replaced. During the site visit, the chiller discharge water temperature was not matching set point. If the chilled water is not cold enough, space cooling is not sufficient.

CDM modeled the existing chiller with a COP of 4.2. Figure 4.3.1.1-1 demonstrates the anticipated monthly electricity usage realized from an upgrade to a high efficiency chiller.

Figure 4.3.1.1-1: City Hall - Chiller Upgrade - Electricity Usage



Resulting anticipated savings and payback are shown in Table 4.3.1.1-1.

Table 4.3.1.1-1: City Hall Chiller Upgrade Payback	
Predicted Annual Savings (kWh)	12,350
Total Annual Savings	\$2,175
Initial Capital Cost of Upgrade	\$212,756
Incentives	0
Cost of Upgrade	\$212,756
Simple Payback	97.8
Lifetime Energy Savings (24 years)*	\$74,878
Annual Maintenance Cost Savings (AMCS)	\$0

Table 4.3.1.1-1: City Hall Chiller Upgrade Payback	
Annual Return on Investment (AROI)	(3.14%)
Internal Rate of Return (IRR)	(6.56%)
Net Present Value (NPV)	(\$162,076)

*Assumes 3% yearly inflation on electricity costs

**Incentives for chillers exceeding 100 tons are granted on a case by case basis, per CL&P

4.3.1.2 Pipe Insulation Improvements

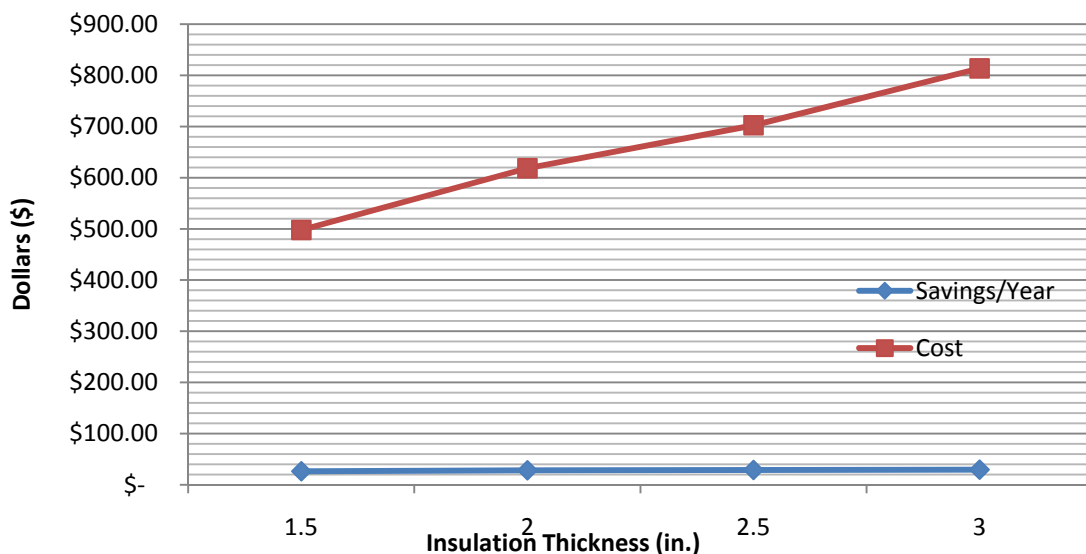
It is recommended to install and repair pipe insulation in the city hall buildings. These improvements include; insulating the cooling tower make-up water pipe that is heat traced, and repairing wet chilled water pipe insulation.

The insulation on the make-up water pipe will reduce the heat required to keep the pipe from freezing. The chilled water piping insulation is wet because the insulation does not have a continuous air/moisture barrier. The wet summer air condenses, making the insulation wet. The moisture conducts the cold through the insulation reducing its effectiveness.

3E Plus is an insulation thickness computer program and was used to estimate the savings. The make-up water is assumed to be maintained at 40 degrees F, and the ambient temperature surrounding the piping is assumed to be at an average of 20 degrees F throughout the winter. The existing pipe diameter of 1.5" was used for the calculation. The chilled water is assumed to be maintained at 50 degrees F, and the ambient temperature surrounding the piping is assumed to be at an average of 80 degrees F throughout the summer. The existing pipe diameter of 3" was used for the calculation. 2,000 run time hours were used for the two calculations. Mineral Fiber insulation with an all service jacket was the material input.

A series of insulation thicknesses between 1.5" to 3" were evaluated to find the shortest payback. Figure 4.3.1.2-1 shows the savings and cost associated with each insulation thickness.

Figure 4.3.1.2-1: City Hall – Pipe Insulation Savings



Fiscal savings from the 1.5" insulation addition to the piping are then identified in Table 4.3.1.2-1 below. Lifetime savings calculations for all ECRM's may be found in Appendix L. It's important to note that these are estimates based on building models and simulation software. Further investigation of insulation material, thickness and savings is warranted before pursuing installation.

Table 4.3.1.2-1: City Hall Pipe Insulation Payback	
Predicted Annual Savings (kWh)	150
Total Annual Savings	\$26
Initial Capital Cost of Upgrade	\$497
Incentives	\$0
Cost of Upgrade	\$497
Simple Payback	19.1
Lifetime Energy Savings (24 years)*	\$895
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	1.06%
Internal Rate of Return (IRR)	4.70%
Net Present Value (NPV)	\$109

*Assumes 3% yearly inflation on electric costs

4.3.1.3 Building Control System Upgrade

It is recommended that the existing pneumatic controls and actuator be replaced with electronic DDC. The chiller controls must also be converted to digital to ensure that the chiller will achieve the set point called for by the building control system.

Currently, HVAC units at the City Hall are controlled by a pneumatic system. Unless recalibrated at least annually, the accuracy of pneumatic system controls tends to "wander" over time. Thus, a switch to full digital control should be considered for consistency and maintenance purposes. In addition, removal of a pneumatic system will allow for the de-commissioning of the pneumatic system compressor. Consolidating control of these units into one central building management system (BMS) with direct digital controls (DDC) may provide significant energy savings. A consolidated DDC building management system typically tends to offer a 10% energy savings over independent unit controls. A centralized building management system can incorporate real time energy monitoring for all HVAC systems, allowing the city to see exactly how much energy is being used to heat and/or cool the building at any time throughout the year.

CDM was not able to locate any available grants or incentives for consolidating systems and switching to DDC. Despite this, however, this change still offers an attractive payback and is therefore recommended by CDM.

The estimated installed cost, projected energy and cost savings, and simple payback are included in Table 4.3.1.3-1. The model output is included in Appendix F. Electricity savings are estimated to be 10% of the total ventilation, pump, heating and cooling usage. The energy usages and savings are presented below.

Table 4.3.1.3-1: City Hall DDC BMS Payback	
Estimated Annual Heating Usage (Therms)	1,638
Predicted Annual Savings (Therms)	164
Annual Savings (Gas)	\$369
Estimate Annual Heating Usage (Gallons)	24,507
Predicted Annual Savings (Gallons)	2,451
Annual Savings (Oil)	\$4,388
Estimated Annual Cooling Usage (kWh)	116,819
Predicted Annual Savings (kWh)	11,682
Annual Savings (Electricity)	\$2,056
Total Annual Savings	\$6,813
Initial Capital Cost of Upgrade	\$142,589
Incentives	\$0
Cost of Upgrade	\$142,589
Simple Payback	20.9
Lifetime Energy Savings (15 years)*	\$126,714
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	(1.89%)
Internal Rate of Return (IRR)	(1.35%)
Net Present Value (NPV)	(\$43,369)

*Assumes 3% yearly inflation on electric costs; 2% on gas & oil costs

4.3.1.4 Annex Furnace Upgrade

It is recommended that the existing natural gas fired furnaces be replaced with high efficiency condensing furnaces. These furnaces operate at lower exhaust temperatures keeping more heat in the building. The new furnaces shall be the same capacity as the existing furnaces. The existing furnaces have efficiencies ranging from 80-83%. The estimated savings were generated from the condensing furnaces having an efficiency of 93%.

Fiscal savings from such an upgrade are then identified in Table 4.3.1.4-1 below. Lifetime savings calculations for all ECRM's may be found in Appendix L. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing furnace replacements.

Table 4.3.1.4-1: City Hall Annex Furnace Upgrade Payback	
Predicted Annual Savings (Therms)	197
Total Annual Savings	\$463
Initial Capital Cost of Upgrade	\$8,418
Incentives	\$0
Cost of Upgrade	\$8,418
Simple Payback	18.2
Lifetime Energy Savings (18 years)*	\$9,914
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	(0.06%)
Internal Rate of Return (IRR)	2.57%
Net Present Value (NPV)	(\$327)

*Assumes 2% yearly inflation on natural gas costs

4.3.1.5 City Hall CRAC Upgrade

It is recommended that the existing computer room air conditioner with a unit of similar capacity. The new unit shall have an economizer, to cool the room without running the compressor, when outdoor conditions permit. The new unit shall have a COP of 3.5.

The improvement of the compressor technology produces the same amount of cooling with less electricity.

The estimated installed cost, projected energy and cost savings, and simple payback are included in Table 4.3.1.5-1. The supporting calculations are included in Appendix E.

Table 4.3.1.5-1: City Hall CRAC Upgrade Payback	
Predicted Annual Savings (kWh)	21,356
Total Annual Savings	\$3,759
Initial Capital Cost of Upgrade	\$55,452
Incentives	\$0
Cost of Upgrade	\$55,452
Simple Payback	14.7
Lifetime Energy Savings (19 years)*	\$94,414
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	1.52%
Internal Rate of Return (IRR)	5.41%
Net Present Value (NPV)	\$13,889

*Assumes 3% yearly inflation on electric costs

4.3.2 Water Department HVAC Improvements

A model of the Water Department Main Office was created in eQuest to predict heating and cooling loads for the building. The Garage was modeled with a BIN model and the predicted electric usage was added to the annual usage predicted by the eQuest model. To calibrate this model, CDM used electricity bills from March, 2009 through September, 2010, and oil from January 2007 to May 2010. Figure 4.3.2-1 below compares actual monthly electricity usages, with those predicted by the eQuest model. Historical monthly usages were averaged for each month observed over multiple years. For example, usage during the month of June was averaged for the two years, to yield an approximate average usage during the month of June. The annual predicted electricity usage was within 8% of the actual usage.

Figure 4.3.2-1: Water Department Main Office Building Electricity Usage

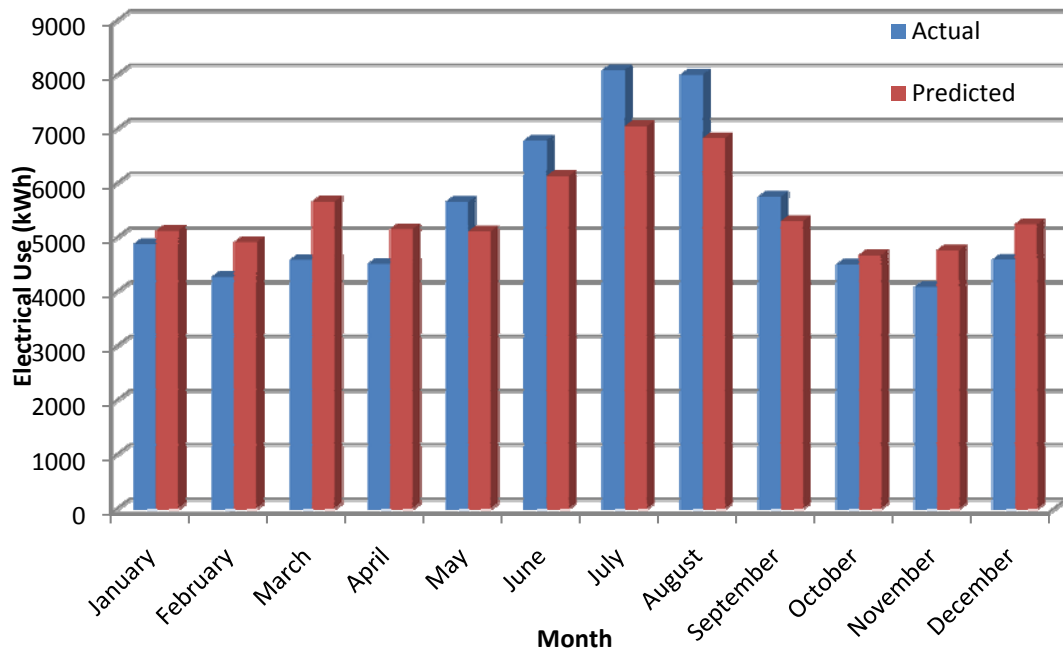
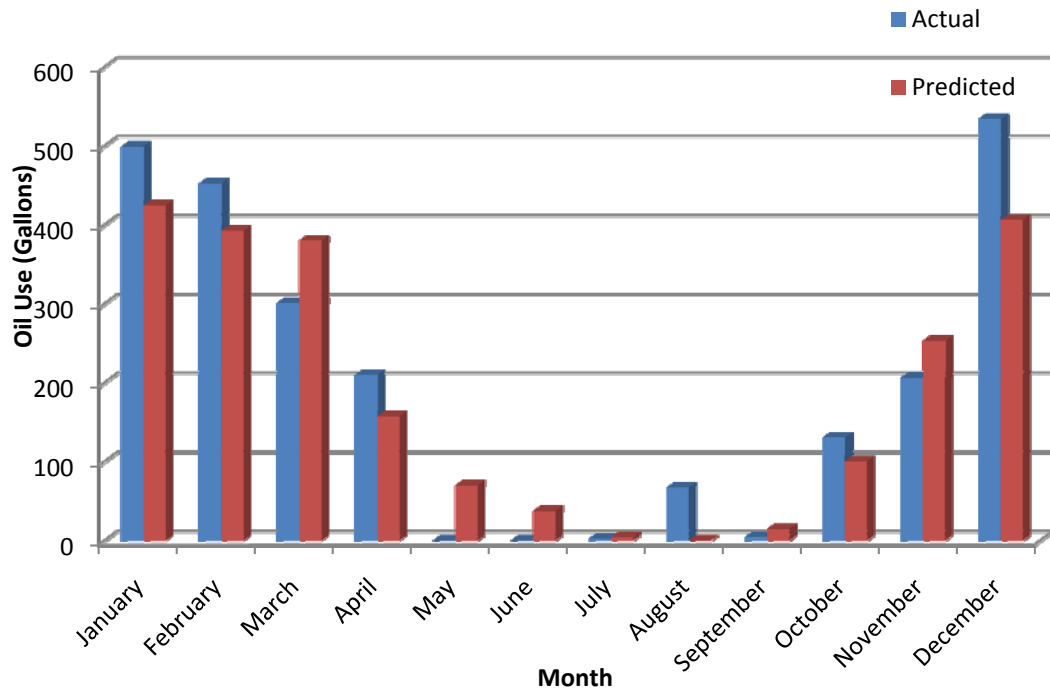


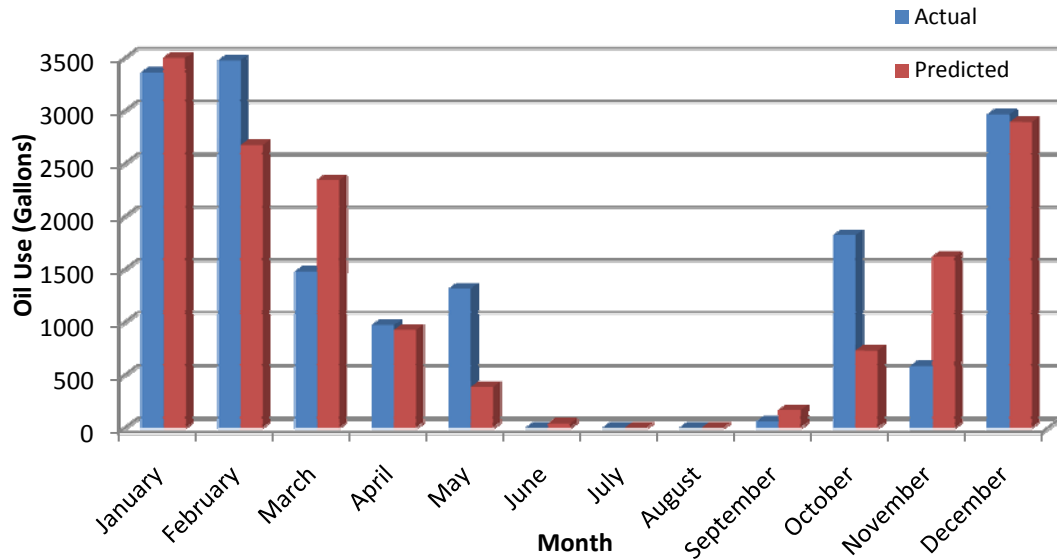
Figure 4.3.2-2 below compares actual oil usage to model-predicted oil use. The annual predicted oil usage was modeled within 7% of the actual usage.

Figure 4.3.2-2: Water Department Main Office Building Oil Usage



The Water Filtration Plant Building and High Service Pump Station is on one electric bill. Modeling all of the buildings and calibrating to the entire plant's electric bill would not be beneficial for estimated electrical usage or energy savings. However, there are two buildings that have oil heating. The two buildings that have oil heating are billed on one account. These buildings are the Water Filtration Plant Building, and the High Service Pump Station. The two buildings were modeled and their predicted oil usages were combined and calibrated to the actual usage. The High Service Pump Station was modeled with a BIN model and the predicted oil usage was added to the annual usage predicted by the eQuest model of the Water Filtration Plant Building. To calibrate the models, CDM used oil bills from November 2007 through April 2010. Figure 4.3.2-3 below compares actual monthly oil usages, with those predicted by the eQUEST model for the Water Filtration Plant Building. The models combined are modeled within 4% of the actual usage.

Figure 4.3.2-3: Water Filtration Plant Building – Oil Usage

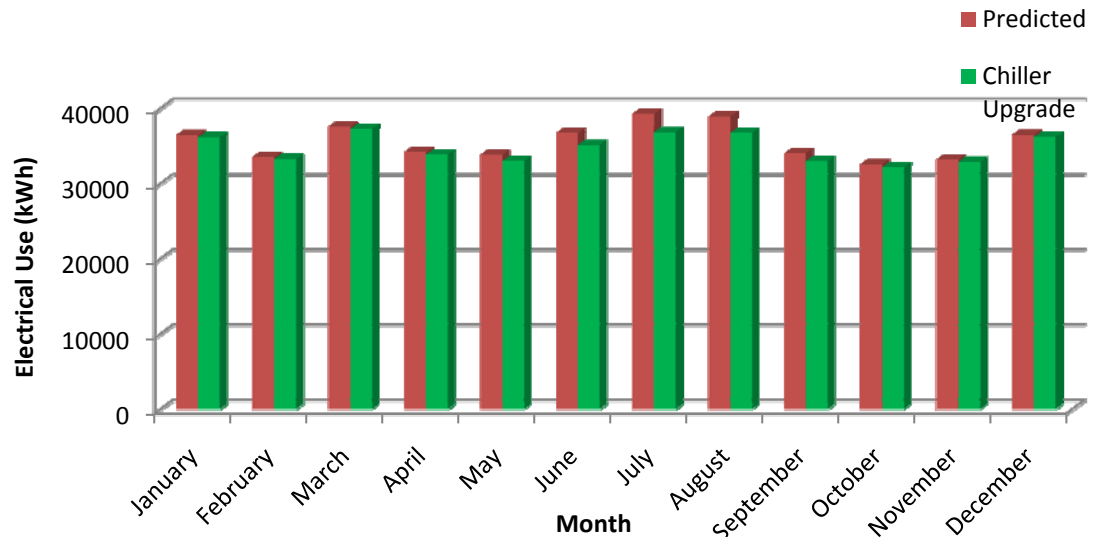


4.3.2.1 Chiller Replacement

It is recommended that the existing central chiller be replaced with a high efficiency unit. This new unit shall be variable speed rotary compressor. The new unit shall have a water cooled condenser that will be connected to the existing condenser water system. The new unit shall have a COP of 4.45 and IPLV of 5.20. The replacement chiller was sized at approximately 180 tons.

CDM modeled the existing chiller with a COP of 3. Figure 4.3.2.1-1 demonstrates the anticipated monthly electricity usage realized from an upgrade to a high efficiency chiller.

Figure 4.3.2.1-1: Water Department – Chiller Upgrade - Electricity Usage



Resulting anticipated savings and payback are shown in Table 4.3.2.1-1.

Table 4.3.2.1-1: Water Department Chiller Upgrade Payback	
Predicted Annual Savings (kWh)	10,280
Total Annual Savings	\$1,609
Initial Capital Cost of Upgrade	\$194,068
Incentives	\$0
Cost of Upgrade	\$194,068
Simple Payback	120.6
Lifetime Energy Savings (24 years)*	\$55,392
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	(3.34%)
Internal Rate of Return (IRR)	(7.70%)
Net Present Value (NPV)	(\$156,577)

*Assumes 3% yearly inflation on electricity costs

**Incentives for chillers exceeding 100 tons are granted on a case by case basis, per CL&P

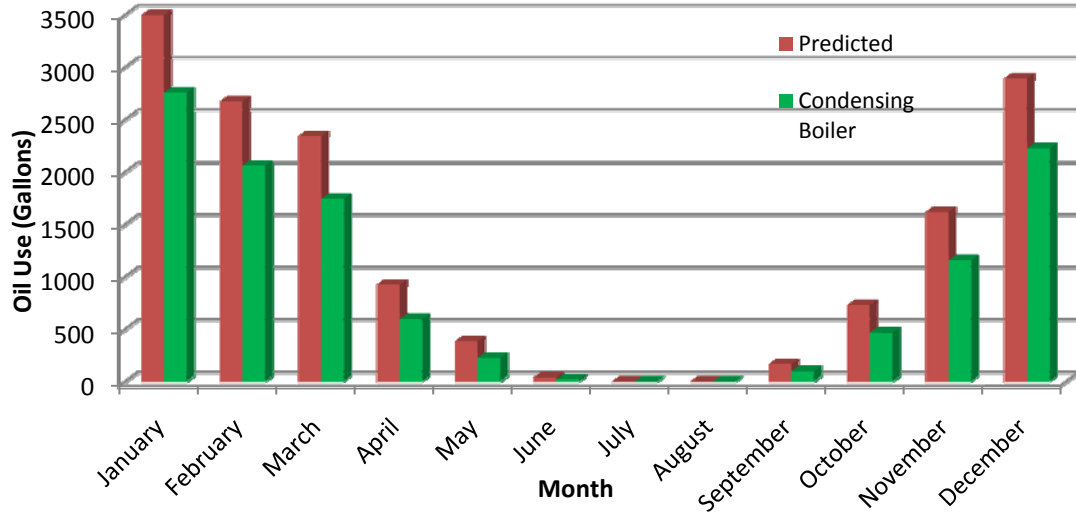
4.3.2.2 Condensing Boiler

Currently, the heating system at the Water Filtration Plant Building utilizes one (1) oil-fired Crown boiler, with an input capacity of 2,578 MBH. CDM assumes this boiler to have an overall efficiency of 80%.

CDM recommends replacing this boiler with a high-efficiency, condensing boiler. CDM anticipates that one (1) 2,000 MBH input high-efficiency condensing boiler should adequately heat the building. Ultra low sulfur fuel oil must be used for the boiler to be able to tolerate the condensate.

Figure 4.3.2.2-1 compares current oil usage with predicted oil usage resulting from a switch to a high-efficiency, condensing boiler. Condensing boilers are modeled with a full-load efficiency of 92% and return water temperature as low as 100°F in mild weather.

Figure 4.3.2.2-1: Water Filtration Plant Building – Boiler Upgrade - Oil Usage



Fiscal savings from such an upgrade are then identified in Table 4.3.2.2-1 below. Lifetime savings calculations for all ECRM's may be found in Appendix L. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing boiler replacements.

Due to the improved automation and control within modern condensing boilers, their operation and maintenance costs tend to be less than those of typical cast iron boilers. CDM estimates a cast iron boiler system of this size will typically cost around \$3,000 per year for regular preventative maintenance, whereas a condensing boiler system would cost around \$1,500 per year. Therefore, replacing the existing boiler with a condensing boiler should result in an operation and maintenance cost savings of \$1,500 per year.

Table 4.3.2.2-1: Water Filtration Plant Building Boiler Upgrade Payback	
Predicted Annual Savings (Gallons)	4,084
Total Annual Savings **	\$5,255
Initial Capital Cost of Upgrade	\$107,370
Incentives	\$0
Cost of Upgrade	\$107,370
Simple Payback	15.9
Lifetime Energy Savings (24 years)*	\$159,867
Annual Maintenance Cost Savings (AMCS)	\$1,500
Annual Return on Investment (AROI)	2.12%
Internal Rate of Return (IRR)	6.24%
Net Present Value (NPV)	\$50,028

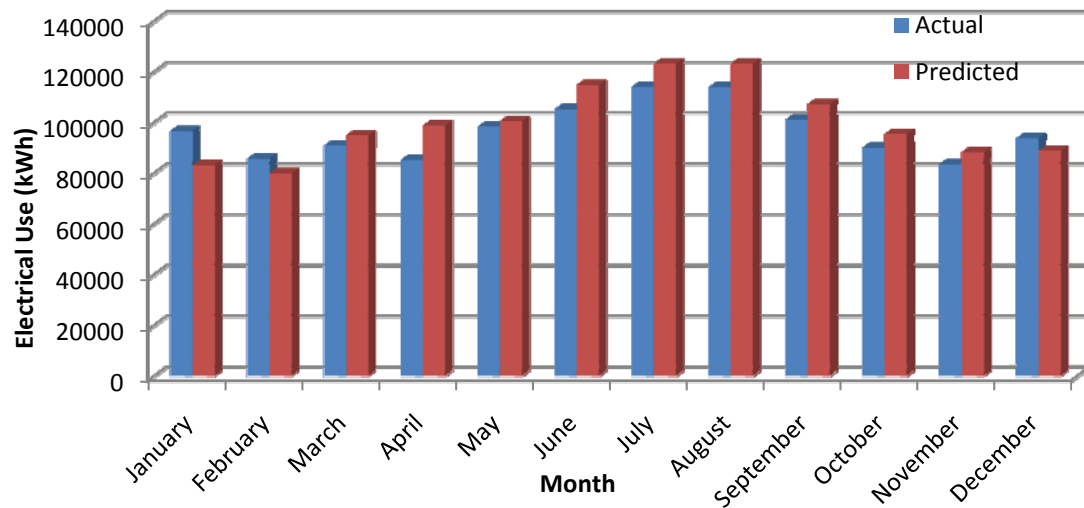
*Assumes 2% yearly inflation on oil costs

**Annual Savings is adjusted to account for oil cost increase

4.3.3 Bristol Police Department HVAC Improvements

A model of the Police Court Building was created in eQuest to predict heating and cooling loads for the building. The Parking Garage was not modeled therefore the oil usage was not calibrated to actual usage. To calibrate this model, CDM used electricity bills from March, 2009 through September, 2010. Figure 4.3.3-1 below compares actual monthly electricity usages, with those predicted by the eQuest model. Historical monthly usages were averaged for each month observed over multiple years. For example, usage during the month of June was averaged for the two years, to yield an approximate average usage during the month of June. The annual predicted electricity usage was within 4% of the actual usage.

Figure 4.3.3-1: Police Court Building Electricity Usage



4.3.3.1 NARC Office Air Handler

It is recommended that the Narcotics enforcement office have a dedicated air handler installed. The space is served by the same air handler as the neighboring spaces. The hours of operation do not match and therefore the air handler conditions unoccupied spaces. The new air handler shall be constant volume, use existing building services for heating and chilled water, and provide ventilation. The unit shall also have an economizer to allow for cooling with outdoor air.

The estimated installed cost, projected energy and cost savings, and simple payback are included in Table 4.3.1.3-1. The supporting calculations are included in Appendix E.

Table 4.3.1.3-1: NARC Office Air Handler Payback	
Predicted Annual Savings (Gallons)	701
Annual Savings (Oil)	\$1,239
Predicted Annual Savings (kWh)	27,000
Annual Savings (Electricity)	\$4,212

Table 4.3.1.3-1: NARC Office Air Handler Payback	
Total Annual Savings	\$5,451
Initial Capital Cost of Upgrade	\$15,041
Incentives	\$0
Cost of Upgrade	\$15,041
Simple Payback	2.8
Lifetime Energy Savings (20 years)*	\$135,633
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	31.24%
Internal Rate of Return (IRR)	39.15%
Net Present Value (NPV)	\$90,804

*Assumes 3% yearly inflation costs

4.3.4 Parks and Recreation HVAC Improvements

A model of the Rockwell Park Building was created in eQuest to predict heating and cooling loads for the building. To calibrate this model, CDM used electricity bills from March, 2009 through September, 2010, and oil from January 2007 to May 2010. Figure 4.3.4-1 below compares actual monthly electricity usages, with those predicted by the eQuest model. Historical monthly usages were averaged for each month observed over multiple years. For example, usage during the month of June was averaged for the two years, to yield an approximate average usage during the month of June. The annual predicted electricity usage was within 1% of the actual usage.

Figure 4.3.4-1: Rockwell Park Building Electricity Usage

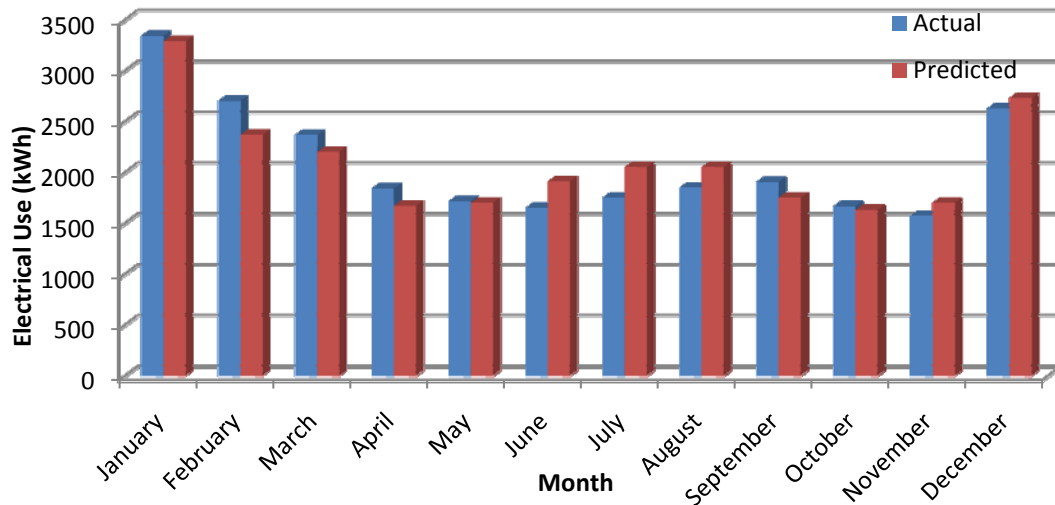
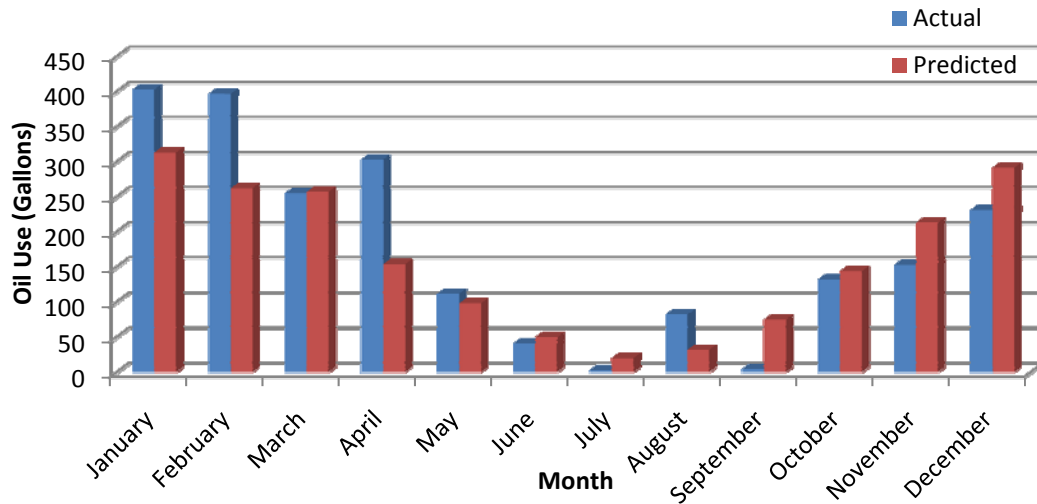


Figure 4.3.4-2 below compares actual oil usage to model-predicted oil use. The annual predicted oil usage was modeled within 10% of the actual usage.

Figure 4.3.4-2: Rockwell Park Building Oil Usage



4.3.4.1 Recreation Building Condensing Unit Heater

It is recommended that the recreation building remove their natural gas unit heaters and install a condensing natural gas unit heater. The existing heater is estimated to have an efficiency of 75%. The new unit heaters shall be electric start, natural gas fired and condensing. The unit shall be sized to properly heat the existing building. The estimated savings were generated from the condensing furnace having an efficiency of 93%.

Fiscal savings from such an upgrade are then identified in Table 4.3.4.1-1 below. Lifetime savings calculations for all ECRM's may be found in Appendix L. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing furnace replacements.

Table 4.3.4.1-1: Recreation Building Unit Heater Upgrade Payback	
Predicted Annual Savings (Therms)	205
Total Annual Savings	\$605
Initial Capital Cost of Upgrade	\$8,418
Incentives	\$0
Cost of Upgrade	\$8,418
Simple Payback	13.9
Lifetime Energy Savings (18 years)*	\$12,954
Annual Maintenance Cost Savings (AMCS)	\$0

Table 4.3.4.1-1: Recreation Building Unit Heater Upgrade Payback	
Annual Return on Investment (AROI)	1.63%
Internal Rate of Return (IRR)	5.59%
Net Present Value (NPV)	\$2,151

*Assumes 2% yearly inflation on natural gas costs

4.3.4.2 Muzzy Field Generator.

The site pays a demand charge based upon the highest rate of electric usage. For this site, the highest demand is when the field lighting is all being used. It is recommended that the site install a generator to power the field lighting. The unit shall be sized to power the field pole lighting.

Fiscal savings from such an upgrade are then identified in Table 4.3.4.2-1 below. Lifetime savings calculations for all ECRM's may be found in Appendix L. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing furnace replacements.

Table 4.3.4.2-1: Muzzy Field Generator Payback	
Total Annual Savings	\$12,425
Initial Capital Cost of Upgrade	\$160,106
Incentives	\$0
Cost of Upgrade	\$160,106
Simple Payback	12.9
Lifetime Energy Savings (20 years)*	\$333,864
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	2.76%
Internal Rate of Return (IRR)	7.40%
Net Present Value (NPV)	\$81,156

*Assumes 3% yearly inflation on electric costs

4.3.5 Bristol Fire Department HVAC Improvements

Models of the five Fire Department Buildings were created in eQuest to predict heating and cooling loads for the building. To calibrate the models, CDM used electricity bills from March, 2009 through September, 2010, oil from January 2007 to May 2010, and gas from July 2008 to August 2010. Figure 4.3.5-1 below compares actual monthly electricity usages, with those predicted by the eQuest model. Historical monthly usages were averaged for each month observed over multiple years. For example, usage during the month of June was averaged for the two years, to yield an approximate average usage during the month of June. The annual predicted electricity usage for the headquarters was within 1% of the actual usage.

Figure 4.3.5-1: Fire Headquarters Building Electricity Usage

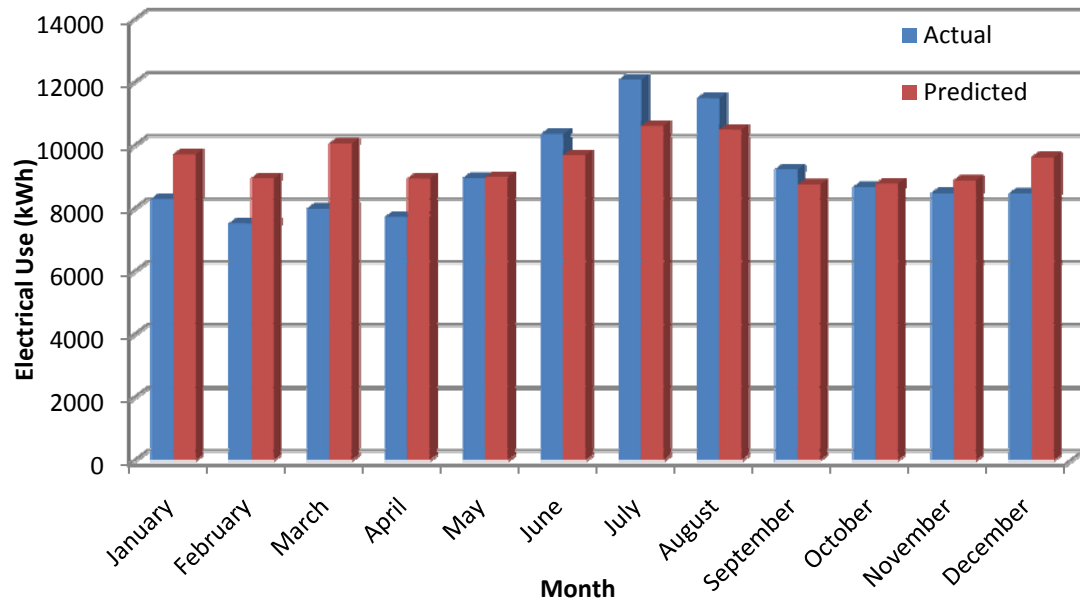
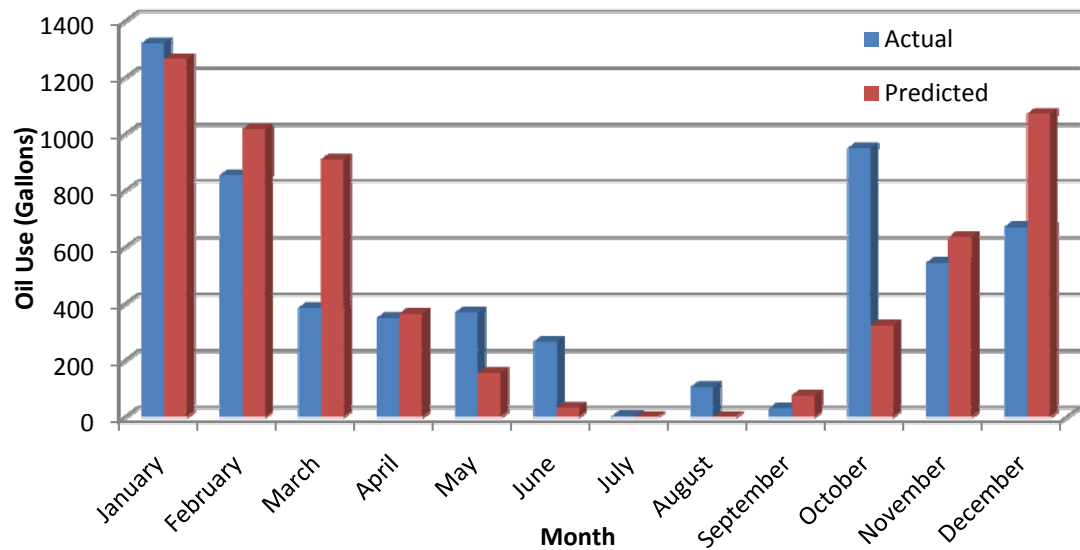


Figure 4.3.5-2 below compares actual oil usage to model-predicted oil use. The annual predicted oil usage was modeled within 1% of the actual usage.

Figure 4.3.5-2: Fire Headquarters Building Oil Usage



The annual predicted electricity usage for Engine 2 was within 3% of the actual usage.

Figure 4.3.5-3: Engine 2 Building Electricity Usage

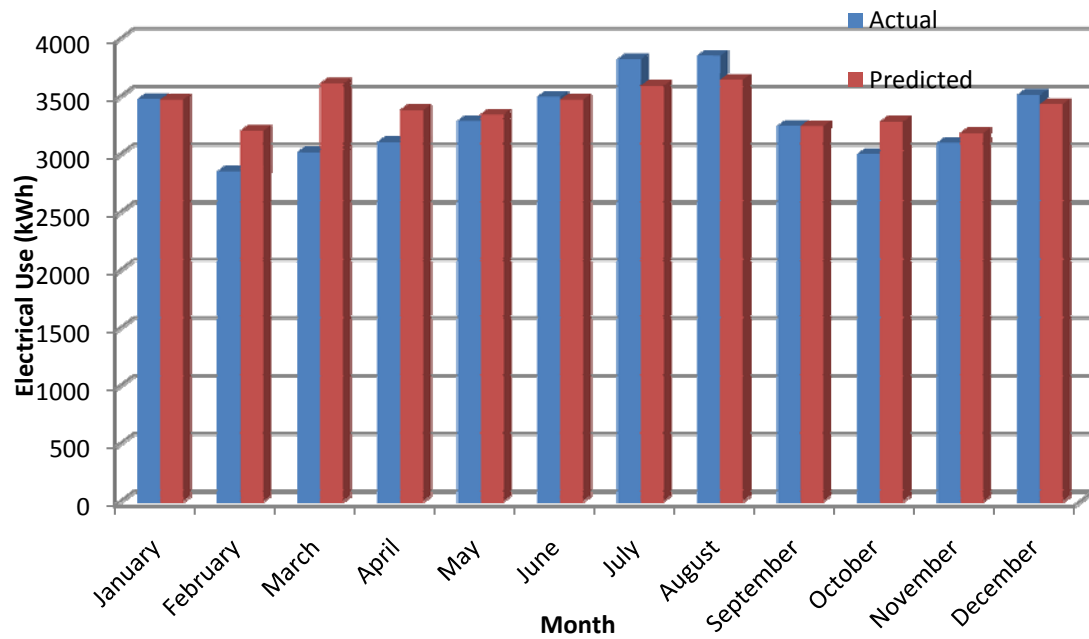
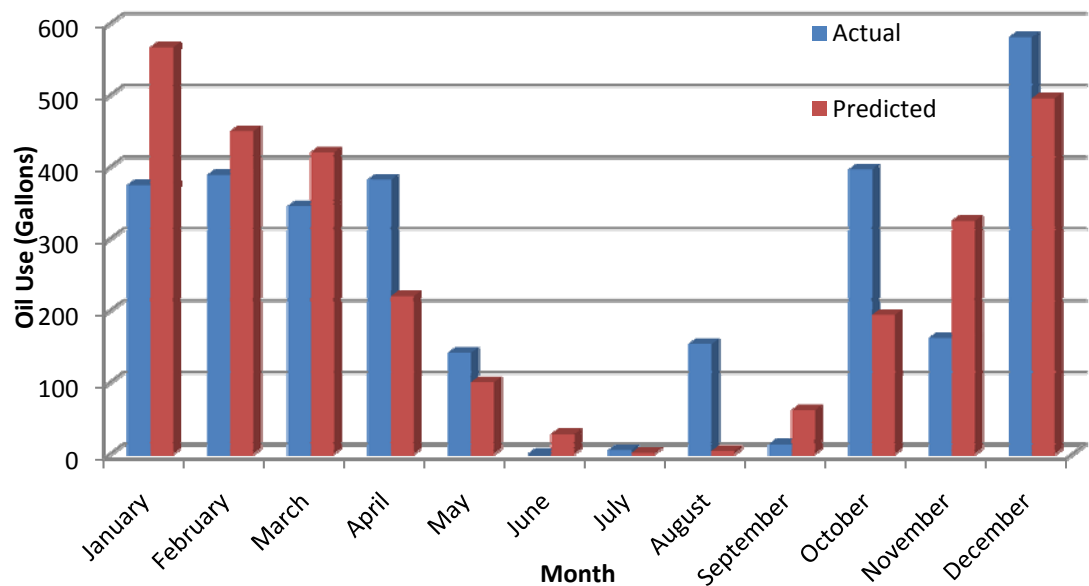


Figure 4.3.5-4 below compares actual oil usage to model-predicted oil use. The annual predicted oil usage was modeled within 3% of the actual usage.

Figure 4.3.5-4: Engine 2 Building Oil Usage



The annual predicted electricity usage for Engine 3 was within 4% of the actual usage.

Figure 4.3.5-5: Engine 3 Building Electricity Usage

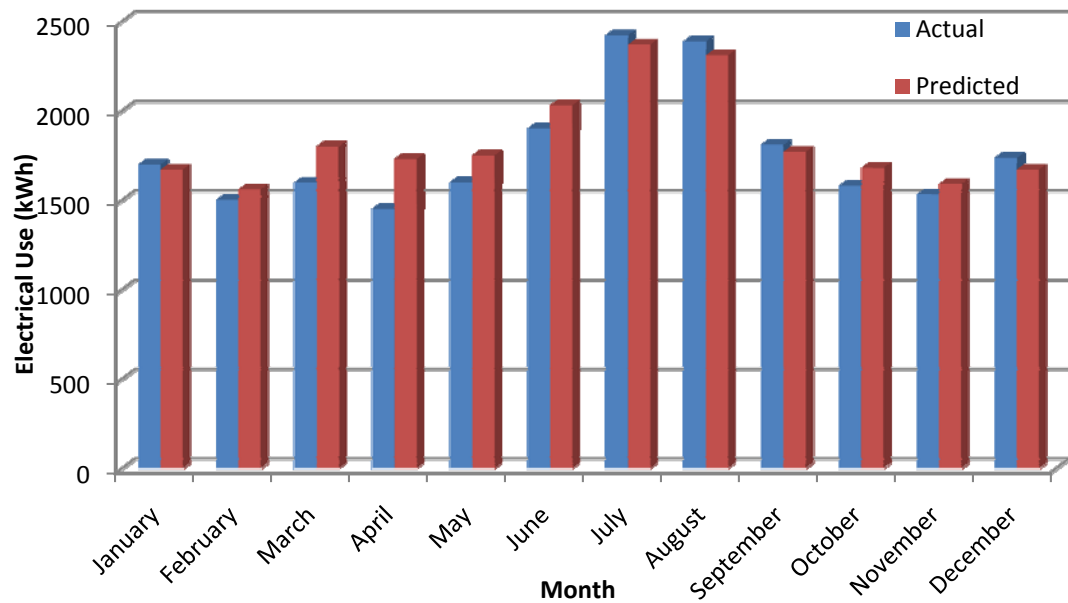
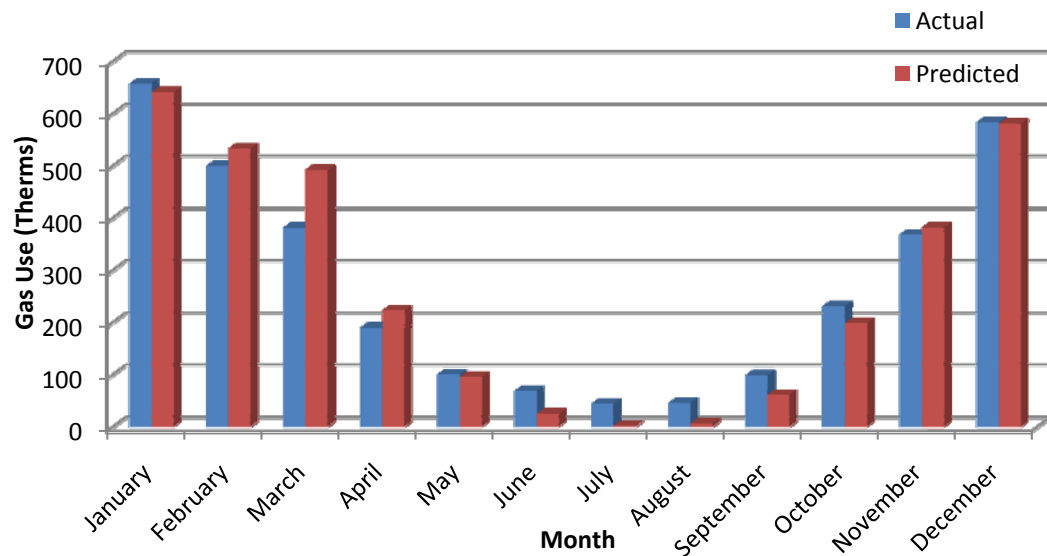


Figure 4.3.5-6 below compares actual natural gas usage to model-predicted gas use. The annual predicted gas usage was modeled within 1% of the actual usage.

Figure 4.3.5-6: Engine 3 Building Gas Usage



The annual predicted electricity usage for Engine 4 was within 9% of the actual usage.

Figure 4.3.5-7: Engine 4 Building Electricity Usage

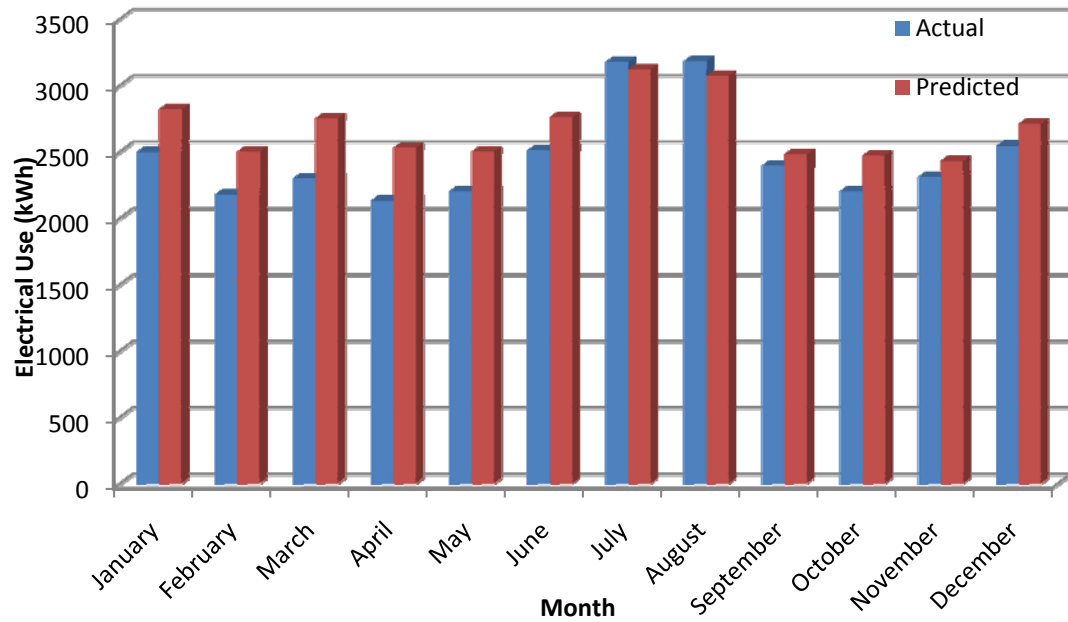
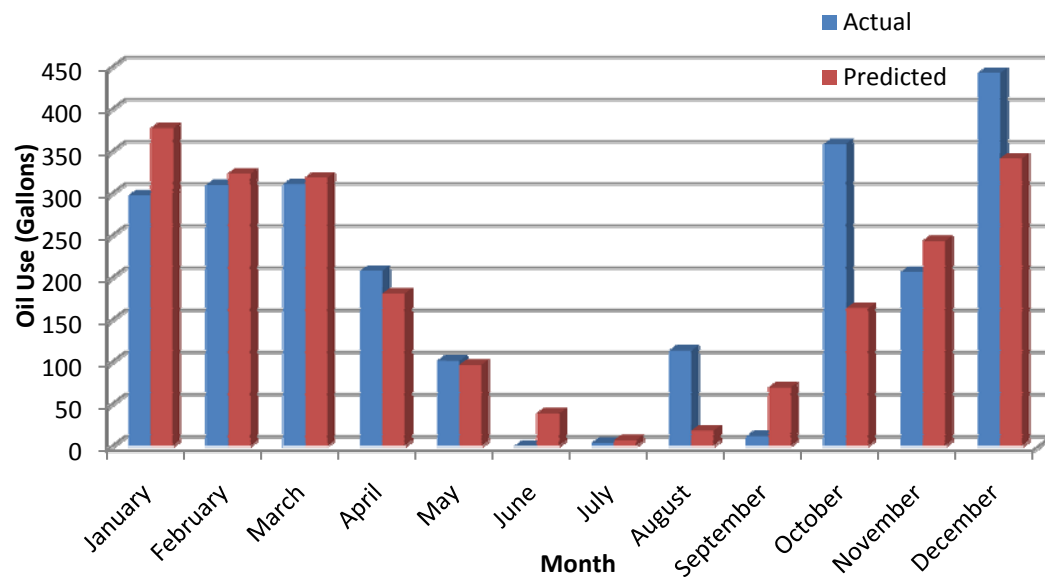


Figure 4.3.5-8 below compares actual oil usage to model-predicted oil use. The annual predicted oil usage was modeled within 8% of the actual usage.

Figure 4.3.5-8: Engine 4 Building Oil Usage



The annual predicted electricity usage for Engine 5 was within 1% of the actual usage.

Figure 4.3.5-9: Engine 5 Building Electricity Usage

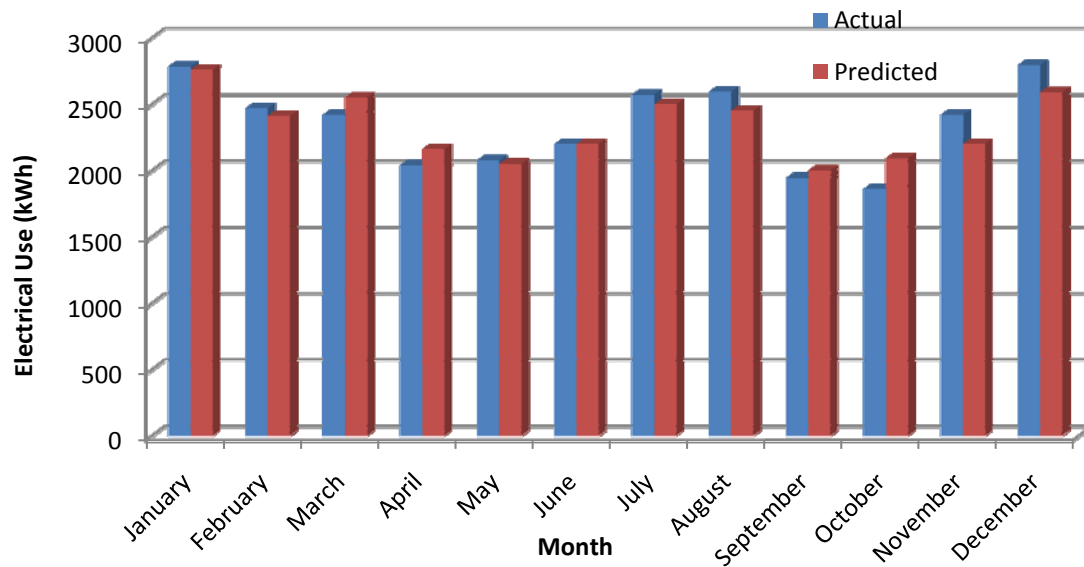
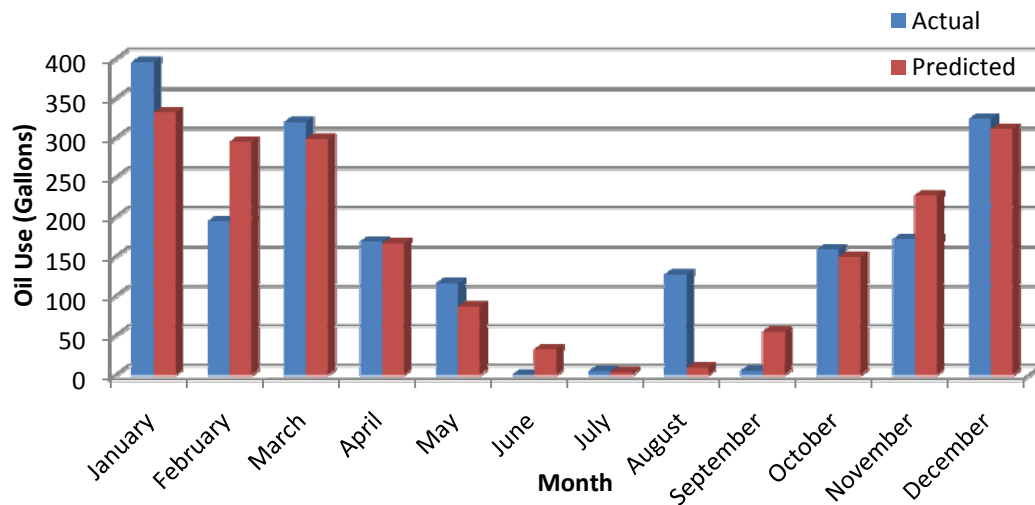


Figure 4.3.5-10 below compares actual oil usage to model-predicted oil use. The annual predicted oil usage was modeled within 1% of the actual usage.

Figure 4.3.5-10: Engine 5 Building Oil Usage



4.3.5.1 DDC Controls

It is recommended that every fire house have a boiler controller installed on their heating boiler. The controller shall be capable of adjusting supply water temperature based upon outdoor air temperature and outdoor temperature cut off. The unit shall be Heat-Timer HWR or equal. Unit shall have DHW priority capability, adjustable reset ratio and limits. Controls must measure heating system temperature and outdoor temperature. Heating Boiler Controller shall also be BACnet compatible. The controller will then be connected with a BACnet device that will make the building

information available over the internet. This will allow the building to connect to the city wide control system for monitoring.

Savings from such an implementation are shown in Table 4.3.5.1-1. Savings are estimated to be 10% of the energy of the systems controlled. The heating system will be controllable by the DDC.

Table 4.3.5.1-1: Fire House DDC Controls Payback	
Estimated Annual Heating Usage (Therms)	3,240
Predicted Annual Savings (Therms)	324
Annual Savings (Gas)	\$593
Estimate Annual Heating Usage (gallons)	12,860
Predicted Annual Savings (gallons)	1,286
Annual Savings (oil)	\$2,106
Total Annual Savings	\$2,699
Initial Capital Cost of Upgrade	\$93,567
Incentives	\$0
Cost of Upgrade	\$93,567
Simple Payback	34.7
Lifetime Energy Savings (15 years)*	\$46,675
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	(2.67%)
Internal Rate of Return (IRR)	(-6.57%)
Net Present Value (NPV)	(\$54,261)

*Assumes 2% yearly inflation on natural gas

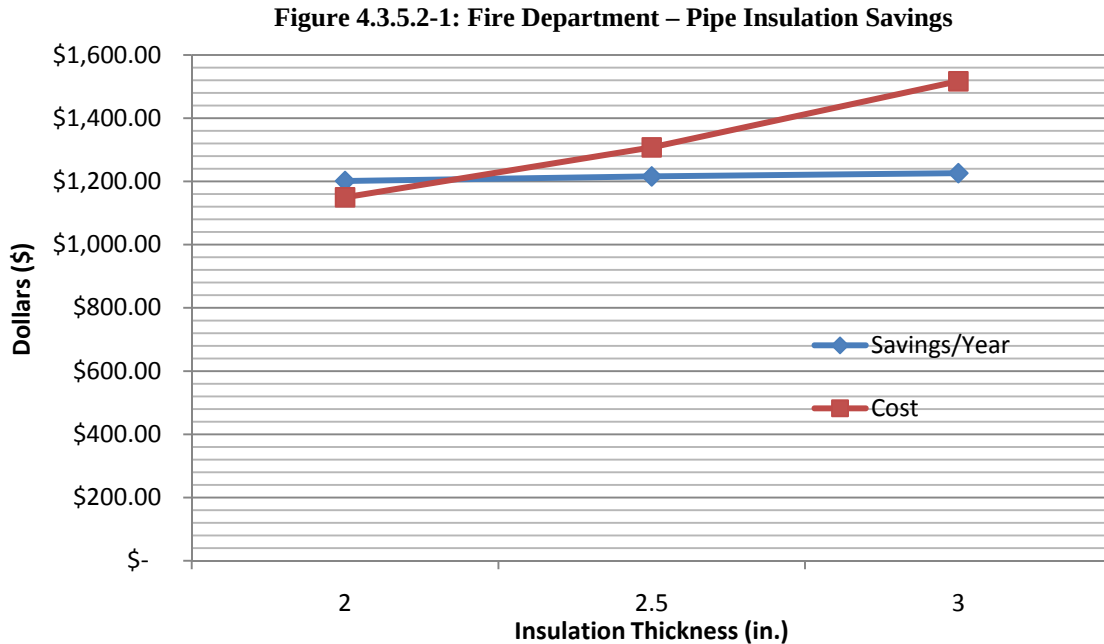
**No incentives were found for this ECRM

4.3.5.2 Pipe Insulation

It is recommended that every fire house insulate the heating hot water and domestic hot water piping located in the mechanical room.

3E Plus is an insulation thickness computer program and was used to estimate the savings. The four fire houses that run their boilers on oil were done in one model. The boiler at Firehouse 3 is gas fired and was modeled separately to get energy savings in therms. The water temperature for all sites is assumed to be maintained at 180 degrees F, and the ambient temperature surrounding the piping is assumed to be at an average of 80 degrees F throughout the winter. The existing pipe diameter of 3" was used for the four fire houses and 2" for Firehouse 3. 4,500 run time hours were used for the two calculations and pipe run lengths of 20' at each site. Fiberglass insulation with an all service jacket was the material input.

Connecticut energy code requires hot water pipe insulation thickness for 1.5" pipe or greater to be at least 2" thick. CDM evaluated insulation thicknesses between 2" to 3" to find the shortest payback. Figure 4.3.5.2-1 shows the savings and cost associated with each insulation thickness.



Fiscal savings from the 2" insulation addition to the piping are then identified in Table 4.3.5.2-1 below. Lifetime savings calculations for all ECRM's may be found in Appendix L. It's important to note that these are estimates based on building models and simulation software. Further investigation of insulation material, thickness and savings is warranted before pursuing installation.

Table 4.3.5.2-1: Fire Department Pipe Insulation Payback	
Predicted Annual Savings (Gallons Oil; Therms Gas)	569; 107
Total Annual Savings	\$1,201
Initial Capital Cost of Upgrade	\$1,150
Incentives**	\$0
Cost of Upgrade	\$1,150
Simple Payback	1.0
Lifetime Energy Savings (24 years)*	\$36,537
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	100.27%
Internal Rate of Return (IRR)	107.43%
Net Present Value (NPV)	\$26,834

*Assumes 2% yearly inflation on natural gas/oil costs

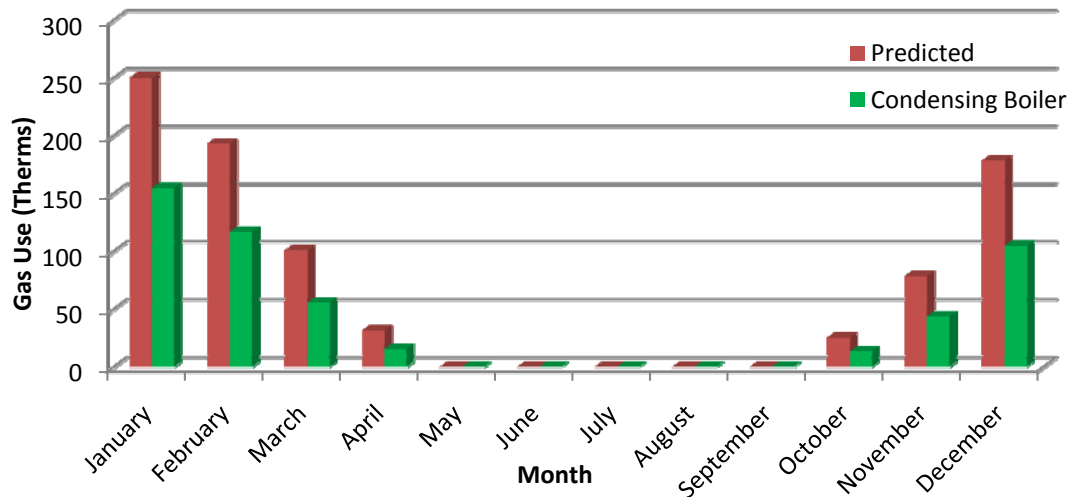
4.3.5.3 Condensing Boiler

Currently, the heating system at the Fire Headquarters utilizes one (1) oil-fired AO Smith cast iron boiler, with an output capacity of 1,137 MBH. CDM assumes this boiler to have an overall efficiency of 81%.

CDM recommends replacing this boiler with a high-efficiency, condensing boiler. CDM anticipates that one (1) 2,000 MBH input high-efficiency condensing boiler should adequately heat the building. Ultra low sulfur fuel oil must be used for the boiler to be able to tolerate the condensate.

Figure 4.3.5.3-1 compares current oil usage with predicted oil usage resulting from a switch to a high-efficiency, condensing boiler. Condensing boilers are modeled with a full-load efficiency of 92% and return water temperature as low as 100°F in mild weather.

Figure 4.3.5.3-1: Fire Headquarters Building – Boiler Upgrade - Oil Usage



Fiscal savings from such an upgrade are then identified in Table 4.2.3-1 below. Lifetime savings calculations for all ECRM's may be found in Appendix L. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing boiler replacements.

Due to the improved automation and control within modern condensing boilers, their operation and maintenance costs tend to be less than those of typical cast iron boilers. CDM estimates a cast iron boiler system of this size will typically cost around \$3,000 per year for regular preventative maintenance, whereas a condensing boiler system would cost around \$1,500 per year. Therefore, replacing the existing boiler with a condensing boiler should result in an operation and maintenance cost savings of \$1,500 per year.

Table 4.3.5.3-1: Fire Headquarters Building Boiler Upgrade Payback	
Predicted Annual Savings (Gallons)	1,557
Total Annual Savings **	\$2,004
Initial Capital Cost of Upgrade	\$107,370
Incentives	\$0
Cost of Upgrade	\$107,370
Simple Payback	30.6
Lifetime Energy Savings (24 years)*	\$60,965
Annual Maintenance Cost Savings (AMCS)	\$1,500
Annual Return on Investment (AROI)	(0.90%)
Internal Rate of Return (IRR)	0.85%
Net Present Value (NPV)	(\$25,723)

*Assumes 2% yearly inflation on natural gas costs

**Annual Savings is adjusted to account for oil cost increase

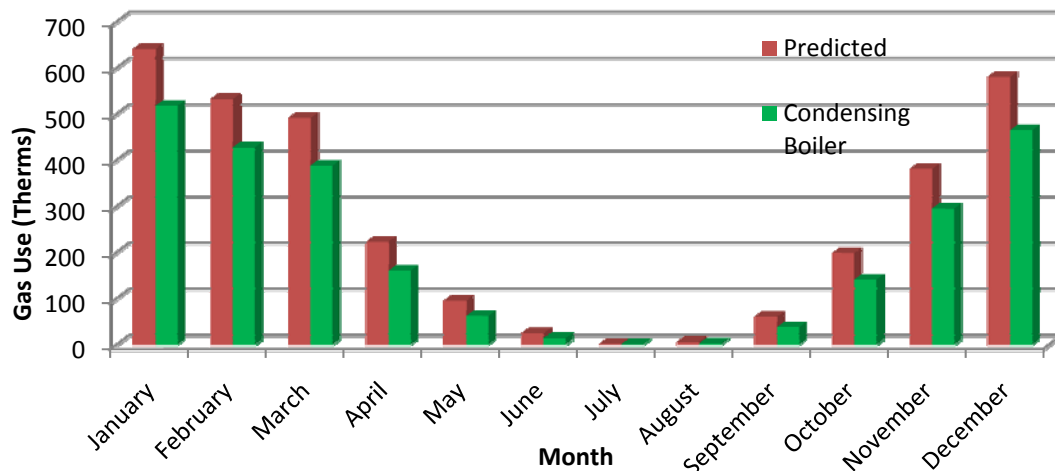
Currently, the heating system utilizes one (1) gas-fired Weil McLain cast iron boiler, with an input rating of 200 MBH. A hot water gross I=B=R rating of 160 MBH gives this boiler an overall efficiency of 80%.

CDM recommends replacing this boiler with a high-efficiency, condensing boiler.

CDM anticipates that one (1) 450 MBH input high-efficiency condensing boiler should adequately heat the building.

Figure 4.2.3-2 compares current gas usage with predicted gas usage resulting from a switch to a high-efficiency, condensing boiler. Condensing boilers are modeled with a full-load efficiency of 92% and return water temperature as low as 100°F in mild weather.

Figure 4.3.5.3-2: Engine 3 – Boiler Upgrade - Natural Gas Usage



Fiscal savings from such an upgrade are then identified in Table 4.2.3-2 below. Lifetime savings calculations for all ECRM's may be found in Appendix L. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing boiler replacements.

Due to the improved automation and control within modern condensing boilers, their operation and maintenance costs tend to be less than those of typical cast iron boilers. CDM estimates a cast iron boiler system of this size will typically cost around \$1,750 per year for regular preventative maintenance, whereas a condensing boiler system would cost around \$1,000 per year. Therefore, replacing the existing boiler with a condensing boiler should result in an operation and maintenance cost savings of \$750 per year.

Table 4.3.5.3-2: Engine 3 Boiler Upgrade Payback	
Predicted Annual Savings (Therms)	725
Total Annual Savings	\$1,329
Initial Capital Cost of Upgrade	\$45,846
Incentives	\$0
Cost of Upgrade	\$45,846
Simple Payback	22.1
Lifetime Energy Savings (24 years)*	\$40,431
Annual Maintenance Cost Savings (AMCS)	\$750
Annual Return on Investment (AROI)	0.37%
Internal Rate of Return (IRR)	3.46%
Net Present Value (NPV)	\$2,597

*Assumes 2% yearly inflation on natural gas costs

4.3.6 Senior Center HVAC Improvements

A model of the Senior Center Building was created in eQuest to predict heating and cooling loads for the building. To calibrate the models, CDM used electricity bills from March, 2009 through September, 2010, and gas from July 2008 to August 2010. Figure 4.3.6-1 below compares actual monthly electricity usages, with those predicted by the eQuest model. Historical monthly usages were averaged for each month observed over multiple years. For example, usage during the month of June was averaged for the two years, to yield an approximate average usage during the month of June. The annual predicted electricity usage was within 3% of the actual usage.

Figure 4.3.6-1: Senior Center Building Electricity Usage

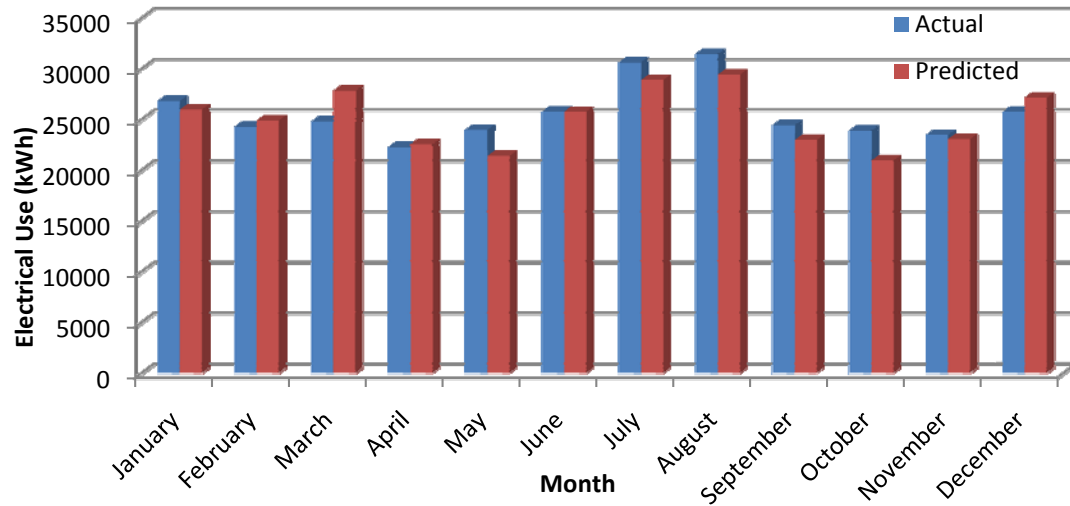
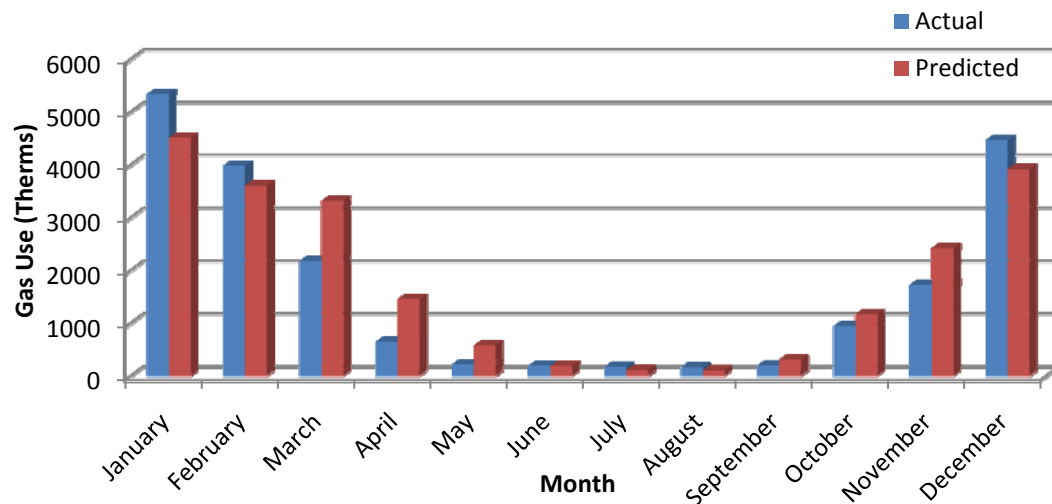


Figure 4.3.6-2 below compares actual natural gas usage to model-predicted gas use. The annual predicted gas usage was modeled within 8% of the actual usage.

Figure 4.3.6-2: Senior Center Building Gas Usage



4.3.6.1 Senior Center DDC Controls

It is recommended that the existing controls be replaced with electronic DDC. This will require changing from local thermostats to ones controlled by a central DDC controller. The controller will record and control the space temperatures, air conditioning systems, boiler and zone pumps.

Currently, HVAC systems at the Senior Center are controlled by a local thermostats. Consolidating control of these units into one central building management system (BMS) with direct digital controls (DDC) may provide significant energy savings. A consolidated DDC building management system typically tends to offer a 10% energy savings over independent unit controls.

A centralized building management system can incorporate real time energy monitoring for all HVAC systems, allowing the city to see exactly how much energy is being used to heat and/or cool the building at any time throughout the year. It can also incorporate staging air conditioning and heating units to reduce the building peak electrical and gas demand. The building management system shall be capable of relaying information to the city control system located at City Hall for monitoring.

CDM was not able to locate any available grants or incentives for consolidating systems and switching to DDC. Despite this, however, this change still offers an attractive payback and is therefore recommended by CDM.

The estimated installed cost, projected energy and cost savings, and simple payback are included in Table 4.3.1.3-1. The model output is included in Appendix F. Electricity savings are estimated to be 10% of the total ventilation, pump, heating and cooling usage. The energy usages and savings are presented below.

Table 4.3.6.1-1: Senior Center DDC BMS Payback	
Estimate Annual Heating Usage (Therms)	20,210
Predicted Annual Savings (Therms)	2,021
Annual Savings (Gas)	\$3,517
Estimated Annual HVAC Usage (kWh)	121,210
Predicted Annual Savings (kWh)	12,121
Annual Savings (Electricity)	\$2,350
Total Annual Savings	\$5,867
Initial Capital Cost of Upgrade	\$68,251
Incentives	\$0
Cost of Upgrade	\$68,251
Simple Payback	11.6
Lifetime Energy Savings (15 years)*	\$101,460
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	1.93
Internal Rate of Return (IRR)	6.04%
Net Present Value (NPV)	\$17,197

*Assumes 3% yearly inflation on electric costs; 2% on gas & oil costs

**No incentives were found for this ECRM

4.3.6.2 Condensing Boiler

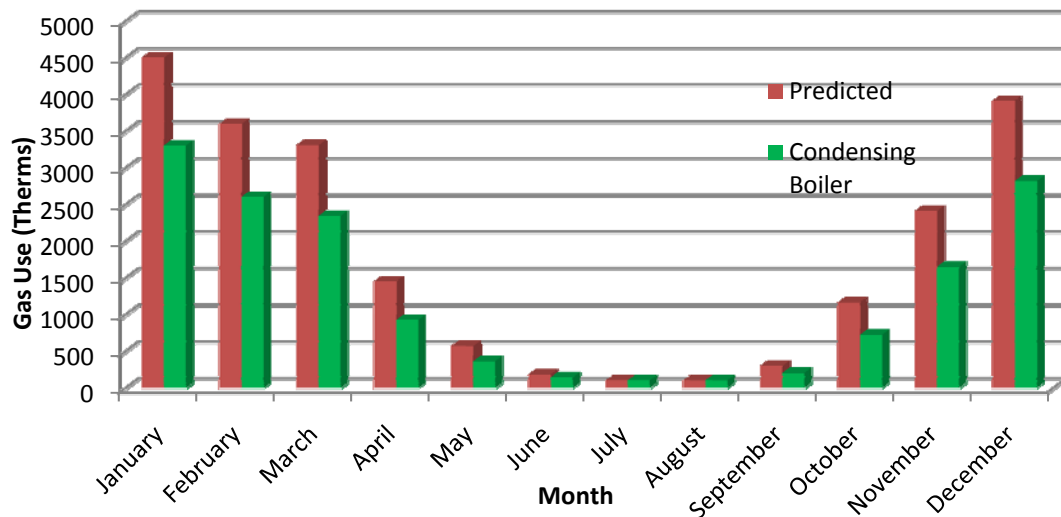
Currently, the heating system utilizes one (1) gas-fired Weil McLain cast iron boiler, with an input rating of 3,753 MBH. A hot water gross I=B=R rating of 3,000 MBH gives this boiler an overall efficiency of 80%.

CDM recommends replacing this boiler with a high-efficiency, condensing boiler.

CDM anticipates that one (1) 3,000 MBH input high-efficiency condensing boiler should adequately heat the building.

Figure 4.3.6.2-1 compares current gas usage with predicted gas usage resulting from a switch to a high-efficiency, condensing boiler. Condensing boilers are modeled with a full-load efficiency of 92% and return water temperature as low as 100°F in mild weather.

Figure 4.3.6.2-1: Senior Center – Boiler Upgrade - Natural Gas Usage



Fiscal savings from such an upgrade are then identified in Table 4.3.6.2-1 below. Lifetime savings calculations for all ECRM's may be found in Appendix L. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing boiler replacements.

Due to the improved automation and control within modern condensing boilers, their operation and maintenance costs tend to be less than those of typical cast iron boilers. CDM estimates a cast iron boiler system of this size will typically cost around \$3,000 per year for regular preventative maintenance, whereas a condensing boiler system would cost around \$1,500 per year. Therefore, replacing the existing boiler with a condensing boiler should result in an operation and maintenance cost savings of \$1,500 per year.

Table 4.3.6.2-1: Senior Center Boiler Upgrade Payback	
Predicted Annual Savings (Therms)	6,332
Total Annual Savings	\$11,026
Initial Capital Cost of Upgrade	\$134,479
Incentives	\$0
Cost of Upgrade	\$134,479
Simple Payback	10.7
Lifetime Energy Savings (24 years)*	\$335,431
Annual Maintenance Cost Savings (AMCS)	\$1,500
Annual Return on Investment (AROI)	5.15%
Internal Rate of Return (IRR)	10.64%
Net Present Value (NPV)	\$157,389

*Assumes 2% yearly inflation on natural gas costs

4.3.7 Library HVAC Improvements

Models of the two Libraries were created in eQuest to predict heating and cooling loads for the building. To calibrate the models, CDM used electricity bills from March, 2009 through September, 2010, and gas from July 2008 to August 2010. Figure 4.3.7-1 below compares actual monthly electricity usages, with those predicted by the eQuest model. Historical monthly usages were averaged for each month observed over multiple years. For example, usage during the month of June was averaged for the two years, to yield an approximate average usage during the month of June. The annual predicted electricity usage was within 4% of the actual usage.

Figure 4.3.7-1: Main Library Electricity Usage

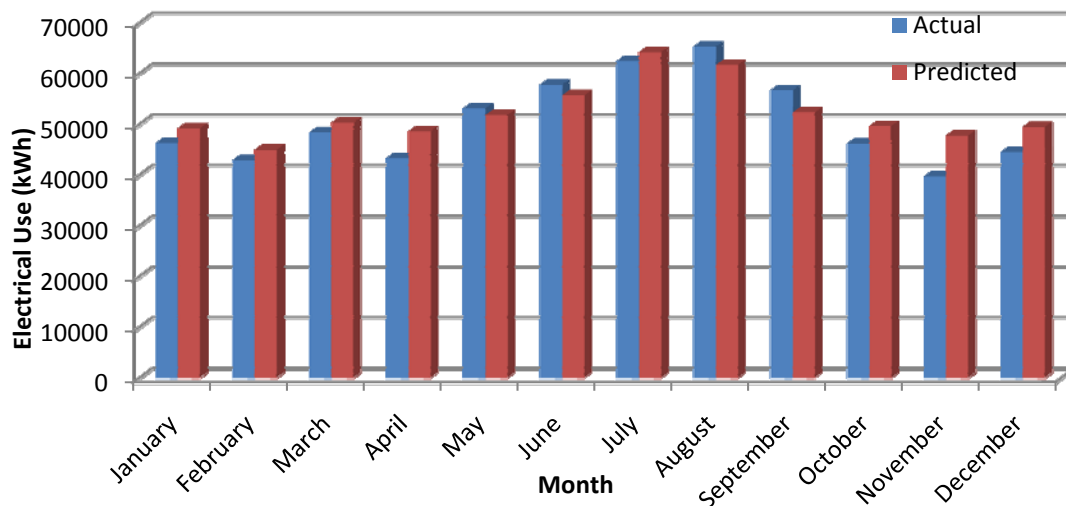
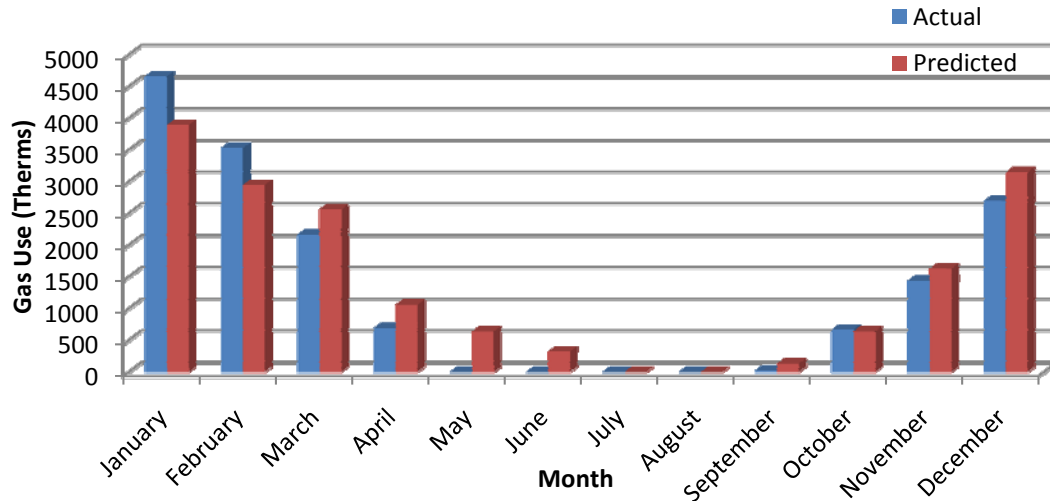


Figure 4.3.7-2 below compares actual natural gas usage to model-predicted gas use. The annual predicted gas usage was modeled within 7% of the actual usage.

Figure 4.3.7-2: Main Library Gas Usage



The annual predicted electricity usage for the public library was within 5% of the actual usage.

Figure 4.3.7-3: Public Library Electricity Usage

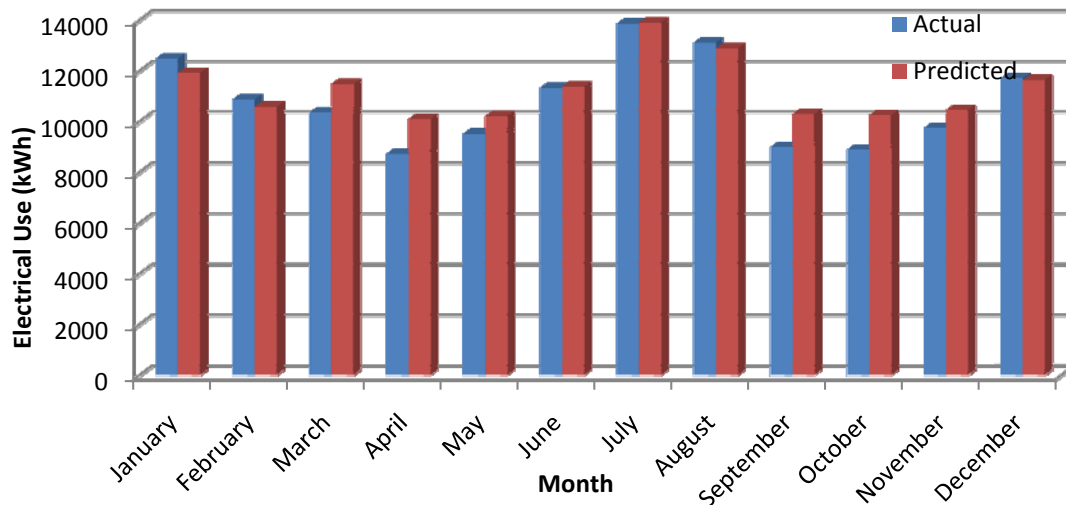
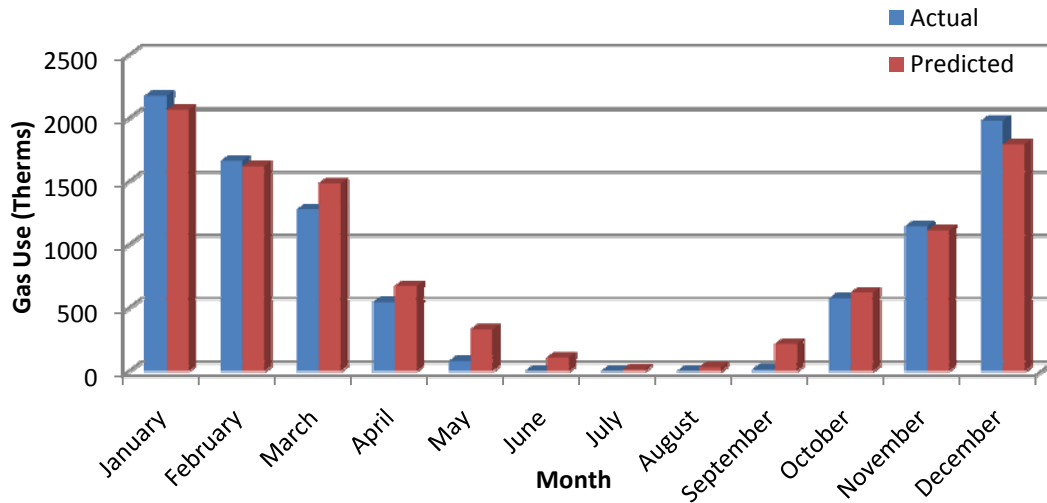


Figure 4.3.7-4 below compares actual natural gas usage to model-predicted gas use. The annual predicted gas usage was modeled within 7% of the actual usage.

Figure 4.3.7-4: Public Library Gas Usage

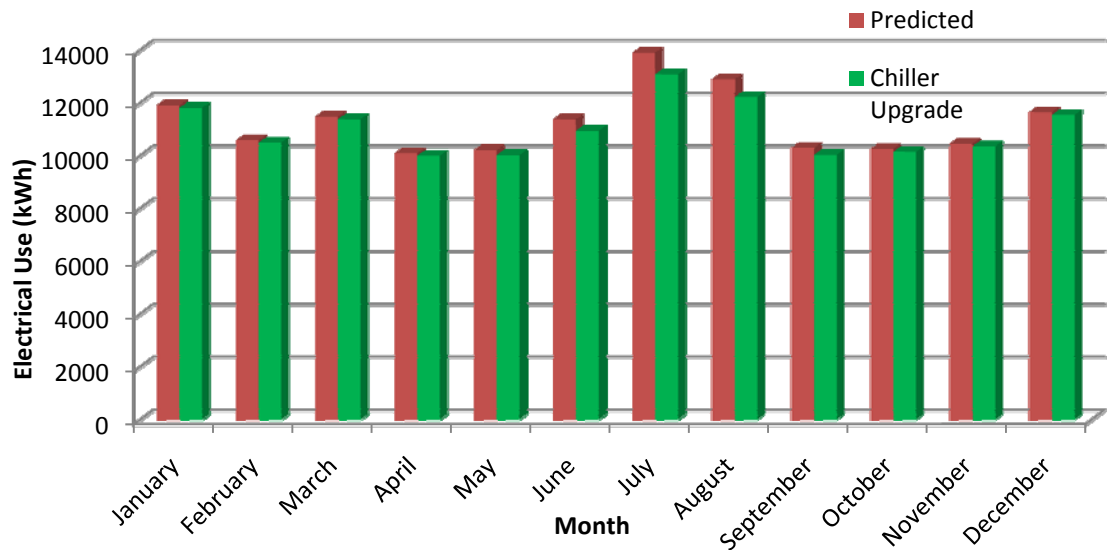


4.3.7.1 Chiller replacement

It is recommended that the existing central chiller be replaced with a high efficiency unit. This new unit shall be a scroll compressor chiller. The new unit shall be air cooled. The new unit shall have a COP of approximately 3.2. The replacement chiller was sized at approximately 30 tons.

CDM modeled the existing chiller with a COP of 2.7. Figure 4.3.7.1-1 demonstrates the anticipated monthly electricity usage realized from an upgrade to a high efficiency chiller.

Figure 4.3.7.1-1: Public Library – Chiller Upgrade - Electricity Usage



Resulting anticipated savings and payback are shown in Table 4.3.7.1-1.

Table 4.3.7.1-1: Public Library Chiller Upgrade Payback	
Predicted Annual Savings (kWh)	3,080
Total Annual Savings	\$483
Initial Capital Cost of Upgrade	\$69,846
Incentives	\$0
Cost of Upgrade	\$69,846
Simple Payback	144.6
Lifetime Energy Savings (24 years)*	\$16,628
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	(5.98%)
Internal Rate of Return (IRR)	(8.66%)
Net Present Value (NPV)	(\$62,812)

*Assumes 3% yearly inflation on electricity costs

4.3.7.2 Condensing Boiler

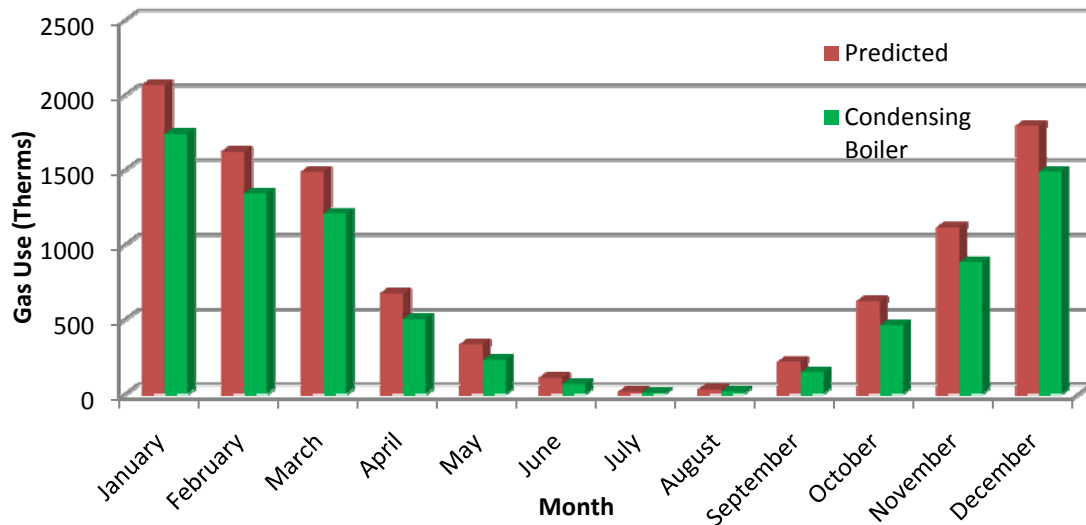
Currently, the heating system utilizes one (1) gas-fired Weil McLain boiler, with a heating capacity of 450 MBH. CDM estimates this boiler to have an overall efficiency of 80%.

CDM recommends replacing this boiler with a high-efficiency, condensing boiler.

CDM anticipates that one (1) 450 MBH input high-efficiency condensing boiler should adequately heat the building.

Figure 4.3.7.2-1 compares current gas usage with predicted gas usage resulting from a switch to a high-efficiency, condensing boiler. Condensing boilers are modeled with a full-load efficiency of 92% and return water temperature as low as 100°F in mild weather.

Figure 4.3.7.2-1: Public Library – Boiler Upgrade - Natural Gas Usage



Fiscal savings from such an upgrade are then identified in Table 4.3.7.2-1 below. Lifetime savings calculations for all ECRM's may be found in Appendix L. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing boiler replacements.

Due to the improved automation and control within modern condensing boilers, their operation and maintenance costs tend to be less than those of typical cast iron boilers. CDM estimates a cast iron boiler system of this size will typically cost around \$1,500 per year for regular preventative maintenance, whereas a condensing boiler system would cost around \$750 per year. Therefore, replacing the existing boiler with a condensing boiler should result in an operation and maintenance cost savings of \$750 per year.

Table 4.3.7.2-1: Public Library Boiler Upgrade Payback	
Predicted Annual Savings (Therms)	1,995
Total Annual Savings	\$3,737
Initial Capital Cost of Upgrade	\$70,347
Incentives	\$0
Cost of Upgrade	\$70,347
Simple Payback	15.7
Lifetime Energy Savings (24 years)*	\$113,687
Annual Maintenance Cost Savings (AMCS)	\$750
Annual Return on Investment (AROI)	2.21%
Internal Rate of Return (IRR)	6.55%
Net Present Value (NPV)	\$34,204

*Assumes 2% yearly inflation on natural gas costs

4.3.8 Youth Services HVAC Improvements

A model of the Youth Services Building was created in eQuest to predict heating and cooling loads for the building. To calibrate the models, CDM used electricity bills from March, 2009 through September, 2010, and oil from January 2007 to May 2010. Figure 4.3.8-1 below compares actual monthly electricity usages, with those predicted by the eQuest model. Historical monthly usages were averaged for each month observed over multiple years. For example, usage during the month of June was averaged for the two years, to yield an approximate average usage during the month of June. The annual predicted electricity usage was within 1% of the actual usage.

Figure 4.3.8-1: Youth Services Building Electricity Usage

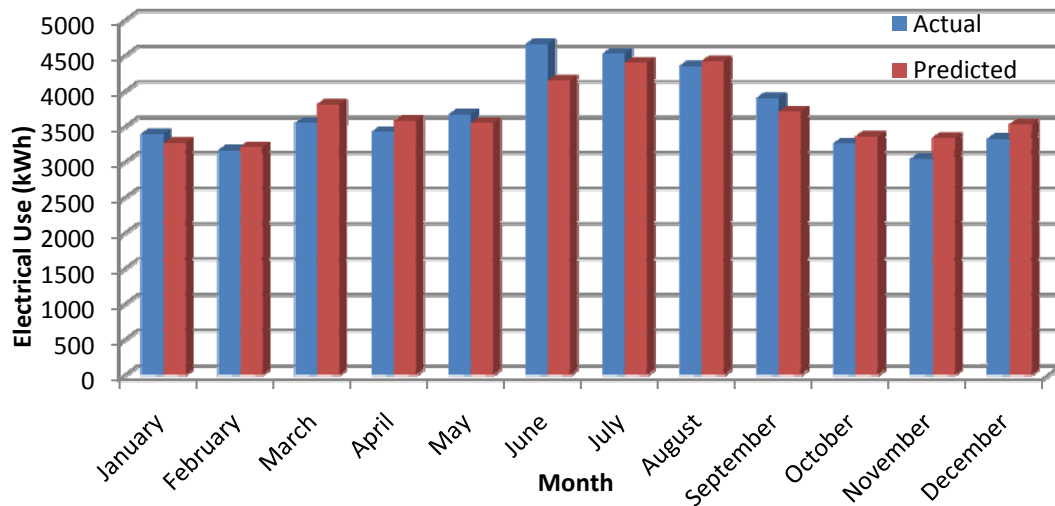
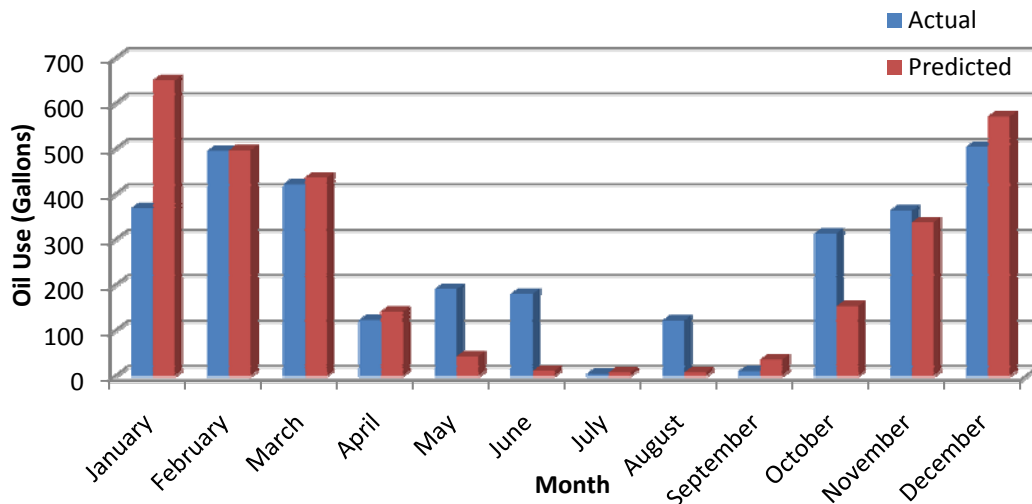


Figure 4.3.8-2 below compares actual oil usage to model-predicted oil use. The annual predicted oil usage was modeled within 7% of the actual usage.

Figure 4.3.8-2: Youth Services Building Gas Usage



4.3.8.1 DDC Controls

It is recommended that a boiler controller shall be installed on the heating boiler. The controller shall be capable of adjusting supply water temperature based upon outdoor air temperature and outdoor temperature cut off. The unit shall be Heat-Timer HWR or equal. Unit shall have DHW priority capability, adjustable reset ratio and limits. Controls must measure heating system temperature and outdoor temperature. Heating Boiler Controller shall also be BACnet compatible. The controller will then be connected with a BACnet device that will make the building information available over the internet. This will allow the building to connect to the city wide control system for monitoring.

Savings from such an implementation are shown in Table 4.3.8.1-1. Savings are estimated to be 10% of the energy of the systems controlled. The heating system will be controllable by the DDC.

Table 4.3.8.1-1: Youth Services DDC Payback	
Estimated Annual HVAC Usage (Gallons)	2,890
Predicted Annual Savings (Gallons)	289
Annual Savings (Oil)	\$511
Total Annual Savings	\$511
Initial Capital Cost of Upgrade	\$18,713
Incentives	\$0
Cost of Upgrade	\$18,713
Simple Payback	36.6
Lifetime Energy Savings (15 years)*	\$8,836
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	(3.94%)
Internal Rate of Return (IRR)	(7.09%)
Net Present Value (NPV)	(\$11,271)

*Assumes 2% yearly inflation on natural gas

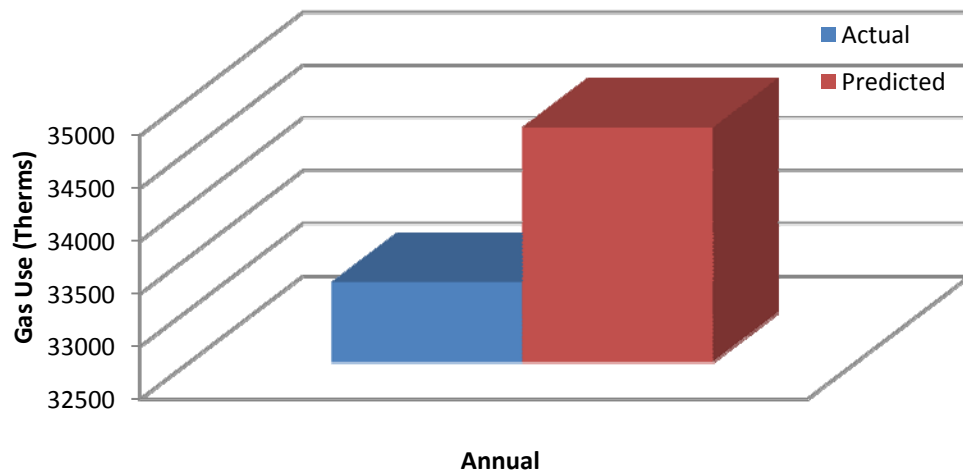
**No incentives were found for this ECRM

4.3.9 Water Pollution Control HVAC Improvements

The Water Pollution Control Plant is on one electric bill. Modeling all of the buildings and calibrating to the entire plant's electric bill would not be beneficial for estimated electrical usage or energy savings. However, there are eight buildings that have natural gas heating. The eight buildings that have gas heating are billed on one account. These buildings are the Operations Building, Headworks Building, Primary & Secondary Building, Air Blower Building, Pump House Building, Sludge Thickening & Disposal Building. The eight buildings were modeled and their predicted oil usages were combined and calibrated to the actual usage. The Headworks Building, Primary & Secondary Building, Air Blower Building, Pump

House Building, Sludge Thickening & Disposal Building were modeled with a BIN model and the predicted oil usage was added to the annual usage predicted by the eQuest model of the Administration and Operations Building. To calibrate the models, CDM used natural gas bills from August 2008 through August 2010. Figure 4.3.9-1 below compares actual annual gas usages, with those predicted by the eQUEST and BIN models for the Water Pollution Control Plant. The models combined are modeled within 5% of the actual usage.

Figure 4.3.9-1: Water Pollution Control Plant – Gas Usage



4.3.9.1 Head Works Process Water Heat Pump

A water source heat pump extracts heat out of the water to heat the space. A waste water heat pump extracts the heat from process water to heat the space. The warmer the water the more efficient the system is. The site presently pays \$15.6/mmbtu for gas and \$45.1/mmbtu for electric. The natural gas has a loss for equipment efficiency which makes it \$19.5/mmbtu usable with 80% efficient equipment. The water source heat pump has a gain of efficiency which makes the rate \$10.7/mmbtu with equipment COP of 4.2.

It is recommended that the existing gas fired heating system be replaced with a hot water roof top unit. This new unit shall be supplied with hot water from water to water heat pumps. The new unit shall use plant water, that shall have a minimum temperature of 40°F, to heat water for the roof top unit. The new unit shall have a COP (coefficient of performance) of 4.2. The replacement unit shall be sized to replace the existing equipment at approximately 400,000 btu/hr of heating.

The existing heating and ventilation equipment is past the expected service life and is due to be replaced. In some cases the equipment has failed and has been replaced with a unit heater instead of a heating and ventilation make-up air unit.

CDM modeled the existing heating system as gas fired and 80% AFUE and a heat pump with minimum COP of 4.2. The estimated heating load and system capacity are constant in both heating systems. The utility rate is estimated as a constant rate for each kWh and therm consumed.

Resulting anticipated savings and payback are shown in Table 1.

Table 4.3.9.1-1: Head Works Process Water Heat Pump Payback	
Predicted Annual Savings (kWh)	-56,916
Predicted Annual Savings (therms)	10,786
Total Annual Savings	\$8,061
Incremental Capital Cost of Upgrade	\$109,336
Incentives**	\$6,000
Cost of Upgrade	\$103,336
Simple Payback	12.8
Lifetime Energy Savings (24 years)*	\$201,126
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	3.63%
Internal Rate of Return (IRR)	6.48%
Net Present Value (NPV)	\$43,680

*Assumes 3% yearly inflation on electricity costs and
2% yearly inflation on natural gas costs

** Based upon a potential installation configuration. Incentives offered on case to case basis.

4.3.9.2 Head Works Process Water Preheat

The plant water averages 53°F during the winter. The make-up air during the winter can be as low as -7°F. Drawing the make-up air through the plant water preheats the air and reduces the mechanical heating required for the space. The water must be once through to prevent freezing of the coil. This increases the process water used at the site.

It is recommended that the Headworks building make-up air unit be fitted with a make-up air unit with a preheating coil. This new unit shall be supplied with plant water. The plant water will be used at a flow of 7 to 30 gpm.

The existing heating and ventilation equipment is past the expected service life and is due to be replaced. In some cases the equipment has failed and has been replaced with a unit heater instead of a heating and ventilation make-up air unit.

CDM modeled the reduction in the heating required for the various outdoor air temperatures. The estimated heating savings do not include any additional fan or pump energy that may be required. The savings also does not included any costs of the additional plant water usage or treatment.

Resulting anticipated savings and payback are shown in Table 1.

Table 4.3.9.2-1: Head Works Plant Water Preheat Payback	
Predicted Annual Savings (therms)	1,583
Predicted Annual Process water (gallons)	2,218,715
Total Annual Savings	\$2,469
Incremental Capital Cost of Upgrade	\$25,078
Incentives**	\$0
Cost of Upgrade	\$25,078
Simple Payback	10.2
Lifetime Energy Savings (24 years)*	\$39,440
Annual Maintenance Cost Savings (AMCS)	\$-250
Annual Return on Investment (AROI)	2.18%
Internal Rate of Return (IRR)	5.56%
Net Present Value (NPV)	\$5,131

*Assumes 2% yearly inflation on natural gas costs

4.4 Alternative Energy Sources

4.4.1 Photovoltaic Solar Energy System Overview

Photovoltaic (PV) cells convert energy in sunlight directly into electrical energy through the use of silicon semi conductors, diodes and collection grids. Several PV cells are then linked together in a single frame of module to become a solar panel. PV cells are able to convert the energy from the sun into electricity. The angle of inclination of the PV cells, the amount of sunlight available, the orientation of the panels, the amount of physical space available and the efficiency of the individual panels are all factors that affect the amount of electricity that is generated.

Based on the estimated cumulative total available roof area, calculations determine that the installation of twenty nine (29) systems with a total rating of approximately 3.1 MW (dc) will be appropriate for the twenty nine (29) City owned buildings listed below.

As part of this energy audit, a preliminary engineering feasibility study of the sites outlined above to support solar generation facilities was completed consisting of the following tasks:

1. Site visit by CDM engineers.
2. Satellite Image Analysis and Conceptual design and layout of the photovoltaic system
3. Design and construction cost estimates

4. Determine a preliminary design for the size and energy production of the solar system.

The total unobstructed available area of each section of the roof with southern exposure was evaluated. It is important to note the following:

1. The structural integrity of the roofs was not confirmed during CDM's site visit. The City owned buildings may require some degree of roofing work prior to the implementation of a solar system.
2. In the case of the flat areas, the PV system sizing and kWh production was calculated assuming the installation of a crystalline module facing south direction (180 Degree Azimuth) and tilted approximately 20 degrees to allow better rain water shedding and snow melting. Please note that the kWh production as well as system size may differ significantly based on final panel tilt selected during the RFP and design phase.
3. Blended electric rates were used based on actual utility bills and were applied for the facility.

The following is a preliminary study on the feasibility of installing PV solar systems at twenty nine (29) City owned buildings to generate a portion of each facility's electricity requirements. Each system is designed to offset the electric purchased from the local utility and not as a backup or emergency source of power.

In order to determine the best location for the installation of the PV solar system, a satellite image analysis and site walkthrough of the buildings was performed during the week of August 29th, 2010.

Also, as part of the assessment, CDM investigated possible locations for electrical equipment that need to be installed such as combiner boxes, disconnect switches and DC to AC inverters. Consideration was also given to locations of interconnection between the solar system and building's electrical grid.

Table 4.4-1 provides a summary of all the proposed PV systems for Bristol, CT. The Project Team conducted facility walkthroughs and utilized satellite image analysis and to determine the estimated total available area, then calculated the potential capacity of a solar array system for each location. It should be noted that the interconnection point for the PV system will require a modification or replacement of the existing service entrance equipment wherein the PV system feeder connections will have to be made after the main circuit breaker, and protective relaying will also have to be implemented. Any connection points would have to meet NEC and local utility requirements. Further investigation and verification of existing electrical equipment at each location would be required prior to implementation of a PV system. See section 2 for a detailed description of each building's roof type.

Table 4.4-1 Proposed Solar System Summary				
Department	Location	Roof Type	Electrical Service Size	Proposed PV Array Size (kW DC)
City Hall	City Hall	Flat	480V, 1600A	93.7
City Hall	City Hall Annex	Flat	208Y120V, 400A	22.5
Water Dept	Water Department Main Office & Garage	Flat	208Y120V, 400A	48
Water Dept	Water Filtration Plant	Flat	480V, 600A	354.6
Parks	Rockwell Park	Flat	208Y120V, 400A	10
Fire	Engine 2	Flat	208Y120V, 400A	23
Fire	Engine 3	Flat	208Y120V, 400A	16.2
Fire	Engine 4	Flat	208Y120V, 400A	25
Fire	Engine 5	Flat	208Y120V, 400A	24.2
Senior Center	Senior Center	Flat & Sloped	208Y120V, 1600A	320.8
Library	Main Library	Flat & Sloped	208Y120V, 1200A	20.2
Public Works	Animal Control	Flat	208Y120V, 400A	14.4
Public Works	City Yard	Flat	208Y120V, 800A	136.4
WPCP	Plant	Flat	480V, 2000A	1,884.90
WPCP	Broad St Pump Station	Flat	480V, 600A	28.8
WPCP	Cherry Hill Pump Station	Flat	208Y120V, 400A	2.3
WPCP	Cross Pump Station	Flat	208Y120V, 400A	2.3
WPCP	Drayla Pump Station	Flat	208Y120V, 200A	2.3
WPCP	East Main Pump Station	Flat	208Y120V, 400A	6.8
WPCP	Ivy Pump Station	Flat	208Y120V, 400A	2.3
WPCP	Julia Pump Station	Flat	208Y120V, 400A	2.3
WPCP	Lake Pump Station	Flat	208Y120V, 400A	2.3
WPCP	Lufkin Pump Station	Flat	208Y120V, 400A	2.3
WPCP	Matthews Pump Station	Flat	208Y120V, 400A	2.3
WPCP	Middle Pump Station	Flat	208Y120V, 400A	2.3
WPCP	Minor Pump Station	Flat	208Y120V, 400A	2.3
WPCP	Boivin Pump Station	Flat	208Y120V, 400A	2.3
WPCP	Tyler Pump Station	Flat	208Y120V, 400A	2.3

4.4.1.1 Basis for Design and Calculations

The proposed Photovoltaic (PV) Power systems outlined above for each facility are comprised of the PV arrays, inverter(s), combiner boxes, disconnect switches, and all of the necessary wiring and interconnection equipment. The solar panels will be mounted onto the roof. The array outputs will feed power into the DC to AC inverters. AC outputs will then be connected at each building's electrical service as outlined above. Pending further engineering analysis of the roofs, it is yet to be determined if the solar arrays will be installed using a self-ballasting system, or roof penetration system, or a combination of both.



Fixed Tilt System

The most common roof mounted system is referred to as a ("fixed tilt") system typically mounted to a metal rack that can be fixed at a specific angle. There are also ("tracking systems") or movable along one or two axes to follow the position of the sun during the day. For a roof-mounted PV system, tracking systems are very rarely installed and are usually used for ground-mounted systems only, as they require more complex racks and higher maintenance costs. For the "fixed" system, the tilt is determined based on the following factors: geographical location, total targeted kWh production, seasonal electricity requirements and weather conditions such as wind. Ideally, the module tilt for Bristol, CT should be 25-35 degrees with an azimuth as close as possible to 180 (south); however, experience has shown that PV systems are typically installed at a tilt of 20 degrees or lower in order to avoid any issues with wind and to maximize total system size

The type of PV panels and equipment used to mount the system shall be determined based on the wind conditions and structural integrity of the roof determined during the design phase of the project. In general, penetration/tie-down systems, non-penetrating ballasted type systems, or a combination of the two should be considered.

Calculation of PV System Yield

An industry accepted software package PV Watts was used to calculate projected annual electrical production of the crystalline silicon PV system in its first year, as summarized in Table 4.4-2. The system was designed to provide maximum kWh production based on available roof space.

Table 4.4-2
Summary of Solar (PV) Systems

Department	Location	Square Footage Available (ft2)	Size (kW DC)	First Year Solar kWh	Energy Savings	RECs	ARO I	IRR	NPV	Lifetime Savings
City Hall	City Hall	9,367.6	93.7	108,355.0	\$19,085.1	\$2,708.9	(2.34%)	N/A	(\$733,423.55)	\$695,830.2
City Hall	City Hall Annex	2,250.0	22.5	26,025.7	\$4,928.8	\$650.6	(2.66%)	N/A	(\$263,252.10)	\$179,701.3
Water Dept	Water Department Main Office & Garage	4,800.0	48.0	55,521.6	\$6,197.9	\$1,388.0	(3.37%)	N/A	(\$878,665.94)	\$225,969.9
Water Dept	Water Filtration Plant	35,459.0	354.6	410,154.0	\$64,188.6	\$10,253.8	(2.39%)	N/A	(\$2,612,248.58)	\$2,340,269.1
Parks	Rockwell Park	1,000.0	10.0	11,567.0	\$3,595.6	\$289.2	(2.46%)	N/A	(\$154,314.10)	\$131,091.1
Fire	Fire HQ	4,746.8	47.5	54,906.2	\$9,611.4	\$1,372.7	(2.50%)	N/A	(\$434,664.68)	\$350,424.9
Fire	Engine 2	2,295.6	23.0	26,553.2	\$452.4	\$663.8	(2.65%)	N/A	(\$265,403.37)	\$16,492.5
Fire	Engine 3	1,618.4	16.2	18,720.0	\$3,783.6	\$468.0	(2.74%)	N/A	(\$218,992.24)	\$137,947.1
Fire	Engine 4	2,500.4	25.0	28,922.1	\$5,480.2	\$723.1	(2.62%)	N/A	(\$278,571.85)	\$199,805.6
Fire	Engine 5	2,415.0	24.2	27,934.3	\$5,539.0	\$698.4	(2.57%)	N/A	(\$267,703.01)	\$201,946.6
Senior Center	Senior Center	32,078.4	320.8	371,050.6	\$71,944.3	\$9,276.3	(2.02%)	N/A	(\$2,057,792.68)	\$2,623,034.8
Library	Main Library	2,018.9	20.2	23,352.6	\$4,070.4	\$583.8	(2.81%)	N/A	(\$257,106.25)	\$148,404.0
Public Works	Animal Control**	1,440.0	14.4	16,656.5	\$3,049.8	\$416.4	(2.91%)	N/A	(\$215,875.22)	\$111,192.5
Public Works	City Yard	13,644.0	136.4	157,820.0	\$31,027.4	\$3,945.5	(2.08%)	N/A	(\$937,311.38)	\$1,131,236.9
WPCP	Plant	188,489.0	1,884.9	2,180,250.7	\$335,662.8	\$54,506.3	(2.38%)	N/A	(\$13,473,223.92)	\$12,238,020.2
WPCP	Broad St Pump Station	2,880.0	28.8	33,312.9	\$6,034.4	\$832.8	(2.62%)	N/A	(\$308,240.16)	\$220,010.1
WPCP	Cherry Hill Pump Station	225.0	2.3	2,602.6	\$452.4	\$65.1	(3.69%)	N/A	(\$139,752.06)	\$16,492.5
WPCP	Cross Pump Station	225.0	2.3	2,602.6	\$452.4	\$65.1	\$0.0	N/A	(\$139,752.06)	\$16,492.5
WPCP	Drayla Pump Station	225.0	2.3	2,602.6	\$452.4	\$65.1	\$0.0	N/A	(\$139,752.06)	\$16,492.5
WPCP	East Main Pump Station	675.0	6.8	7,807.7	\$9,913.0	\$195.2	0.95%	N/A	\$26,416.40	\$16,492.5
WPCP	Ivy Pump Station	225.0	2.3	2,602.6	\$452.4	\$65.1	\$0.0	N/A	(\$139,752.06)	\$16,492.5
WPCP	Julia Pump Station	225.0	2.3	2,602.6	\$452.4	\$65.1	\$0.0	N/A	(\$139,752.06)	\$16,492.5
WPCP	Lake Pump Station	225.0	2.3	2,602.6	\$452.4	\$65.1	\$0.0	N/A	(\$139,752.06)	\$16,492.5
WPCP	Lufkin Pump Station	225.0	2.3	2,602.6	\$452.4	\$65.1	\$0.0	N/A	(\$139,752.06)	\$16,492.5
WPCP	Matthews Pump Station	225.0	2.3	2,602.6	\$452.4	\$65.1	\$0.0	N/A	(\$139,752.06)	\$16,492.5
WPCP	Middle Pump Station	225.0	2.3	2,602.6	\$452.4	\$65.1	\$0.0	N/A	(\$139,752.06)	\$16,492.5
WPCP	Minor Pump Station	225.0	2.3	2,602.6	\$452.4	\$65.1	\$0.0	N/A	(\$139,752.06)	\$16,492.5
WPCP	Boivin Pump Station	225.0	2.3	2,602.6	\$452.4	\$65.1	\$0.0	N/A	(\$139,752.06)	\$16,492.5
WPCP	Tyler Pump Station	225.0	2.3	2,602.6	\$452.4	\$65.1	\$0.0	N/A	(\$139,752.06)	\$16,492.5

*3% yearly inflation on electricity costs
**Aggregate utility cost assumed to be \$0.18/kWh.

Total Costs

It should be noted that construction costs are only estimates based on historic data compiled from similar installations, and engineering opinion. Additional engineering and analysis is required to confirm the condition of the roofs, structural integrity of the roofs, the system type, sizing, costs and savings. Budget costs assume existing roofs are structurally sound, do not need to be replaced, and can accommodate a solar system. For illustration purposes, a draft financial analysis pro forma is attached outlining all project costs and revenues.

Table 4.4-2 Engineers Opinion of Probable Cost

Engineers Opinion of Probable Cost	\$38,902,536

As stated above the estimated installation costs are based on significant experience with the pricing of solar installations in New Jersey, and are intended to provide the City with a realistic budget cost. A typical solar installation can vary in cost from \$7.00 - \$10.00 per watt depending on size, complexity of the system, labor rates, etc. Approximately 60-70% of that number is material costs while the balance is labor, engineering, etc. Like any installation, certain conditions can affect a price upward or downward. For purposes of this analysis the estimated installation cost does not include any roofing or structural work which may be required to maintain warranties or for additional structural support. CDM has included a budget of \$9/watt for the solar system installation with an additional estimated budget of \$100,000 for potential electric service work.

Refer to Section 7 for discussion on Solar Renewable Energy Certificates and other funding financing options for solar projects, including a new ARRA grant program. The financial model in Appendix I provides an annual forecast illustration of project revenues and costs for 25 years.

4.4.2 On-Site Wind Power Generation

On-site wind power generation typically utilizes a form of turbine, which is rotated with the flow of wind across it, this rotational force powers a generator, producing DC electricity. The DC electricity is then converted into AC electricity, which can be used for commercial power, or can be fed back into the power grid, reducing the overall electric demand. The size of the turbine is proportional to the amount of wind and concurrently the amount of energy it can produce.



CDM has determined that it is not feasible for the City of Bristol to install wind turbine energy systems at its facilities.

This is primarily due to 31 year payback for averaged wind speeds. There are many other incentives that could possibly provide additional funding which would reduce the payback period further.

Because the City does not have a large area for installation of a larger wind turbine at any of the two locations surveyed for the audit, a small 5kW wind turbine was chosen. A turbine of this size could be installed in most locations. Depending on area available, and funding, the A may choose to install more than one wind turbine on the premises.

Utilizing NASA's Atmospheric Science Data Center online wind mapping tool, it was determined that the local average wind speeds for the City of Bristol ranged from 4.2 m/s to 5.17 m/s at 30 meters above the ground. In general, around 7mph of average wind speed, as determined over the course of a year, is necessary to "fuel" the turbine. These values fall within the range of feasibility for installation of a new wind turbine system.

For the purposes of this feasibility analysis, CDM chose a 5kW Endurance S-343 wind turbine. Please refer to Appendix M for vendor information. This turbine size is used most often for small commercial applications. Power Curve data was determined through the use of the product specification sheets on vendor websites. Actual turbine size, height, location, and manufacturer should be determined upon design of a wind turbine system.

The estimated wind speed data, associated wind probability distribution function (weibull value), turbulence losses, and other relevant data were then incorporated into Wind Cad to estimate the annual output for the wind turbine. Refer to Appendix J for Wind Cad Modeling.

Table 4.4-3 includes a simple payback analysis for the installation of one wind turbine energy system. Refer to Appendix J for a more detailed wind turbine financing spreadsheet, including utility cost avoidance and REC's.

Table 4.4-3: Simple Payback Analysis for Wind Turbine Energy System			
Parameter	Wind Turbine (Minimum Site Wind Speed – 4.2 m/s)	Wind Turbine (Maximum Site Wind Speed – 5.2 m/s)	Wind Turbine (Average Site Wind Speed – 4.6m/s)
Engineer's Opinion of Probable Cost	\$71,995	\$71,995	\$71,995
1 st Year Production	5,437 kWh	9,756 kWh	7,249 kWh
Annual Estimated Electric Savings	\$1,582.2	\$2,839	\$2,110
Annual Estimated REC Revenue	\$136	\$244	\$181
Project Simple Payback	42 Years	23 Years	31 Years
Annual Return On Investment (ARO)	(1.6%)	0.28%	(0.8%)

Table 4.4-3: Simple Payback Analysis for Wind Turbine Energy System			
Parameter	Wind Turbine (Minimum Site Wind Speed – 4.2 m/s)	Wind Turbine (Maximum Site Wind Speed – 5.2 m/s)	Wind Turbine (Average Site Wind Speed – 4.6m/s)
Lifetime Energy Savings (25 years)	\$57,686	\$103,508	\$76,911
Internal Rate of Return (IRR)	(1.57%)	2.65%	0.40%
Net Present Value (NPV)	(\$33,563)	(\$3,035)	(\$20,756)

*Refer to Appendix J for Wind Cad Modeling

It should be noted that CDM used only REC values in determining simple payback periods. As stated above, other incentives and financial programs such as Power Purchase Agreements are available to help finance this installation. For example, if a Power Purchase Agreement is completed, the private company financing the project would benefit from the 30% tax credit. Other incentives such as CREB's and first year usage incentives could be available to the City in lowering the payback period. Refer to www.dsireusa.org for an extensive listing of possible incentives for the Connecticut area.

It should also be noted that the wind turbine represented above is for feasibility purposes only. If the City decides to install a wind turbine, different mounting heights, turbine sizes, and manufacturers should be considered. In addition, permits may be required for installation according to local zoning laws. The FAA must also be notified in order to give clearance for the tower, and for installation of aviation safety lights if necessary.

4.5 Motor Upgrades and VFD Additions

The goal of this section is to present any energy conservation measures related to upgrading motors to premium efficiency models, and adding variable frequency drives (VFD) that may also be cost beneficial.

To model the expected energy savings from upgrading motors to premium efficiency models, and the addition of VFDs, MotorMaster+ 4.0 software was utilized. Additional installation and labor costs were modeled using CostWorks software.

Additional benefits when adding VFDs include removal of traditional motor starters, lower stress levels on the motor bearings and windings, and a decrease in stress and wear on the motor/pump.

Application of a VFD to a pump results in a cubic power reduction with speed, where a 1% reduction in pump speed, will result in a 4% reduction in energy usage required to drive the pump. For the pumps which we added VFDs at the Bristol sites, we assumed a 25% decrease in energy usage, which results in a 6.25% reduction in pump horsepower.

Please note that the Engineer's Estimate of Probable Construction Costs presented herein are estimates based on historic data compiled from similar installations and

engineering opinions. Additional engineering will be required for each measure identified in this report and final scope of work and budget cost estimates will need to be confirmed prior to the coordination of project financing.

In addition, several of the motors surveyed had unreadable nameplate data. Therefore, CDM has assumed standard NEMA efficiencies for these motors for analysis. Refer to Appendix H for individual motor and VFD information.

4.5.1 Water Pollution Control Plant

It is recommended that the existing motors at the Water Pollution Control Plant be upgraded to high efficiency standards to create energy savings potential for the City.

The combined annual energy savings for this option is as follows:

Motor Upgrades: 49.6 kW, 140,929 kWh and \$21,697

Refer to Appendix L for more information regarding motor annual energy savings.

The following Table, Table 4.5-1, summarizes a simple payback analysis assuming the implementation of all recommended motor upgrades for the Water Pollution Control Plant. For more information about the upgrades and a complete breakdown of simple payback and savings per motor, refer to Appendix H.

Table 4.5-1 Water Pollution Control Plant Motor Upgrades***	
Engineer's Opinion of Probable Cost	\$243,924
Incentive	-\$5,500*
Total Cost	\$238,424
Annual Energy Savings	\$21,967
Simple Payback	11 years
Annual Return on Investment (AROI)	2.42%
Lifetime Energy Savings (15 years)**	\$403,538
Internal Rate of Return (IRR)	6.86%
Net Present Value (NPV)	\$77,550

* Additional incentives, based on eligibility, are available through CL&P, see Appendix K.

**3% yearly inflation on electricity costs

***See Appendices H for Upgrade Analyses, & L & M for ECRM Financial Analyses

It should also be noted that the Annual Energy Savings assume the annual hours per year of operation as outlined under the columns entitled “Yearly Runtime” in Appendix H.

4.5.2 Water Pollution Control Plant - Pump Stations

It is recommended that the following existing outdoor process motors at the Water Pollution Control Plant - Pump Stations be upgraded to high efficiency standards to create energy savings potential for the City.

The annual energy savings for this option is as follows:

Motor Upgrades: 99.6 kW, 105,614 kWh and \$20,470

The following Table, Table 4.5-2, summarizes a simple payback analysis assuming the implementation of all recommended Water Pollution Control Plant - Pump Stations motors. For more information about the upgrade and a complete breakdown of simple payback and savings per motor, refer to Appendix H.

Table 4.5-2 Water Pollution Control Plant - Pump Stations Motor Upgrades***	
Engineer’s Opinion of Probable Cost	\$301,103
Incentive	(\$3,010)*
Total Cost	\$298,093
Annual Energy Savings	\$20,470
Simple Payback	14.6 years
Annual Return on Investment (AROI)	0.2%
Lifetime Energy Savings (15 years)**	\$380,723
Internal Rate of Return (IRR)	3.0%
Net Present Value (NPV)	\$16.2

* Additional incentives, based on eligibility, are available through the CL&P, see Appendix K.

**3% yearly inflation on electricity costs

***See Appendices M for Upgrade Analyses, & L & M for ECRM Financial Analyses

It should be noted that the Annual Energy Savings assume the annual hours per year of operation as outlined under the columns entitled “Yearly Runtime” in Appendix H.

4.5.3 Water Treatment Plant - High Service Pump Station

It is recommended that the following existing motors at the Water Treatment Plant - High Service Pump Station be upgraded to high efficiency standards to create energy savings potential for the City.

The combined annual energy savings for this option is as follows:

Motor Upgrades: 1.82 kW, 7,979 kWh and \$1,249

The following Table, Table 4.5-3, summarizes a simple payback analysis assuming the implementation of all recommended motor upgrades for the Water Treatment Plant - High Service Pump Station. For more information about the upgrade and a complete breakdown of simple payback and savings per motor, refer to Appendix H.

Table 4.5-3 Water Treatment Plant - High Service Pump Station Motor Upgrades***	
Engineer's Opinion of Probable Cost	\$32,850
Incentive	(\$1,040)*
Total Cost	\$31,809.8
Annual Energy Savings	\$1,248.7
Simple Payback	25.4 years
Annual Return on Investment (AROI)	(2.74%)
Lifetime Energy Savings (15 years)**	\$23,225
Internal Rate of Return (IRR)	(3.48%)
Net Present Value (NPV)	(\$13,624.3)

* Additional incentives, based on eligibility, are available through CL&P, see Appendix K.

**3% yearly inflation on electricity costs

***See Appendices H for Upgrade Analyses, & L & M for ECRM Financial Analyses

It should be noted that the Annual Energy Savings assume the annual hours per year of operation as outlined under the columns entitled "Yearly Runtime" in Appendix H.

4.5.4 Water Treatment Plant - Pump Stations and Well Houses

It is recommended that the following existing motors at the Water Treatment Plant - Pump Stations and Well Houses be upgraded to high efficiency standards to create energy savings potential for the City.

The combined annual energy savings for this option is as follows:

Motor Upgrades: 7.85 kW, 31,918 kWh and \$7,624.3

The following Table, Table 4.5-4, summarizes a simple payback analysis assuming the implementation of all recommended motor upgrade for the Water Treatment Plant - Pump Stations and Well Houses. For more information about the upgrade and a complete breakdown of simple payback and savings per motor, refer to Appendix H.

Table 4.5-4 Water Treatment Plant - Pump Stations and Well Houses Motor Upgrades***	
Engineer's Opinion of Probable Cost	\$84,540
Incentive	(\$7,624.3)*
Total Cost	\$82,199
Annual Energy Savings	\$7,624.3
Simple Payback	10.8 years
Annual Return on Investment (AROI)	2.61%
Lifetime Energy Savings (15 years)**	\$141,804
Internal Rate of Return (IRR)	7.14%
Net Present Value (NPV)	\$28,835

* Additional incentives, based on eligibility, are available through the CL&P, see Appendix K.

**3% yearly inflation on electricity costs

***See Appendices M for Upgrade Analyses, & L & M for ECRM Financial Analyses

It should be noted that the Annual Energy Savings assume the annual hours per year of operation as outlined under the columns entitled "Yearly Runtime" in Appendix H.

4.6 Additional Measures

It may be possible to reduce the plug load of the facilities even further with the implementation of smart strips, energy star appliances, 'Vending Misers' and computer power management software.

4.6.1 Smart Strips

Smart Strips save energy by electronically unplugging all of the devices that are plugged into the "Automatically Switched outlets" when the device plugged into the control outlet is turned off. It is important to note that CDM is not suggesting that computers be plugged into the automatically switched off outlets, as there would be potential for the computers to be shut off mid-operation. There are a vast amount of

computer peripherals that are typically left on after a computer is shut off, including monitors, scanners, printers and DSL/Cable modems. These peripherals can be plugged into the automatic outlets.

A standard Smart Strip has one 'control' outlet, six (6) outlets that are automatically switched off when the control device is and three (3) outlets that are always hot. An example of how the City can implement the use of Smart Strips in office or library settings is to plug a computer into the control outlet, five (5) monitors and a personal printer (8 W in standby mode) into the automatic outlets and three (3) computers into the always hot outlets. An LCD monitor can use up to 34W; in standby mode the monitor utilizes 1 – 2W. A CRT monitor typically utilizes around 75W. The following Table 4.6-1 summarizes the payback of a Smart Strip, assuming 5 LCD monitors and 1 printer are automatically powered down that would otherwise been left on 8 hours/day and in standby mode 16 hours/day, 5 days/week for 9 months.

Table 4.6-1 Simple Payback

Smart Strip Application Example	
Predicted Annual Savings – 5 LCD monitors, 1 printer (kWh)	611
*Total Annual Savings	\$107
Initial Capital Cost	\$40
Simple Payback (months)	4.5
Lifetime Energy Savings (15 years)	\$1,990
Net Present Value	\$1,646

*Aggregate Cost of \$.1761/kWh taken from City Hall

The following Table 4.6-2 summarizes other applications for the Smart Strip that may be applicable throughout the buildings:

Table 4.6-2 Applications for Smart Strips

Control Outlet	Switched Outlets
Computer	Monitors, printers, scanners, lamps
TV	VCR, DVD player, cable box
Lamp	Stereo, space heater

4.6.2 Energy Star Appliances

The City should consider standardizing on the use of Energy Star appliances. Replacement of existing appliances, such as the refrigerators, copiers and printers throughout the City facilities, is recommended on an 'as-needed' basis. Energy Star refrigerators and freezers, for example, use up to 40% less energy than models built in

2001. Energy Star appliances will not only reduce the City's utility bills, but will also outperform standard appliances due to the improved design and advanced technologies.

In addition to replacing old appliances with Energy Star appliances, the following two maintenance procedures can work to save the energy consumed by the refrigerators. One is cleaning dirty condenser coils, twice a year. A refrigerator's condenser coils and cooling fins are located either under the unit behind a grille in the front or on the back of the appliance. The coils can be cleaned with a brush or vacuum cleaner hose. The second source of wasted energy associated with a refrigerator is the door seal. Realigning the door or replacing a no longer airtight door seal will work to improve energy efficiency.

4.6.3 'Vending Misers'

It may also be considered that 'Vending Misers' be purchased and utilized for vending machines throughout the City facilities. Vending machines were noted at City Hall, the Water Department office and Engine Company 5, as examples. A 'Vending Miser' powers down a vending machine when the surrounding area is unoccupied and automatically repowers when the area is occupied, utilizing an infrared sensor. Similarly to occupancy sensors on lighting fixtures; however, the vending miser also monitors the ambient temperature while the vending machine is powered down and uses this as sort of an internal thermostat to power up the machine and ensure that the drinks remain cold. Additionally, the 'Vending Miser' monitors electrical current to ensure that the vending machine isn't powered down while the compressor is running and that the cooling cycle is run to completion before powering down the vending machine.

Vending machines with lights typically require 400 W, which relates to an annual consumption per vending machine of 3,504 kWh. This annual consumption assumes operation year round. The following Table 4.6-3 summarizes the payback associated with utilizing two (2) 'Vending Misers' at the Water Department Office. The savings estimate of 35% is conservative and is accounts for 'high traffic'.

Table 4.6-3: Simple Payback 'Vending Misers' at Water Department Office	
Predicted Annual Savings – 2 Vending Misers (kWh) (35% annual savings)	2,453
Total Annual Savings	\$284
Initial Capital Cost	\$432
Simple Payback (years)	1.5
Lifetime Energy Savings (5 years – based on warranty period)	\$1,508
Net Present Value (NPV)	\$988

4.6.4 Computer Power Management Software

Computer power management software controls the amount of time a group of desktop or laptop computers are powered up. The installation of power management software is simple, and only requires a small software package to be installed on each computer connected to a specific network. Software packages such as Night Watchman from 1e Software provide remote control of computers connected to a network, allowing for power down schedules to be setup, which can be used to optimize energy savings by turning off computers at a designated time. The power management software can also store energy/computer usage statistics in a database that can be used for energy usage analysis. CDM recommends the installation of PC power management software at the City Hall Facility.

Table 4.6-4 includes an example simple payback analysis for the installation of PC power management software at City Hall. These numbers do not reflect the actual number of computers at City Hall.

Table 4.6-4 Summary of PC Power Management Systems							
Site	Engineers Opinion of Probable Cost	Annual Energy Savings	Lifetime Energy Savings (5 Years)*	Simple Payback (Years)	Annual Return On Investment (ARO I)	Net Present Value (NPV)	Internal Rate of Return (IRR)
City Hall	\$1,085.6	\$2,143	\$11,378	0.5	177.4%	\$9,317.8	199.5%

*3% yearly inflation on electricity costs

4.7 Building Envelope Recommendations and Improvements

The goal of this section is to present energy reduction and cost saving measures by increasing the performance of building envelope materials that may be cost beneficial. These building envelope improvements may include windows, doors, insulation, wall and roof upgrades or replacement.

4.7.1 City Hall

4.7.1.1 City Hall Building Envelope Improvements

It is recommended that all single pane glass windows be upgraded and replaced with double pane insulating glass with fixed window frame assemblies. This will increase the overall thermal resistance of the building envelope and decrease overall heating and cooling through the year. The building currently utilizes exterior storms which provide additional thermal resistance by forming an air pocket between the building windows. This acts as a thermal cushion between the outside climate and indoor climate while adding additional weather protection. It is recommended, when a future window replacement is in consideration, to install exterior storms.

In addition, the building conceals each floor level with spandrel glass which is a film applied or tinted sheet of glass. It is recommended to use double pane insulating glass in this application or it would be more cost effective to install an insulated metal panel assembly where the existing spandrel glass occurs. Installing an insulated metal panel assembly will provide a higher thermal resistance value resulting in higher energy cost savings.

All single pane glass door entrance storefronts should be replaced with double pane insulating glass doors.

The estimated installed cost, projected energy and cost savings, and simple payback are included in Table 4.7.1.1-1 and Table 4.7.1.1-2. The supporting calculations are included in Appendix L and Engineer's Opinion of Probable Construction Cost are included in Appendix M. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing window and door replacements.

Table 4.7.1.1-1 City Hall Window Replacement	
Predicted Annual Savings (Oil)	44.3
Predicted Annual Savings (Electricity)	1140
Total Annual Savings	\$279
Initial Capital Cost of Upgrade	\$698,625
Incentives	\$0
Cost of Upgrade	\$698,625
Simple Payback	NA
Lifetime Energy Savings (20 years)*	\$7,298
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	-4.13%
Internal Rate of Return (IRR)	N/A
Net Present Value (NPV)	\$693,206

*Assumes 2% yearly inflation on natural gas costs

Table 4.7.1.1-2 City Hall Window Replacement with Insulated Spandrel Panel	
Predicted Annual Savings (Oil)	60.7
Predicted Annual Savings (Electricity)	1580
Total Annual Savings	\$386
Initial Capital Cost of Upgrade	\$407,531
Incentives	\$0
Cost of Upgrade	\$407,531
Simple Payback	NA
Lifetime Energy Savings (20 years)*	\$10,084
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	-4.07%
Internal Rate of Return (IRR)	N/A
Net Present Value (NPV)	\$400,044

*Assumes 2% yearly inflation on natural gas costs

4.7.2 Police Department

4.7.2.1 Police Court Building Envelope Improvements

It is recommended that all insulating double pane glass operable windows be upgraded and replaced to double pane insulating glass with fixed window frame assemblies. Per conversations with the occupants of the facility they say that the current window frame assemblies are awfully drafty. This could be caused by degraded seals or enlarged gaps in the seals around the operable window frame. Upgrading to a fixed window frame assembly will minimize this occurrence.

In addition, there is single pane glass within these operable units, so it would be beneficial to replace the entire assembly to a fixed frame assembly with double pane insulating glass. This will increase the overall thermal resistance of the building envelope and decrease overall heating and cooling through the year.

All single pane glass door entrance storefronts should be replaced with double pane insulating glass doors.

The estimated installed cost, projected energy and cost savings, and simple payback are included in Table 4.7.2.1-1. The supporting calculations are included in Appendix

L and Engineer's Opinion of Probable Construction Cost are included in Appendix M. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing window and door replacements.

Table 4.7.2.1-1 Police Department Window Replacement	
Predicted Annual Savings (Oil)	20.7
Predicted Annual Savings (Electricity)	400
Total Annual Savings	\$99
Initial Capital Cost of Upgrade	\$90,000
Incentives	\$0
Cost of Upgrade	\$90,000
Simple Payback	NA
Lifetime Energy Savings (20 years)*	\$2,566
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	-4.06%
Internal Rate of Return (IRR)	N/A
Net Present Value (NPV)	\$88,077

*Assumes 2% yearly inflation on natural gas costs

4.7.3 Fire Department

4.7.3.1 Fire Headquarters and Engine Companies Building Envelope Improvements

It is recommended that all single pane glass windows and storefront door glass be upgraded to double pane insulating glass. Operable windows seals should be redone or the windows should be upgraded to a fixed window frame assembly with double pane insulating glass.

No significant energy and cost savings were found during the analysis of the fire headquarters and engine companies when apply the window upgrades to the eQuest models.

Engineer's Opinion of Probable Construction Cost are included in Appendix M. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing window and door replacements.

4.7.4 Libraries

4.7.4.1 Mancross Public Library

From the assessment of the building envelope and existing thermal resistance from section 2 the building is thermally weak in all areas. It is recommended that the entire exterior wall within the library be finished with gypsum wall board, metal studs and rigid insulation to a minimum thermal resistance value of an R-20.

A second option to improve the energy performance is to improve the roofs thermal resistance. To do this, it is recommended to install new fiberglass board, rigid insulation, sheathing and asphalt shingles to a minimum thermal resistance value of an R-20.

The estimated installed cost, projected energy and cost savings, and simple payback are included in Table 4.7.4.1-1. The supporting calculations are included in Appendix L and Engineer's Opinion of Probable Construction Cost are included in Appendix M. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing wall and roof upgrades.

Table 4.7.4.1-1 Mancross Public Library	
Predicted Annual Savings (Gas)	2,164
Predicted Annual Savings (Electricity)	20,340
Total Annual Savings	\$7,236
Initial Capital Cost of Upgrade	\$317,688
Incentives	\$0
Cost of Upgrade	\$317,688
Simple Payback	31
Lifetime Energy Savings (30+ years)*	\$315,899
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	-1.89%
Internal Rate of Return (IRR)	0.46%
Net Present Value (NPV)	\$107,013

*Assumes 2% yearly inflation on natural gas costs

4.7.5 Youth Services

4.7.5.1 Main Building

This facility is operated from a converted residential Victorian house. The only thermal weaknesses that were assessed during field observation was the lack of batt insulation in the attic of the house. The house still utilizes original single pane windows which installing double pane insulating glass would be more beneficial to climate control and energy savings, but a historical society may govern the right to do upgrades or modifications.

The estimated installed cost, projected energy and cost savings, and simple payback are included in Table 4.7.5.1-1. The supporting calculations are included in Appendix L and Engineer's Opinion of Probable Construction Cost are included in Appendix M. It's important to note that these are estimates based on building models, and further investigation is warranted before pursuing window and door replacements.

Table 4.7.5.1-1 Main Building Batt Insulation Installation	
Predicted Annual Savings (Gas)	137
Total Annual Savings	\$242
Initial Capital Cost of Upgrade	\$8,050
Incentives	\$0
Cost of Upgrade	\$8,050
Simple Payback	26
Lifetime Energy Savings (30+ years)*	\$9,828
Annual Maintenance Cost Savings (AMCS)	\$0
Annual Return on Investment (AROI)	-1.99%
Internal Rate of Return (IRR)	2.15%
Net Present Value (NPV)	\$994

*Assumes 2% yearly inflation on natural gas costs

4.7.6 Water Pollution Control

4.7.6.1 Administration Building

It is recommended that the hollow metal door be replaced. This door has a hole caused by corrosion and does not seal properly.

No significant energy and cost savings were found during the analysis of the Water Pollution Control Administration building when apply the door replacements to the eQuest models.

The estimated installed cost can be found in Appendix M Engineer's Opinion of Probable Construction Cost. It's important to note that these are estimates and further investigation is warranted before pursuing door replacements.

Section 5

Evaluation of Energy Purchasing and Procurement Strategies

5.1 Energy Deregulation

In 2000, the State of Connecticut Department of Public Utility Control passed an electrical restructuring act to restructure the electric power industry in Connecticut. This law, the deregulation of the market, allowed all consumers to shop for their electric supplier. The intent was to create a competitive market for electrical energy supply. As a result, utilities are allowed to charge a Generation Service Charge (GSC) and customers have the ability to choose an alternative electric supplier. Energy deregulation in Connecticut increased the energy buyers' options by separating the function of electricity distribution from that of electricity supply.

Connecticut Light & Power (CL&P) is currently the transmission and distribution supplier of electrical energy for the City of Bristol. TransCanada is providing alternative electricity supplier service for the City through 2014. Energy deregulation creates the opportunity to choose your electric generation supplier. The benefit of this is the ability to choose a supplier based on what is important to you, for example, lowest rate or how the electric generation supply is produced.

To sell electric generation service in Connecticut, electric power suppliers must be licensed by the State of Connecticut Department of Public Utility Control (DPUC). They must also be registered with the local public utility (CL&P) to sell electric service in that utility's service areas. The following is a list of some electric suppliers that are licensed with the State of Connecticut DPUC and are registered to sell electric service in the CL&P service territory:

- Choice Energy (888-565-4490)
- Clearview Energy Company (800-527-3233)
- ConEdison Solutions (866-469-4362)
- Constellation New Energy (866-237-7693)
- Direct Energy (800-571-4900)
- Discount Power, Inc. (877-259-POWER)
- Dominion (800-400-5574)
- Energy Plus (888-766-3509)
- GDF Suez Energy (866-999-8374)
- Glacial Energy (203-234-9335)
- Hess (800-437-7872)
- Horizon Power & Light (866-727-5658)
- Integrys Energy Service (888-288-0218)
- Liberty Power (866-769-3799)
- MX Energy (800-785-4373)
- NextEra Energy Services Connecticut, LLC (866-314-4392)
- North American Power (888-313-9086)

- Pepco Energy Services (703-253-1800)
- Public Power (888-354-4415)
- RBS Sempra Commodities (877-2-SEMPRA)
- Spark Energy (877-374-8013)
- Starion Energy (800-600-3040)
- Suex Energy Resources NA (866-999-8374)
- TransCanada (877-634-2928)
- Verde Energy USA (800-634-2928)
- Viridian (866-663-2508)

5.1.1 Alternate Electric Suppliers

In evaluating the potential for an alternative electric supplier, CDM contacted and requested proposals for electrical service from Glacial Energy, Discount Power Inc. and Con Edison Solutions. The objective of which was to get an overall idea of whether or not switching electric energy suppliers is an avenue that should be pursued further to obtain electrical energy cost savings.

TransCanada is currently the City's alternative energy supplier. The contract with TransCanada will remain active through December 2014. The Connecticut Conference of Municipalities (CCM) and Bay State Consulting provide administration assistance with the TransCanada contract. As other alternative electric supplier are not required to reveal pricing information to competitors, Glacial Energy, Discount Power Inc. and Con Edison Solutions were unable to obtain information in order to process an analysis for alternative energy supply. Therefore, the City should consider contacting these and other alternative electric suppliers in 2014 when the contract with TransCanada is expiring. The City may also want to consider purchasing electricity through the Capitol Region Council of Governments (CRCOG) Electricity Consortium. The first reverse auction took place in July 2009 and was conducted by World Energy Services, an aggregator licensed with the State of Connecticut DPUC and registered with CL&P. World Energy Services estimated participating CRCOG members saved more than \$400,000 over a two year contract term based on the average current market price at the time of the reverse auction.

5.1.2 Renewable Electricity Supply and Credits

The City of Bristol may want to consider purchasing 20 percent, 25 percent, 50 percent or 100 percent renewable electricity from an alternative electricity supplier. Most alternative electricity suppliers sell electricity with the minimum percentage of renewable electricity set by the Connecticut Renewable Portfolio Standard (RPS). The 2010 RPS is 14 percent renewable electricity. Purchasing renewable electricity is an alternative to installing a renewable electricity system onsite. Several Connecticut alternative electricity suppliers, including ConEdison Solutions, Discount Power, Inc. and Viridian, sell higher percentages of renewable electricity than the RPS. Renewable electricity typically costs an extra 1-2 cents per kWh depending on the percentage, although the price can be negotiated.

Alternatively, the City of Bristol could purchase renewable electricity credits (RECs) to match the amount of electricity consumed. RECs are currently offered through the CT Clean Energy Options program through Community Energy and Sterling Planet. RECs for 100 percent offset are currently sold for 1.3 cents per kWh and RECs for 50 percent offset are sold for 0.65 cents per kWh. Other percentages are available to large electricity customers. Purchasing renewable electricity or RECs would allow the City of Bristol to use renewable energy and offset greenhouse gas emissions, while eliminating the capitol cost associated with installing a renewable electricity system onsite.

5.1.3 Time-of-Day and Real-Time Rates

In 2006, the Department of Public Utility Control directed CL&P and United Illuminating (IU) to phase in mandatory time-of-day rates for residential and commercial customers. The phase-in has taken place over several years beginning with high use customers in 2008. The City of Bristol is now charged based on time-of-day rates.

Time-of-day rates are designed to reduce Connecticut's peak demand for electricity. Higher prices are charged for electricity used between noon and 8 p.m. on weekdays. The City of Bristol has a financial incentive to reduce consumption during this peak period in order to lower their electric bills. The City may consider shifting the operation of equipment off peak (8 pm to noon on weekdays and all hours on weekends), operating more efficient equipment for operations that cannot be shifted off peak, and installing solar PV systems and other renewable energy systems. These cost saving opportunities are further discussed in Section 4 of this report.

The City of Bristol may want to consider real-time rates to purchase electricity in the spot market for facilities that can shift the majority electric consumption to off peak periods. Variable Peak Pricing (VPP) is the first real-time rate offered in Connecticut and is offered to all CL&P customers. VPP is a form of time-of-day pricing that allows customers to purchase electricity on a daily basis. The VPP on-peak price for each weekday will be available the previous day on CL&P's website. Customers may choose to purchase the VPP on-peak price or the standard time-of-day on-peak price. Customers save money by shifting their usage to the cheaper off peak hours.

5.1.4 Natural Gas, Oil and Other Fuel Purchasing

The City purchases natural gas through CRCOG reverse auctions. The City purchases heating fuel oil and diesel fuel annually, with commitments to estimated consumption volumes. The City should consider continuing their participation in the CRCOG reverse auction for natural gas. The permanent program is now the largest municipal aggregation of its kind in Connecticut with more than 30 members, and participants have received substantial savings compared to comparable utility rates with a marketer. The City should consider purchasing oil and other fuels through the CRCOG as well. Contract periods vary and are posted on the CRCOG website.

5.2 Demand Response Program

Demand Response is a program through which a business can make money on reducing their electricity use when wholesale electricity prices are high or when heavy demand causes instability on the electric grid, which can result in voltage fluctuations or grid failure. Demand Response is an energy management program that compensates the participant for reducing their energy consumption at critical times. Demand Response is a highly efficient and cost effective means of reducing the potential for electrical grid failure and price volatility and is one of the best solutions to New England's current energy challenges.

The program provides at least 2 hours advance notice before curtailment is required. There is typically one event per year that lasts about 3 hours in the summer months, when demand for electricity is at its highest.

Participation in Demand Response is generally done through companies known as Curtailment Service Providers, or CSPs, who are members of ISO New England. There is no cost to enroll in the program and participation is voluntary, for instance, you can choose when you want to participate. In most cases, there is no penalty for declining to reduce your electricity use when you are asked to do so. The event is managed remotely by notifying your staff of the curtailment request and then enacting curtailment through your Building Management System. CSPs will share in a percentage of your savings, which may differ among various CSPs, since there may be costs associated with the hardware and/or software required for participation, so it is recommended that a number of CSPs be contacted to review their offers.

The City of Bristol Water Pollution Control Facility currently participates in a demand response program, in which certain facilities are operated via diesel-powered generators during demand response events. The City of Bristol may want to consider enrolling other City buildings and facilities with emergency generators in the demand response program. The City may also want to consider using their water storage tanks as a way to turn off water processing and pumping equipment during a demand response event. The City of Bristol could be paid thousands of dollars each year for expanding their demand response participation.

Section 6

Ranking of Energy Conservation and Retrofit Measures (ECRM)

6.1 ECRMs

The main objective of this energy audit is to identify potential Energy Conservation and Retrofit Measures and to determine whether or not the identified ECRM's are economically feasible to warrant the cost for planning and implementation of each measure. Economic feasibility of each identified measure was evaluated through a simple payback analysis. The simple payback analysis consists of establishing the Engineer's Opinion of Probable Construction Cost estimates; O&M cost savings estimates, projected annual energy savings estimates and the potential value of Renewable Energy Credits, if applicable. The simple payback period is then determined as the amount of time (years) until the energy savings associated with each measure amounts to the capital investment cost.

As discussed in Section 3, aggregate unit costs for electrical energy delivery and usage and natural gas delivery and usage, which accounts for all demand and tariff charges at each facility, was determined and utilized in the simple payback analyses.

All recommended ECRMs within Section 4 of the report have been ranked for possible implementation. The most attractive rankings are those with the lowest simple payback period.

Ranking of ECRMs has been broken down into the following categories:

- Water and Wastewater Process Systems
- Lighting Systems
- HVAC Systems
- Solar Systems
- Wind Systems

6.1.1 Water and Wastewater Process Systems

Table 6.1-1 includes the recommended ECRMs to provide energy savings for the water and wastewater treatment systems. Detailed discussions on these systems are presented in Section 4.1. As discussed in Section 4.1, the water treatment system recommendations mainly consisted of motor and VFD retrofits, which are included in Table 6.1-6.

Table 6.1-1 Ranking of Energy Savings Measures Summary – Water and WWTP System Retrofits					
Complex	Retrofit Cost	Incentives	Total Cost	Annual Fiscal Savings	Simple Payback (Years)
Spray Water Pumps – Programmable Timer	\$9,048	\$0	\$9,048	\$10,200	0.9
Anoxic Zone Mixing – Hyperbolic Mixers	\$282,828	(\$74,000)	\$208,828	\$23,726	8.8
UV System – Flow Pacing Integration	\$179,400	(\$31,561)	\$147,839	\$9,722	15.2
Hydroelectric System	\$323,856	(\$35,040)	\$288,816	\$7,392	39.1

1. 'Total Cost' takes into account any applicable rebates.
2. 'Annual Fiscal Savings' takes into account maintenance costs savings.

6.1.2 Lighting Systems

Table 6.1-2 includes the recommended ECRMs to provide energy savings for all building lighting systems, which include the installation of energy-efficient luminaires and occupancy sensors. A detailed discussion on building lighting systems is presented in Section 4.2.

Table 6.1-2 Ranking of Energy Savings Measures Summary – Lighting System Retrofits					
	Engineer's Opinion of Probable Cost	CL&P Rebate	Total Cost	Annual Fiscal Savings	Simple Payback
City Hall Annex - Total	\$1,208.2	(\$50.0)	\$1,158.2	\$551.5	2.1 Years
Water Department - #3 Well House - Total	\$71.9	\$0.0	\$71.9	\$34.2	2.1 Years
Water Pollution Control - Operations- Total	\$35.9	\$0.0	\$35.9	\$17.1	2.1 Years
Public Works - Transfer Station Hut - Total	\$4,854.4	\$0.0	\$4,854.4	\$2,022.7	2.4 Years
Parks and Recreation - Recreation Building - Total	\$1,036.4	\$0.0	\$1,036.4	\$414.6	2.5 Years
Bristol Fire - Engine 2 - Total	\$3,648.4	\$0.0	\$3,648.4	\$1,403.2	2.6 Years
Bristol Fire - Engine 5 - Total	\$6,147.5	(\$60.0)	\$6,087.5	\$2,254.6	2.7 Years
Bristol Fire - Engine 3 - Total	\$5,411.5	(\$60.0)	\$5,351.5	\$1,911.3	2.8 Years
Parks and Recreation - Bathhouse - Total	\$1,318.2	\$0.0	\$1,318.2	\$387.7	3.4 Years
Public Works - Hill Street - Total	\$4,869.1	(\$160.0)	\$4,709.1	\$1,308.1	3.6 Years
Police Court - Total	\$23,363.0	(\$400.0)	\$22,963.0	\$5,740.8	4.0 Years
City Hall - Total	\$10,925.7	(\$330.0)	\$10,595.7	\$2,037.6	5.2 Years
Public Works - City Yard - Total	\$12,864.2	\$0.0	\$12,864.2	\$2,473.9	5.2 Years

Table 6.1-2 Ranking of Energy Savings Measures Summary – Lighting System Retrofits					
	Engineer's Opinion of Probable Cost	CL&P Rebate	Total Cost	Annual Fiscal Savings	Simple Payback
Parks and Recreation - Rockwell Pavilion - Total	\$1,068.8	(\$20.0)	\$1,048.8	\$187.3	5.6 Years
Water Department - Water Filtration Plant - Total	\$1,919.8	(\$140.0)	\$1,779.8	\$306.9	5.8 Years
Water Department - #1 Well House - Total	\$1,894.9	(\$20.0)	\$1,874.9	\$297.6	6.3 Years
Parking Garage - Total	\$11,830.6	\$0.0	\$11,830.6	\$1,620.6	7.3 Years
Water Department - High Service Pump Station - Total	\$1,630.1	\$0.0	\$1,630.1	\$209.0	7.8 Years
Public Library - Total	\$4,582.8	(\$40.0)	\$4,542.8	\$547.3	8.3 Years
Youth Services - Main Building - Total	\$3,460.1	(\$80.0)	\$3,380.1	\$375.6	9.0 Years
Water Department - Main Office - Total	\$9,280.5	(\$110.0)	\$9,170.5	\$965.3	9.5 Years
Water Department - #4 Well House - Total	\$71.9	\$0.0	\$71.9	\$7.5	9.6 Years
Water Department - #5 Well House - Total	\$815.1	\$0.0	\$815.1	\$66.3	12.3 Years
Parks and Recreation - Muzzy Field - Total	\$12,689.1	(\$300.0)	\$12,389.1	\$938.6	13.2 Years
Public Works - Transfer Station Scale House - Total	\$2,229.6	\$0.0	\$2,229.6	\$165.2	13.5 Years
Water Department - Chemical and Control - Total	\$951.6	(\$10.0)	\$941.6	\$68.7	13.7 Years
Parks and Recreation - Rockwell Park - Total	\$7,800.0	(\$210.0)	\$7,590.0	\$538.3	14.1 Years
Public Works - Community - Total	\$543.4	(\$40.0)	\$503.4	\$33.6	15.0 Years
Parks and Recreation - Page Park Pavillion - Total	\$5,497.0	(\$200.0)	\$5,297.0	\$348.5	15.2 Years
Senior Center - Total	\$20,843.0	(\$100.0)	\$20,743.0	\$1,329.7	15.6 Years
Water Department - Generator - Total	\$1,499.6	(\$20.0)	\$1,479.6	\$91.3	16.2 Years
Water Department - #2 Well House - Total	\$743.2	\$0.0	\$743.2	\$38.5	19.3 Years
Main Library - Total	\$6,760.6	(\$240.0)	\$6,520.6	\$318.1	20.5 Years
Bristol Fire - Engine 4 - Total	\$5,709.8	(\$40.0)	\$5,669.8	\$271.3	20.9 Years
Parks and Recreation - Ski Lodge - Total	\$2,981.4	(\$90.0)	\$2,891.4	\$135.1	21.4 Years
Bristol Fire - Fire HQ - Total	\$6,161.1	(\$120.0)	\$6,041.1	\$256.0	23.6 Years
Water Pollution Control - Air Blower - Total	\$2,229.6	\$0.0	\$2,229.6	\$94.1	23.7 Years
Water Pollution Control - Headworks - Total	\$1,486.4	\$0.0	\$1,486.4	\$62.7	23.7 Years
Water Pollution Control - Pump House - Total	\$1,486.4	\$0.0	\$1,486.4	\$62.7	23.7 Years
Water Department - Garage - Total	\$6,570.8	(\$30.0)	\$6,540.8	\$195.2	33.5 Years
Water Pollution Control - Sludge Thickening	\$3,425.6	\$0.0	\$3,425.6	\$87.2	39.3 Years

Table 6.1-2 Ranking of Energy Savings Measures Summary – Lighting System Retrofits					
	Engineer's Opinion of Probable Cost	CL&P Rebate	Total Cost	Annual Fiscal Savings	Simple Payback
Building - Total					
Water Pollution Control - Drayla PS	833.8	(\$40.0)	\$793.8	\$21.3	37.3 Years
Water Pollution Control - Lufkin PS	208.4	(\$10.0)	\$198.4	\$3.7	53.0 Years
Water Pollution Control - Lake PS	208.4	(\$10.0)	\$198.4	\$3.5	56.5 Years
Water Pollution Control - Cherry Hill PS	\$416.9	(\$20.0)	\$396.9	\$6.9	57.7 Years
Water Pollution Control - Tyler PS	\$625.3	(\$30.0)	\$595.3	\$10.2	58.2 Years
Water Pollution Control - Middle PS	\$625.3	(\$30.0)	\$595.3	\$10.2	58.2 Years
Water Pollution Control - Cross PS	\$833.8	(\$40.0)	\$793.8	\$13.6	58.5 Years
Water Pollution Control - East Main PS	\$208.4	(\$10.0)	\$198.4	\$3.4	58.5 Years
Water Pollution Control - Matthews PS	\$625.3	(\$30.0)	\$595.3	\$10.2	58.5 Years
Water Pollution Control - Minor PS	\$625.3	(\$30.0)	\$595.3	\$10.1	58.7 Years
Water Pollution Control - Boivin PS	\$416.9	(\$20.0)	\$396.9	\$6.8	58.7 Years
Water Pollution Control - Ivy PS	\$208.4	(\$10.0)	\$198.4	\$3.4	58.7 Years
Water Pollution Control - Broad Street PS	\$416.9	(\$20.0)	\$396.9	\$6.7	58.9 Years
Water Pollution Control - Julia PS	\$208.4	(\$10.0)	\$198.4	\$3.4	58.9 Years

6.1.3 HVAC Systems

Table 6.1-3 includes the recommended ECRM to provide energy savings for building HVAC systems, which provide a simple payback of less than 20 years. A detailed discussion on building HVAC systems is presented in Section 4.3.

Table 6.1-3 Ranking of Energy Savings Measures Summary – HVAC System Upgrade					
Building Measure	Retrofit Cost	Incentives	Total Cost	Annual Fiscal Savings	Simple Payback (Years)
Fire Department Pipe Insulation	\$1,150	\$0	\$1,150	\$1,201	1.0
Police Court NARC Air Handler	\$15,041	\$0	\$15,041	\$5,451	2.8
WPCP Headworks Preheat	\$25,078	\$0	\$25,078	\$2,469	10.2
Senior Center Condensing Boiler	\$134,479	\$0	\$134,479	\$12,526	10.7
Senior Center DDC Controls	\$68,245	\$0	\$68,245	\$5,867	11.6
WPCP Headworks Heat pump	\$109,336	\$6,000	\$103,336	\$8,061	12.8

Table 6.1-3 Ranking of Energy Savings Measures Summary – HVAC System Upgrade					
Building Measure	Retrofit Cost	Incentives	Total Cost	Annual Fiscal Savings	Simple Payback (Years)
Muzzy Field Generator	\$160,106	\$0	\$160,106	\$12,425	12.9
Recreation Building Condensing Unit Heater	\$8,418	\$0	\$8,418	\$605	13.9
City Hall CRAC Upgrade	\$55,452	\$0	\$55,452	\$3,759	14.7
Public Library Condensing Boiler	\$70,347	\$0	\$70,347	\$4,487	15.7
Water Filtration Plant Condensing Boiler	\$107,370	\$0	\$107,370	\$6,755	15.9
City Hall Annex Furnace Upgrade	\$8,418	\$0	\$8,418	\$463	18.2
City Hall Pipe Insulation Improvements	\$497	\$0	\$497	\$26	19.1
City Hall Building Control System Upgrade	\$142,588	\$0	\$142,588	\$6,831	20.9
Fire Department Engine 3 Condensing Boiler	\$45,846	\$0	\$45,846	\$2,079	22.1
Fire Department Fire Headquarters Condensing Boiler	\$107,370	\$0	\$107,370	\$3,504	30.6
Fire Department DDC Controls	\$93,567	\$0	\$93,567	\$2,699	34.7
Youth Services DDC Control	\$18,713	\$0	\$18,713	\$511	36.6
City Hall Chiller Replacement	\$212,756	\$0	\$212,756	\$2,175	97.8
Public Library Chiller Replacement	\$69,846	\$0	\$69,846	\$483	114.6
Water Filtration Plant Chiller Replacement	\$194,068	\$0	\$194,068	\$1,609	120.6

6.1.4 Solar Energy

Implementation of new solar energy systems has been evaluated to determine the economic feasibility for furnishing and installing such systems. Based on the simple payback modeling performed, it would not benefit the City to further investigate installing the solar energy systems. This is primarily based on the initial upfront capital investment required for a solar energy system installation and an acceptable payback period. Table 6.1-4, includes a ranking of the solar energy ECRMs evaluated for the City.

Table 6.1-4
Ranking of Energy Savings Measures Summary – Solar Energy Systems

Department	Location	Retrofit Cost	Energy Savings	RECs	Simple Payback
WPCP	East Main Pump Station	\$200,937.5	\$9,913.0	\$195.2	20.2
Public Works	City Yard	\$1,659,950.0	\$31,027.4	\$3,945.5	47.5
Senior Center	Senior Center	\$3,733,820.0	\$71,944.3	\$9,276.3	50.6
Fire	Fire HQ	\$659,015.0	\$9,611.4	\$1,372.7	60.0
City Hall	City Hall	\$1,178,855.0	\$19,085.1	\$2,708.9	60.1
WPCP	Plant	\$21,330,012.5	\$335,662.8	\$54,506.3	61.5
Water Dept	Water Filtration Plant	\$4,114,137.5	\$64,188.6	\$10,253.8	62.1
Fire	Engine 5	\$396,687.5	\$5,539.0	\$698.4	63.6
Parks	Rockwell Park	\$237,500.0	\$3,595.6	\$289.2	65.0
City Hall	City Hall Annex	\$378,125.0	\$4,928.8	\$650.6	67.7
Fire	Engine 4	\$406,295.0	\$5,480.2	\$723.1	72.2
WPCP	Broad St Pump Station	\$449,000.0	\$6,034.4	\$832.8	72.4
Fire	Engine 2	\$383,255.0	\$452.4	\$663.8	73.8
Fire	Engine 3	\$307,070.0	\$3,783.6	\$468.0	79.2
Library	Main Library	\$352,126.3	\$4,070.4	\$583.8	84.1
Public Works	Animal Control	\$287,000.0	\$3,049.8	\$416.4	91.6
Water Dept	Water Department Main Office & Garage	\$1,025,000.0	\$6,197.9	\$1,388.0	158.3
WPCP	Cherry Hill Pump Station	\$150,312.5	\$452.4	\$65.1	289.4
WPCP	Cross Pump Station	\$150,312.5	\$452.4	\$65.1	289.4
WPCP	Drayla Pump Station	\$150,312.5	\$452.4	\$65.1	289.4
WPCP	Ivy Pump Station	\$150,312.5	\$452.4	\$65.1	289.4
WPCP	Julia Pump Station	\$150,312.5	\$452.4	\$65.1	289.4
WPCP	Lake Pump Station	\$150,312.5	\$452.4	\$65.1	289.4
WPCP	Lufkin Pump Station	\$150,312.5	\$452.4	\$65.1	289.4
WPCP	Matthews Pump Station	\$150,312.5	\$452.4	\$65.1	289.4
WPCP	Middle Pump Station	\$150,312.5	\$452.4	\$65.1	289.4
WPCP	Minor Pump Station	\$150,312.5	\$452.4	\$65.1	289.4
WPCP	Boivin Pump Station	\$150,312.5	\$452.4	\$65.1	289.4
WPCP	Tyler Pump Station	\$150,312.5	\$452.4	\$65.1	289.4

6.1.5 Wind Energy

Implementation of new wind energy systems has been evaluated to determine the economic feasibility for furnishing and installing such systems. Based on the simple payback modeling performed, it would not benefit the City to further investigate installing the wind energy systems. This is primarily based on the initial upfront capital investment required for a wind energy system installation and a payback period greater than 20 years. Table 6.1-5, includes a ranking of the wind energy ECRMs evaluated for the City.

Table 6.1-5: Ranking of Energy Savings Measures Summary – Wind Turbine Energy System			
Parameter	Wind Turbine (Minimum Site Wind Speed – 4.2 m/s)	Wind Turbine (Maximum Site Wind Speed – 5.2 m/s)	Wind Turbine (Average Site Wind Speed –4.6 m/s)
Engineer's Opinion of Probable Cost	\$71,995	\$71,995	\$71,995
1 st Year Production	5,437 kWh	9,756 kWh	7,249 kWh
Annual Estimated Electric Savings	\$1,582.2	\$2,839	\$2,110
Annual Estimated REC Revenue	\$136	\$244	\$181
Project Simple Payback	42 Years	23 Years	31 Years

6.1.6 Motor Upgrades and VFD Additions

Table 6.1-6 includes the recommended ECRM to provide energy savings by upgrading motors to premium efficiency models, and adding VFDs. A detailed discussion on motor upgrades and VFD additions is presented in Section 4.4.

Table 6.1-6 Ranking of Energy Savings Measures Summary – Motor Upgrades and VFD Additions					
Building & Measure	Engineer's Opinion of Probable Cost	Incentives	Total Cost	Annual Fiscal Savings	Simple Payback (Years)
WTP - Pump Station and Well Houses	\$84,540	(\$3,010.00)	\$82,199	\$7,624	10.8
Water Pollution Control Plant (WPCP)	\$243,924	(\$5,500.00)	\$238,423	\$21,697	11
WPCP - Pump Stations	\$84,540	(\$2,340.00)	\$298,093	\$20,470	14.6
WTP - High Service Pump Station	\$32,850	(\$1,040.00)	\$31,810	1,249	25.5

6.1.7 Building Envelope Recommendations and Improvements

Table 6.1-7 includes the recommended ECRM to provide energy savings by upgrading or replacing particular building components, such as windows, doors, walls, roof, etc. A detailed discussion on building envelope recommendations and improvements is presented in Section 4.7.

Table 6.1-7 Ranking of Energy Savings Measures Summary – Building Envelope Improvements					
Building & Measure	Engineer's Opinion of Probable Cost	Incentives	Total Cost	Annual Fiscal Savings	Simple Payback (Years)
Youth Services Main Building Batt Insul. Installation	\$8,050	0	\$8,050	\$242	26
Mancross Public Library Wall Improvements and Roof Replacement	\$317,688	0	\$317,688	\$7,236	31
Water Pollution Control – Admin Bldg HM Door Replacement	\$1750	0	\$1750	NA	NA
Fire Engine Co. No. 3 thru 5 Window Replacement	\$19,838	0	\$19,838	NA	NA
Fire Engine Co. No. 2 Window Replacement	\$23,288	0	\$23,288	NA	NA
Fire Headquarters Window Replacement	\$103,500	0	\$103,500	NA	NA
Police Court Window Replacement	\$129,375	0	\$129,375	\$99	NA
City Hall Window Replacement w/ Insul. Spandrel Panel	\$407,351	0	\$407,351	\$386	NA
City Hall Window Replacement	\$698,625	0	\$698,625	\$279	NA

Section 7

Available Grants, Incentives and Funding Sources

7.1 Energy Efficiency

The Connecticut Energy Efficiency Fund (CEEF) was created as part of the electric-industry restructuring legislation enacted in April 1998. The CEEF's mission is to advance the efficient use of energy, reduce air pollution and negative environmental impacts and promote economic development and energy security. The CEEF is funded through a \$0.003 per kWh charge on Connecticut Light and Power and United Illuminating customers' electric bills. Energy efficiency programs are administered and implemented by the electric company with monies from the fund. All programs listed below, with the exception of ESCOs, are funded by the CEEF.

7.1.1 Commercial Energy Efficiency Rebates (CL&P)

Connecticut Light and Power (CL&P) offers rebates to its commercial and industrial customers for the purchase of energy efficient equipment. Lighting, motors and heating/cooling equipment can be replaced or retrofitted to provide lower energy consumption. These rebates are a fixed amount and calculated on a per unit basis. Below are approximate rebate amounts:

- Premium Efficient Motors: \$45 - \$700; varies by hp and motor efficiency
- Unitary/Split System HVAC Equipment: \$50 - \$120/ton
- Water Source Heat Pump Equipment: \$150/ton
- HVAC Controls: \$250/unit
- VFDs for HVAC applications: \$920 - \$9,290; varies by hp and type
- Lighting: Up to 50% of the cost of T-12 fixtures

Rebates are limited and available on a first-come, first-serve basis. They are paid directly to the customer after the installation of pre-designated measures using a qualified, licensed contractor. Applications are available on the CL&P website or by calling 1-877-WISE-USE.

7.1.2 Energy Conscious Blueprint Rebate Program (CL&P)

These rebates from CL&P are available for non-residential new construction, major renovations, the purchase of new equipment or the replacement of existing equipment near the end of its useful life. The following are types of equipment that are eligible for these rebates:

- Energy efficient lighting
- HVAC systems
- Building envelopes (cool roofs, windows)
- Refrigeration
- Water heating equipment
- Process equipment

CL&P customers on a commercial or industrial rate can participate. Energy experts from the utility will work with the design team to identify ECMs, but the City maintains control of the project. Rebate amounts are calculated based on the cost difference between traditional and energy efficient equipment.

7.1.3 Energy Opportunities Program (CL&P)

The Energy Opportunities Program addresses the retrofitting of existing buildings with energy efficient equipment. A retrofit is defined as the replacement of existing equipment that is operational and has at least 25% of its useful life remaining. The following equipment is eligible for financial incentives under this program:

- Lighting
- HVAC systems
- Refrigeration
- Water heating equipment
- Process-related equipment

Customers of CL&P on a commercial or industrial rate are eligible to participate. Energy experts from the utility work with the design team to identify energy-saving equipment replacements. Financial incentives, which may include zero-percent or low-interest rate loans, are determined on a case-by-case basis.

The new Comprehensive Initiative under the Energy Opportunities Program offers customers up to \$300,000 per electric meter per year and up \$750,000 per Federal Tax ID per year. Projects are eligible for the Comprehensive Initiative if they include at least two electric end-uses (i.e. lighting, HVAC systems, process-related equipment, etc), 15 percent or more non-lighting end-uses and reduce summer peak kWh and kW consumption. Incentives are based on the lesser of:

- 50% of installed cost;
- buy-down of the project to a 2-year payback (based on electricity savings); or
- avoided annual energy cost – up to \$0.50 per annual kWh and \$700.00 per summer peak kW

7.1.4 Operation and Maintenance Program (CL&P)

The O&M Program allows customers to improve their electrical and thermal efficiency through changes and repairs to existing systems. The program provides technical and financial assistance to improve your facility's overall performance based on advanced operation and maintenance practices and technology. Customers of CL&P on commercial or industrial rates are eligible.

The program provides energy experts from the utility that work with your design professional, contractor or facilities group to identify O&M improvements, review your proposal and quantify the potential savings. Energy efficient measures may be eligible for incentives to offset a portion of the installed project cost. When applicable, operator training may be provided to help maintain the energy efficiency improvements. Examples of common O&M project can be found at the CL&P website.

7.1.5 Municipal Loan Program (CL&P)

The Municipal Loan Program is designed to be used in combination with other qualifying incentive programs offered by CL&P. Municipal customers may be eligible for interest-free loans to recover the cost of energy-efficiency projects not covered by other incentive programs. The customer must be in good credit standing and loans are not available for customers or projects that qualify for CL&P's Energy Conscious Blueprint Program. The loan must be used for the replacement of existing electrical equipment with high-efficiency electrical equipment. Loan amounts can range from \$500 to \$100,000 and a maximum loan term of 48 months. Loan re-payments are administered through on-bill financing.

7.1.6 Performance Based Contracts (ESCOs)

A financing alternative for an energy efficiency project would be to enter into a Performance Based Contract with an Energy Services Company (ESCO). The premise of this type of contract is that it requires no initial municipal capital contributions in order to implement the project - instead relying on future operations cost savings and/or energy production, to fund the annual payments. Prior to entering into an agreement for the funding of the project, an ESCO would perform an energy audit and/or conceptual studies to confirm future energy cost savings or energy production inherent with the projects implementation and operation. The contract would then be formulated based on some measurable parameter(s) (sludge reduction, energy production, etc) which would be verified by measurement throughout the contract duration. The savings in energy costs or energy production would then be used to pay back the capital investment of the project over the contract time period (typically

on the order of 10-years or less). The ESCO would guarantee the agreed upon energy savings or energy production. If the project does not meet energy savings or production commitments, the ESCO pays the owner the equivalent difference.

7.1.7 Connecticut Energy Efficiency Incentive Program (Ameresco and DPUC)

This program, managed by Ameresco and funded by the Connecticut Department of Public Utility Control, was created to reduce peak electricity consumption by 5 MW in Connecticut and is funded through the Federally Mandated Congestion Charge on utility bills. Electric equipment covered under this program are lighting and lighting controls, motors, air compressors, refrigeration, manufacturing processes, whole building systems, or other equipment that uses electricity during peak hours. In order to be eligible for this rebate, equipment must be running from 1pm to 5pm during June, July and August and 5pm to 7pm during December and January. The facility in which the equipment is located can either be new or existing but must be in Connecticut and an electric customer. This program has no incentive caps and can provide rebates up to 100% of the project cost (based on peak hour energy savings). Rebates vary by project but are available up to \$1000/kW.

Funding is allocated on a first-come, first-serve basis. However, Ameresco expects funding to be available until June 2011. All projects must be pre-approved by Ameresco. The contact for this program is Larry Kata at 1-866-314-9611 or lkata@ameresco.com

7.2 Renewable Energy

7.2.1 Introduction

The Connecticut Clean Energy Fund (CCEF) was created under the same legislation as the CEEF. The CCEF is funded by a \$0.001 per kWh charge on customers' electric bills and is administered by Connecticut Innovations. The CCEF is authorized to invest in solar-electric energy, solar-thermal energy, wind energy, ocean-thermal energy, wave or tidal energy, fuel cells, landfill gas, hydrogen production and hydrogen conversion technologies, low-impact hydropower, low-emission advanced biomass conversion technologies, alternative fuels produced in Connecticut and used for electricity generation (including ethanol and biodiesel), usable electricity from combined heat and power (CHP) systems with waste-heat recovery systems, thermal storage systems, geothermal, and "other energy resources and emerging technologies which have significant potential for commercialization and which do not involve the combustion of coal, petroleum or petroleum products, municipal solid waste or nuclear fission."

The Connecticut Department of Public Utility Control (DPUC) regulates to varying degrees the rates and services of Connecticut's investor-owned electricity and natural gas companies. In the industries that are still wholly regulated, the Department must balance the public's right to safe adequate and reliable utility service at reasonable rates with the provider's right to a reasonable return on its investment.

7.2.2 CCEF-ARRA Commercial Solar PV Program

The Connecticut Clean Energy Fund launched the Commercial Solar Photovoltaic (PV) program in October 2010 using funding from the American Recovery and Reinvestment Act (ARRA). This program is available to commercial, industrial, non-profit organizations, municipal, state, local, and federal entities for PV installations. A maximum grant of \$1 million is available and the program has a total budget of \$3 million. The program will continue until April 2012 or until funding is exhausted.

Solar PV projects must be at least 50 kW in size but no more than 200 kW and must be designed for on-site use. Projects must use commercially available PV technology, be relatively far along in the permitting process, have (or be close to having) site control, be ready for installation. Projects requiring minimal investment from CCEF will be selected over those that require more significant investments. In addition, an energy audit is required for the site of the proposed PV project (or evidence that an energy audit was completed on the site at least within 3 years prior to submitting the application) and all recommendations made within the audit that have payback periods of five years or less must have been implemented. Projects with third-party power purchase agreements are eligible. There are additional ARRA-related requirements (i.e. historical preservation review, requirements that prevailing wages be paid, as well as certain "buy American" provisions if the site is a public building).

7.2.3 On-site Renewable Distributed Generation Program (CCEF)

This program funds the installation of on-site renewable energy. The renewable energy technologies eligible for this program are photovoltaic, landfill gas, wind, biomass, fuel cells, small hydroelectric, tidal energy, wave energy and ocean thermal; however, the program is not currently accepting applications for photovoltaic projects. Renewable energy devices must be larger than 10 kW, have a warranty and spare parts and service commensurate with commercial status. The level of support varies depending on the specific technology, efficiency and economics of the installation. The Request for Proposals for the current round was issued on November 1, 2010. Interested applicants must attend an informational meeting at CCEF's Rocky Hill Offices on December 6, 2010 and applications are due by February 28, 2011. There is \$5,780,000 available under the current RFP (due Feb 28, 2010), and a total of \$12.86 M through June 30, 2012.

Projects must be utilizing commercially available technologies (no prototypes). Projects should be in development phase (not construction phase) and should have made progress in permitting as well as site control (most likely through ownership). Projects owned by third-parties are eligible. Projects that incorporate an educational component (such as disseminating lessons learned or how to overcome obstacles or what the benefits of the clean energy project are) will be preferred. Only projects developed for on-site use are eligible (net metered systems are allowed for occasional exports, but the grant will be reduced if the system is oversized and significant excess energy is expected). Projects must be located in Connecticut and must be located in

Connecticut Light and Power (CL&P) or United Illuminating (UI) service territories. Projects that require minimal support from this grant will be given priority.

7.2.4 Low-Interest Loans for Customer-Side Distributed Resources (DPUC)

This program offers loans for electric customers installing customer-owned electric generating equipment. Facilities that plan to utilize renewable energies are eligible for incentive grants, but may receive higher incentives through CCEF. Distributed resource projects that use natural gas may qualify for reduced rates from Yankee Gas. Projects must have greater than 50 kW and less than 65 MW capacity. Projects larger than 1 MW and all fuel cell projects require the approval of the Connecticut Siting Council.

7.2.5 Net Metering

CL&P is required to provide net metering services to customers who generate electricity using "Class I" renewable energy resources. Class I renewable energy technologies include solar, wind, landfill gas, fuel cells, sustainable biomass, ocean thermal power, wave or tidal power, low-emission advanced renewable energy conversion technologies and hydropower facilities. Individual systems must have a capacity under 2 MW, but there is no limit on the aggregate capacity net-metered systems. Any net excess generation is credited to the customer's next bill at retail rate and excess is reconciled annually. Under this program, customers retain owners of the renewable energy credits (RECs).

7.2.5.1 Interconnection Requirements

DPUC has established interconnection guidelines for distributed energy systems up to 20 MW. Three levels of systems have been addressed which are: (1) certified, inverter-based systems under 10 kW, (2) certified systems under 2 MW, and (3) all other systems under 20 MW. The guidelines include a standard interconnection agreement and application fee that varies by system type. Connecticut guidelines are stricter than FERC's standards and differ in several significant ways. Below is an incomplete list of differences between DPUC and FERC guidelines.

- Installation of an external disconnect switch and an interconnection transformer
- Indemnification of their utility against "all causes of action," including personal injury or property damage to third parties
- Required to maintain liability insurance in specified amounts based on the system's capacity

7.2.6 Renewable Energy Credits

Connecticut's Renewable Portfolio Standards (RPS) requires each electric supplier and each electric distribution company wholesale supplier to obtain at least 20% of its retail load by using Class I renewable energy by January 1, 2020. Electric suppliers

may satisfy RPS requirements by purchasing RECs from electricity generated using Class I resources within the jurisdiction of the regional independent system operator. The RPS, and creation of RECs, is intended to provide additional revenue flow and financial support for renewable energy projects in Connecticut. [Class I RECs include electricity generation from solar, wind, wave, tidal, landfill/anaerobic digestion gas, ocean thermal, low-emission advanced renewable energy conversion technologies, certain hydropower facilities and sustainable biomass.] Over the past year, RECs have traded between \$25-30 per MWh for electricity generated from Class I sources. Electric providers that fail to comply with the RPS during an annual period must pay \$55 per MWh to the DPUC to fund the CCEF.

7.2.7 Clean Renewable Energy Bonds (IRS)

CREBs are 0% interest bonds typically issued for up to approximately \$3.0 million administered by the Internal Revenue Service (IRS). In 2009, \$2.2 billion in CREBs was allocated to municipal entities to fund 610 renewable energy projects, including anaerobic digestion. IRS has been allocating funding for CREBs annually since 2005. Last year, IRS solicited applications starting in April, which were due in August. The IRS is expected to receive additional funding for CREBs and release another round of solicitations in 2010 or 2011.

7.2.8 Qualified Energy Conservation Bonds (IRS)

These IRS 0% interest bonds are very similar to CREBs except they are allocated based on state and county population. QECBs are typically distributed through municipal bond banks or state economic development agencies.

7.2.9 Global Climate Change Mitigation Incentive Fund (US EDA)

The Economic Development Agency (part of the U.S. Department of Commerce) administers the GCCMIF to public works projects that reduce greenhouse gas emissions and creates new jobs. Nationwide, \$290 million was allocated to the fund, and the Northeast region of EDA has been allocated \$30 million. Applications are due on a rolling basis. The program does not have a maximum grant amount but does limit the grant to 50 percent of the project cost.

7.2.10 Private Tax-Exempt Financing

Similar to traditional municipal bond financing, there are many private financial service companies that offer a myriad of options for tax-exempt financing of municipal projects. The providers of these services suggest that this capital can be offered at competitive rates in an expedited timeframe and with fewer complications when compared to traditional municipal financing methods. Though these factors would need to be compared on a case-by-case basis, the one distinct advantage to private financing on the current project would likely be the flexibility to structure payments to meet budget needs with consideration given to the terms and conditions of existing loan and/or bond agreements. For example, this mechanism could be used to limit the energy project debt payments in the initial years when the current bond

debt is the greatest and the operations savings of the project has yet to be fully realized. It should also be noted that, in many cases, the construction and long term financing can be rolled into a single private financing agreement.

7.2.11 Power Purchase Agreements (SPCs)

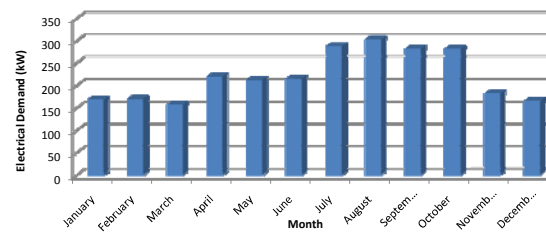
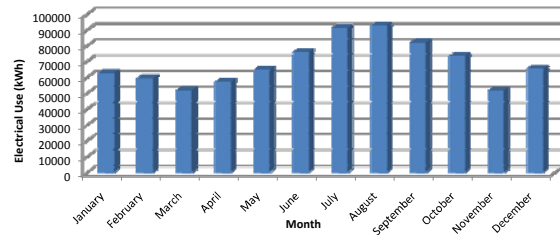
More commonly referred to as a Build-Own-Transfer (BOT) agreement in the Water/Wastewater industry, a Power Purchase Agreement (PPA) also delivers a project with no initial capital contribution by the original owner. In this model, a Special Purpose Company (SPC) created by a developer, would own the energy production facilities. Within the framework of a PPA, a SPC will typically lease property from the owners for construction and operation of the new facilities. The funding and construction of the new facilities would be performed by the SPC who would then own and operate the facilities for the duration of the contract (typically 20 to 30 years). Throughout that period of time, the original owner would purchase power from the SPC at a pre-negotiated rate which would take into account the initial capital cost, operation and maintenance of the constructed facility, ancillary benefits of the project and investor returns on investment. For renewable energy, financial incentives may enable this financing approach to compete favorably with utility power tariffs. Incentives include state and local tax credits, renewable energy credits, and Federal energy production tax credits or energy investment tax credits.

APPENDIX A

UTILITY BILL INFORMATION

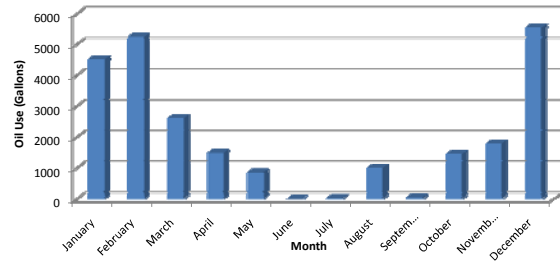
Electric Bills for Plots - City Hall								
Comments	Month	Year	CL & P Delivery Charges Ac # 51254653009	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
			Meter # 891607712					
Not Consecutive	March	2009	\$ 1,479.38	\$ -	\$ 1,479.38	23616	0.0	\$ 0.06
	April	2009	\$ 3,804.77	\$ -	\$ 3,804.77	57463	164.7	\$ 0.07
	May	2009	\$ 4,072.03	\$ -	\$ 4,072.03	57212	165.5	\$ 0.07
	June	2009	\$ 4,135.02	\$ -	\$ 4,135.02	66846	157.4	\$ 0.06
	July	2009	\$ 4,930.20	\$ -	\$ 4,930.20	88397	282.2	\$ 0.06
	August	2009	\$ 5,076.61	\$ -	\$ 5,076.61	92990	318.7	\$ 0.05
	September	2009	\$ 4,496.99	\$ -	\$ 4,496.99	82036	281.9	\$ 0.05
	October Estimated	2009	\$ 4,552.71	\$ -	\$ 4,552.71	73585	281.9	\$ 0.06
	November	2009	\$ 3,969.81	\$ -	\$ 3,969.81	51733	182.0	\$ 0.08
	Dec-Feb Estimated	2009	\$ 3,878.52	\$ -	\$ 3,878.52	65151	165.5	\$ 0.06
Dec-Feb Estimated	January	2010	\$ 3,853.14	\$ -	\$ 3,853.14	62505	169.3	\$ 0.06
	February	2010	\$ 3,433.73	\$ -	\$ 3,433.73	59328	170.1	\$ 0.06
	March	2010	\$ 4,127.40	\$ -	\$ 4,127.40	51846	158.2	\$ 0.08
	April	2010	\$ 4,516.56	\$ -	\$ 4,516.56	56689	274.6	\$ 0.08
	May	2010	\$ 4,979.75	\$ -	\$ 4,979.75	72077	260.0	\$ 0.07
	June	2010	\$ 5,028.51	\$ -	\$ 5,028.51	85193	274.2	\$ 0.06
	July	2010	\$ 5,364.70	\$ -	\$ 5,364.70	94440	292.6	\$ 0.06
	August	2010	\$ 5,246.36	\$ -	\$ 5,246.36	92556	288.4	\$ 0.06
	Not Consecutive	September	\$ 2,968.23	\$ -	\$ 2,968.23	43520	274.2	\$ 0.07

Month	Combined (KWH)	Demand (KW)
January	62505	169
February	59328	170
March	51846	158
April	57076	220
May	64645	213
June	76020	216
July	91419	287
August	92773	304
September	82036	282
October	73585	282
November	51733	182
December	65151	166
Total	828117	



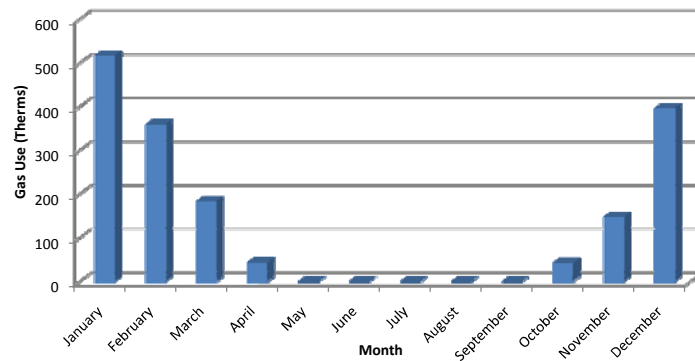
Oil Bills for Plots - City Hall							
Comments	Month	Year	Buckley Delivery Charges Ac. #	0 Supply Charges Ac. #	Total Oil Charges	Total Gallons	Cost Per Gallon
			1905-003 Meter # 891607712				
	January	2007	\$ -	\$ -	\$ -	227	\$ -
	February	2007	\$ -	\$ -	\$ -	6,360	\$ -
	March	2007	\$ -	\$ -	\$ -	3,034	\$ -
	April	2007	\$ -	\$ -	\$ -	1,967	\$ -
	May	2007	\$ -	\$ -	\$ -	3,282	\$ -
	June	2007	\$ -	\$ -	\$ -	0	\$ -
	July	2007	\$ -	\$ -	\$ -	100	\$ -
	August	2007	\$ -	\$ -	\$ -	3,009	\$ -
	September	2007	\$ -	\$ -	\$ -	0	\$ -
	October	2007	\$ -	\$ -	\$ -	123	\$ -
	November	2007	\$ -	\$ -	\$ -	3,816	\$ -
	December	2007	\$ -	\$ -	\$ -	7,857	\$ -
	January	2008	\$ -	\$ -	\$ -	8,204	\$ -
	February	2008	\$ -	\$ -	\$ -	4,795	\$ -
	March	2008	\$ -	\$ -	\$ -	2,013	\$ -
	April	2008	\$ -	\$ -	\$ -	2,514	\$ -
	May	2008	\$ -	\$ -	\$ -	0	\$ -
	June	2008	\$ -	\$ -	\$ -	0	\$ -
	July	2008	\$ -	\$ -	\$ -	0	\$ -
	August	2008	\$ -	\$ -	\$ -	0	\$ -
	September	2008	\$ -	\$ -	\$ -	139	\$ -
	October	2008	\$ -	\$ -	\$ -	4,175	\$ -
	November	2008	\$ -	\$ -	\$ -	195	\$ -
	December	2008	\$ -	\$ -	\$ -	6,018	\$ -
	January	2009	\$ -	\$ -	\$ -	5,088	\$ -
	February	2009	\$ -	\$ -	\$ -	4,016	\$ -
	March	2009	\$ -	\$ -	\$ -	3,875	\$ -
	April	2009	\$ -	\$ -	\$ -	0	\$ -
	May	2009	\$ -	\$ -	\$ -	103	\$ -
	June	2009	\$ -	\$ -	\$ -	2,997	\$ -
	July	2009	\$ -	\$ -	\$ -	0	\$ -
	August	2009	\$ -	\$ -	\$ -	0	\$ -
	September	2009	\$ -	\$ -	\$ -	0	\$ -
	October	2009	\$ -	\$ -	\$ -	44	\$ -
	November	2009	\$ -	\$ -	\$ -	1,356	\$ -
	December	2009	\$ -	\$ -	\$ -	2,764	\$ -
	January	2010	\$ -	\$ -	\$ -	4,556	\$ -
	February	2010	\$ -	\$ -	\$ -	5,836	\$ -
	March	2010	\$ -	\$ -	\$ -	1,566	\$ -
	April	2010	\$ -	\$ -	\$ -	1,452	\$ -
	May	2010	\$ -	\$ -	\$ -	73	\$ -

Month	Combined (Gallons)
January	4519
February	5252
March	2622
April	1483
May	864
June	#REF!
July	33
August	1003
September	46
October	1447
November	1789
December	5546
Total	#REF!



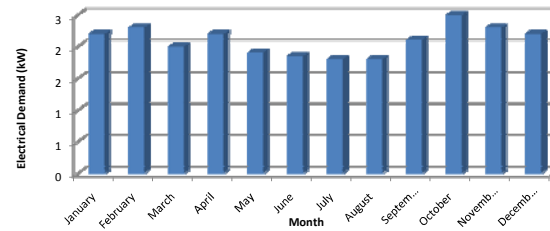
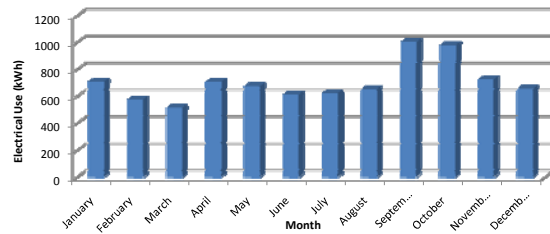
Gas Bills for Plots - City Hall							
Comments	Month	Year	Yankee Gas	Hess	Total Gas Charges	Total Therms	Cost Per Therm
			Delivery Charges Ac. # 264-230-0380000447917 Meter # 891607712	Supply Charges Ac. # 450344/468345			
Not Consecutive	July	2008	\$ 22.77	\$ 27.74	\$ 50.51	15	\$ 3.45
	August	2008	\$ 70.28	\$ 85.05	\$ 155.34	45	\$ 3.44
	September	2008	\$ 65.06	\$ 79.12	\$ 144.19	42	\$ 3.45
	October	2008	\$ 111.40	\$ 99.89	\$ 211.29	72	\$ 2.95
	November	2008	\$ 272.69	\$ 167.75	\$ 440.43	181	\$ 2.44
	December	2008	\$ 516.49	\$ 266.19	\$ 782.69	352	\$ 2.22
	January	2009	\$ 650.59	\$ 308.28	\$ 958.87	451	\$ 2.13
	February	2009	\$ 567.79	\$ 277.35	\$ 845.13	393	\$ 2.15
	March	2009	\$ 327.48	\$ 204.85	\$ 532.32	227	\$ 2.35
	April	2009	\$ 97.17	\$ 100.01	\$ 197.18	67	\$ 2.93
	May	2009	\$ -	\$ 61.71	\$ 61.71	-	
	June	2009	\$ -	\$ 67.97	\$ 67.97	-	
	July	2009	\$ -	\$ 66.53	\$ 66.53	-	
	August	2009	\$ -	\$ 77.61	\$ 77.61	-	
	September	2009	\$ -	\$ 67.08	\$ 67.08	-	
	October	2009	\$ 16.05	\$ 76.55	\$ 92.61	13	\$ 7.28
	November	2009	\$ 144.45	\$ 134.13	\$ 278.58	115	\$ 2.43
	December	2009	\$ 555.40	\$ 265.04	\$ 820.44	440	\$ 1.86
	January	2010	\$ 736.48	\$ 314.26	\$ 1,050.74	584	\$ 1.80
	February	2010	\$ 410.24	\$ 226.67	\$ 636.91	325	\$ 1.96
	March	2010	\$ 177.87	\$ 154.70	\$ 332.57	141	\$ 2.36
	April	2010	\$ 24.76	\$ 81.71	\$ 106.47	20	\$ 5.43
	May	2010	\$ 0.84	\$ 79.45	\$ 80.29	1	\$ 121.84
	June	2010	\$ -	\$ 71.49	\$ 71.49	-	
	July	2010	\$ -	\$ 73.02	\$ 73.02	-	
	August	2010	\$ -	\$ 44.09	\$ 44.09	-	#VALUE!
Not Consecutive							

Month	Combined (Therms)
January	517
February	359
March	184
April	43
May	0
June	0
July	0
August	0
September	0
October	42
November	148
December	396
Total	1690



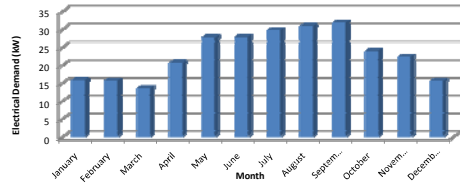
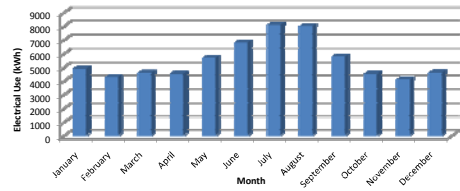
Electric Bills for Plots - City Hall Annex								
			CL & P Delivery Charges Ac # 51611983040 Meter # 891029692	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 38.48	\$ -	\$ 38.48	496	0.0	\$ 0.08
	April	2009	\$ 75.52	\$ -	\$ 75.52	984	3.0	\$ 0.08
June-July Estimated	May	2009	\$ 76.06	\$ -	\$ 76.06	1002	2.6	\$ 0.08
	June	2009	\$ 70.18	\$ -	\$ 70.18	954	2.5	\$ 0.08
	July	2009	\$ 68.43	\$ -	\$ 68.43	989	2.4	\$ 0.08
	August	2009	\$ 70.78	\$ -	\$ 70.78	1015	2.4	\$ 0.08
	September	2009	\$ 70.66	\$ -	\$ 70.66	1006	2.1	\$ 0.08
	October	2009	\$ 68.89	\$ -	\$ 68.89	977	2.5	\$ 0.08
Dec-Jan Estimated	November	2009	\$ 59.40	\$ -	\$ 59.40	726	2.3	\$ 0.08
	December	2009	\$ 57.85	\$ -	\$ 57.85	657	2.2	\$ 0.08
June-July Estimated	January	2010	\$ 60.70	\$ -	\$ 60.70	710	2.2	\$ 0.08
	February	2010	\$ 56.35	\$ -	\$ 56.35	576	2.3	\$ 0.11
	March	2010	\$ 54.34	\$ -	\$ 54.34	514	2.0	\$ 0.11
	April	2010	\$ 49.71	\$ -	\$ 49.71	425	1.4	\$ 0.11
	May	2010	\$ 51.76	\$ -	\$ 51.76	347	1.2	\$ 0.11
	June	2010	\$ 45.58	\$ -	\$ 45.58	275	1.2	\$ 0.11
	July	2010	\$ 45.85	\$ -	\$ 45.85	260	1.2	\$ 0.11
	August	2010	\$ 48.25	\$ -	\$ 48.25	292	1.2	\$ 0.11
	Not Consecutive	September	2010	\$ 26.84	\$ -	\$ 26.84	173	1.2

Month	Combined (KWH)	Demand (KW)
January	710	2
February	576	2
March	514	2
April	704	2
May	675	2
June	614	2
July	625	2
August	653	2
September	1006	2
October	977	3
November	726	2
December	657	2
Total	8437	



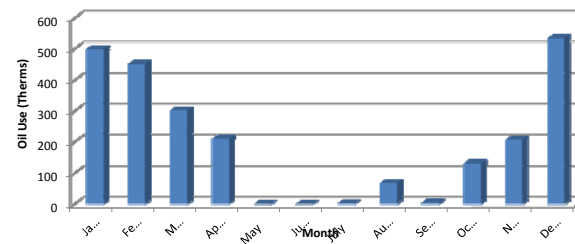
Electric Bills for Plots - Water Department Main Office & Garage								
			CL & P Delivery Charges Ac # 51881653075 Meter # 280129272	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive June-July Estimated	March	2009	\$ 136.76	\$ -	\$ 136.76	1840	9.6	\$ 0.02
	April	2009	\$ 357.09	\$ -	\$ 357.09	4169	14.4	\$ 0.09
	May	2009	\$ 454.65	\$ -	\$ 454.65	4823	26.5	\$ 0.09
	June	2009	\$ 440.07	\$ -	\$ 440.07	5286	24.1	\$ 0.08
	July	2009	\$ 504.48	\$ -	\$ 504.48	6486	25.4	\$ 0.08
	August	2009	\$ 587.30	\$ -	\$ 587.30	7212	30.0	\$ 0.08
	September	2009	\$ 504.37	\$ -	\$ 504.37	5749	31.8	\$ 0.09
	October	2009	\$ 415.03	\$ -	\$ 415.03	4500	23.8	\$ 0.09
	November	2009	\$ 343.03	\$ -	\$ 343.03	4087	22.2	\$ 0.08
	December	2009	\$ 319.99	\$ -	\$ 319.99	4589	15.6	\$ 0.07
	Dec-Jan Estimated							
January	2010	\$ 334.61	\$ -	\$ 334.61	4875	15.8	\$ 0.07	
February	2010	\$ 308.76	\$ -	\$ 308.76	4270	15.6	\$ 0.07	
March	2010	\$ 374.06	\$ -	\$ 374.06	4583	13.5	\$ 0.08	
April	2010	\$ 471.44	\$ -	\$ 471.44	4853	26.9	\$ 0.10	
May	2010	\$ 587.86	\$ -	\$ 587.86	6490	29.0	\$ 0.09	
June	2010	\$ 632.85	\$ -	\$ 632.85	8285	31.5	\$ 0.08	
July	2010	\$ 690.66	\$ -	\$ 690.66	9679	33.9	\$ 0.07	
August	2010	\$ 663.50	\$ -	\$ 663.50	8780	31.7	\$ 0.08	
Not Consecutive	September	2010	\$ 346.99	\$ -	\$ 346.99	4288	21.3	\$ 0.08

Month	Combined (KWH)	Demand (KW)
January	4875	16
February	4270	16
March	4583	14
April	4511	21
May	5656	28
June	6786	28
July	8082	30
August	7996	31
September	5749	32
October	4500	24
November	4087	22
December	4589	16
Total	65685	



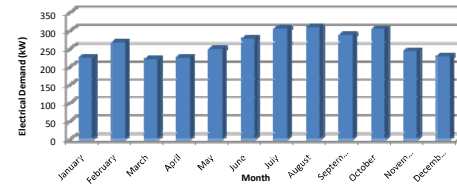
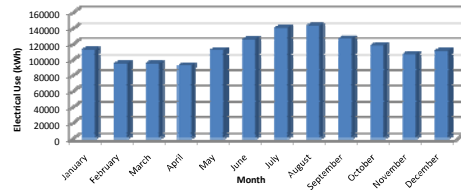
Oil Bills for Plots - Water Dept Office					
Comments	Month	Year	Buckley Delivery Charges Ac. # 1907-000/01 Meter # 0	Total Oil Charges	Total Therms
	January	2007	\$ -	\$ -	-
	February	2007	\$ -	\$ -	-
	March	2007	\$ -	\$ -	-
	April	2007	\$ -	\$ -	-
	May	2007	\$ -	\$ -	-
	June	2007	\$ -	\$ -	-
	July	2007	\$ -	\$ -	7
	August	2007	\$ -	\$ -	202
	September	2007	\$ -	\$ -	0
	October	2007	\$ -	\$ -	17
	November	2007	\$ -	\$ -	505
	December	2007	\$ -	\$ -	488
	January	2008	\$ -	\$ -	605
	February	2008	\$ -	\$ -	447
	March	2008	\$ -	\$ -	678
	April	2008	\$ -	\$ -	0
	May	2008	\$ -	\$ -	0
	June	2008	\$ -	\$ -	0
	July	2008	\$ -	\$ -	0
	August	2008	\$ -	\$ -	0
	September	2008	\$ -	\$ -	0
	October	2008	\$ -	\$ -	0
	November	2008	\$ -	\$ -	27
	December	2008	\$ -	\$ -	834
	January	2009	\$ -	\$ -	456
	February	2009	\$ -	\$ -	510
	March	2009	\$ -	\$ -	18
	April	2009	\$ -	\$ -	512
	May	2009	\$ -	\$ -	0
	June	2009	\$ -	\$ -	0
	July	2009	\$ -	\$ -	0
	August	2009	\$ -	\$ -	0
	September	2009	\$ -	\$ -	12
	October	2009	\$ -	\$ -	375
	November	2009	\$ -	\$ -	86
	December	2009	\$ -	\$ -	280
	January	2010	\$ -	\$ -	435
	February	2010	\$ -	\$ -	401
	March	2010	\$ -	\$ -	207
	April	2010	\$ -	\$ -	117
	May	2010	\$ -	\$ -	0
	June	2010	\$ -	\$ -	0
	July	2010	\$ -	\$ -	-
	August	2010	\$ -	\$ -	-
	September	2010	\$ -	\$ -	-
	October	2010	\$ -	\$ -	-
	November	2010	\$ -	\$ -	-
	December	2010	\$ -	\$ -	-

Month	Combined (Therms)
January	499
February	452
March	301
April	210
May	0
June	0
July	2
August	67
September	4
October	131
November	206
December	534
Total	2406



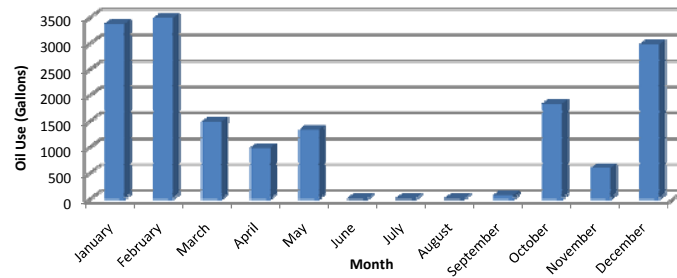
Electric Bills for Plots - Water Filtration Plant & High Service PS								
			CL & P Delivery Charges Ac # 51298493073 Meter # 890402712	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per KWh
Not Consecutive	March	2009	\$ -	\$ -	\$ 1,897.12	42324	94.0	\$ 0.04
	April	2009	\$ -	\$ -	\$ 4,298.81	95807	244.2	\$ 0.04
	May	2009	\$ -	\$ -	\$ 4,921.48	110959	239.2	\$ 0.04
	June	2009	\$ -	\$ -	\$ 4,739.18	117366	266.1	\$ 0.04
	July	2009	\$ -	\$ -	\$ 5,016.91	126757	263.0	\$ 0.04
	August	2009	\$ -	\$ -	\$ 5,314.87	134969	288.0	\$ 0.04
	September	2009	\$ -	\$ -	\$ 4,773.74	126498	286.8	\$ 0.04
	October	2009	\$ -	\$ -	\$ 4,873.50	117838	303.0	\$ 0.04
	November	2009	\$ -	\$ -	\$ 4,885.45	106614	243.1	\$ 0.05
	December	2009	\$ -	\$ -	\$ 4,617.19	110906	228.1	\$ 0.04
	Dec-Jan Estimated							
Not Consecutive	January	2010	\$ -	\$ -	\$ 4,808.20	112278	224.6	\$ 0.04
	February	2010	\$ -	\$ -	\$ 4,510.57	94943	267.3	\$ 0.05
	March	2010	\$ -	\$ -	\$ 4,643.60	95096	220.0	\$ 0.05
	April	2010	\$ -	\$ -	\$ 4,617.84	88740	206.2	\$ 0.05
	May	2010	\$ -	\$ -	\$ 5,369.87	112481	258.0	\$ 0.05
	June	2010	\$ -	\$ -	\$ 5,654.95	133659	286.8	\$ 0.04
	July	2010	\$ -	\$ -	\$ 6,520.27	153741	347.5	\$ 0.04
	August	2010	\$ -	\$ -	\$ 6,329.98	150272	330.6	\$ 0.04
	September	2010	\$ -	\$ -	\$ 3,423.82	80612	290.3	\$ 0.04

Month	Combined (KWH)	Demand (KW)
January	112278	225
February	94943	267
March	95096	220
April	92273	225
May	111720	249
June	125512	276
July	140249	305
August	142620	309
September	126498	287
October	117838	303
November	106614	243
December	110906	228
Total	1376547	



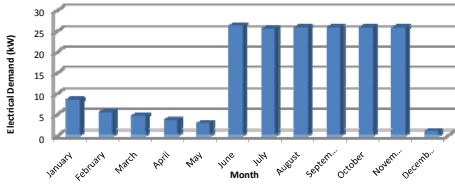
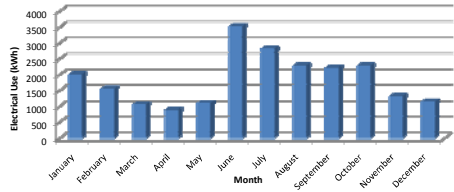
Oil Bills for Plots - Water Filtration Plant					
Comments	Month	Year	Buckley Delivery Charges Ac. # 1907-002 Meter # 0	Total Oil Charges	Total Gallons
	July	2007	\$ -	\$ -	0
	August	2007	\$ -	\$ -	0
	September	2007	\$ -	\$ -	0
	October	2007	\$ -	\$ -	51
	November	2007	\$ -	\$ -	1,599
	December	2007	\$ -	\$ -	4,033
	January	2008	\$ -	\$ -	2,477
	February	2008	\$ -	\$ -	2,129
	March	2008	\$ -	\$ -	1,866
	April	2008	\$ -	\$ -	1,513
	May	2008	\$ -	\$ -	3,948
	June	2008	\$ -	\$ -	0
	July	2008	\$ -	\$ -	0
	August	2008	\$ -	\$ -	0
	September	2008	\$ -	\$ -	0
	October	2008	\$ -	\$ -	0
	November	2008	\$ -	\$ -	154
	December	2008	\$ -	\$ -	4,748
	January	2009	\$ -	\$ -	4,170
	February	2009	\$ -	\$ -	5,314
	March	2009	\$ -	\$ -	0
	April	2009	\$ -	\$ -	0
	May	2009	\$ -	\$ -	0
	June	2009	\$ -	\$ -	0
	July	2009	\$ -	\$ -	0
	August	2009	\$ -	\$ -	0
	September	2009	\$ -	\$ -	180
	October	2009	\$ -	\$ -	5,414
	November	2009	\$ -	\$ -	0
	December	2009	\$ -	\$ -	111
	January	2010	\$ -	\$ -	3,436
	February	2010	\$ -	\$ -	2,977
	March	2010	\$ -	\$ -	2,567
	April	2010	\$ -	\$ -	1,402
	May	2010	\$ -	\$ -	0
	June	2010	\$ -	\$ -	0

Month	Combined (Gallons)
January	3361
February	3474
March	1478
April	971
May	1316
June	0
July	0
August	0
September	60
October	1822
November	584
December	2964
Total	16030



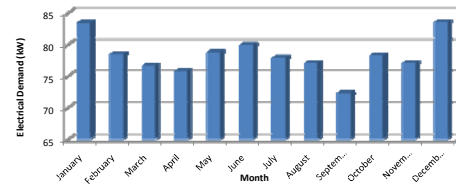
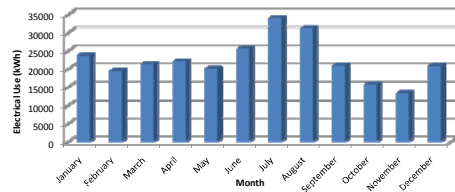
Electric Bills for Plots - Well House #1									
			CL & P Delivery Charges Ac # 51430063040 Meter # 886100742	0 Supply Charges Ac #					
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh	
Not Consecutive	March	2009	\$ 51.23	\$ -	\$ 51.23	241	0.9	\$ 0.02	
	April	2009	\$ 90.96	\$ -	\$ 90.96	1166	4.2	\$ 0.08	
	May	2009	\$ 142.43	\$ -	\$ 142.43	1455	2.8	\$ 0.10	
June-Nov Estimated	June	2009	\$ 486.51	\$ -	\$ 486.51	4752	25.8	\$ 0.10	
June-Nov Estimated	July	2009	\$ 415.63	\$ -	\$ 415.63	2276	25.8	\$ 0.18	
June-Nov Estimated	August	2009	\$ 395.25	\$ -	\$ 395.25	2276	25.8	\$ 0.17	
June-Nov Estimated	September	2009	\$ 380.89	\$ -	\$ 380.89	2203	25.8	\$ 0.17	
June-Nov Estimated	October	2009	\$ 389.39	\$ -	\$ 389.39	2276	25.8	\$ 0.17	
June-Nov Estimated	November	2009	\$ 216.57	\$ -	\$ 216.57	1305	25.8	\$ 0.17	
Dec-Jan Estimated	December	2009	\$ 103.09	\$ -	\$ 103.09	1138	1.0	\$ 0.09	
June-July Estimated	January	2010	\$ 154.13	\$ -	\$ 154.13	1997	8.5	\$ 0.08	
	February	2010	\$ 117.90	\$ -	\$ 117.90	1541	5.4	\$ 0.08	
	March	2010	\$ 92.79	\$ -	\$ 92.79	1047	4.6	\$ 0.09	
	April	2010	\$ 60.00	\$ -	\$ 60.00	582	2.8	\$ 0.10	
	May	2010	\$ 121.42	\$ -	\$ 121.42	726	2.8	\$ 0.17	
	June	2010	\$ 380.91	\$ -	\$ 380.91	2265	26.7	\$ 0.17	
	July	2010	\$ 413.91	\$ -	\$ 413.91	3348	25.2	\$ 0.12	
	Not Consecutive	August	2010	\$ 237.88	\$ -	\$ 237.88	1547	25.5	\$ 0.15

Month	Combings (KWH)	Demand (KW)
January	1597	9
February	1541	5
March	1047	5
April	874	4
May	1090	3
June	3509	26
July	2812	26
August	2276	26
September	2203	26
October	2276	26
November	1305	26
December	1138	1
Total	22067	



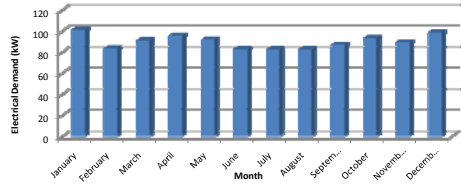
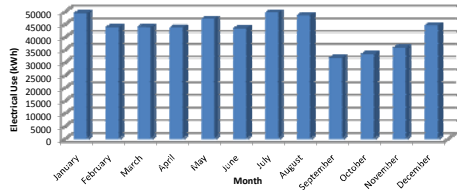
Electric Bills for Plots - Well House # 2								
			CL & P Delivery Charges Ac # 51844163030 Meter # 820867202	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per KWH
Not Consecutive	March	2009	\$ 950.91	\$ -	\$ 950.91	14878	86.6	\$ 0.06
	April	2009	\$ 1,722.82	\$ -	\$ 1,722.82	27987	80.5	\$ 0.06
May-July Estimated	May	2009	\$ 1,763.85	\$ -	\$ 1,763.85	31028	73.1	\$ 0.06
May-July Estimated	June	2009	\$ 1,586.08	\$ -	\$ 1,586.08	30405	73.1	\$ 0.05
	July	2009	\$ 1,676.84	\$ -	\$ 1,676.84	32091	72.5	\$ 0.05
	August	2009	\$ 1,639.43	\$ -	\$ 1,639.43	27795	71.0	\$ 0.06
	September	2009	\$ 1,558.62	\$ -	\$ 1,558.62	20888	72.3	\$ 0.07
	October	2009	\$ 1,685.20	\$ -	\$ 1,685.20	15612	78.2	\$ 0.11
	November	2009	\$ 1,544.99	\$ -	\$ 1,544.99	13341	77.0	\$ 0.12
Dec-Jan Estimated	December	2009	\$ 1,560.44	\$ -	\$ 1,560.44	20812	83.5	\$ 0.07
	January	2010	\$ 1,744.59	\$ -	\$ 1,744.59	23642	83.4	\$ 0.07
	February	2010	\$ 1,541.22	\$ -	\$ 1,541.22	19308	78.4	\$ 0.08
	March	2010	\$ 1,628.93	\$ -	\$ 1,628.93	21278	76.6	\$ 0.08
	April	2010	\$ 1,556.72	\$ -	\$ 1,556.72	15887	71.0	\$ 0.10
	May	2010	\$ 1,513.82	\$ -	\$ 1,513.82	8975	84.4	\$ 0.17
	June	2010	\$ 1,646.16	\$ -	\$ 1,646.16	20656	86.7	\$ 0.08
	July	2010	\$ 1,928.27	\$ -	\$ 1,928.27	35682	83.2	\$ 0.05
	August	2010	\$ 1,811.35	\$ -	\$ 1,811.35	34534	83.0	\$ 0.05
Not Consecutive	September	2010	\$ 776.24	\$ -	\$ 776.24	14802	0.0	\$ 0.06

Month	Combined (KWH)	Demand (KW)
January	23642	83
February	19308	78
March	21278	77
April	21937	76
May	20001	79
June	25530	80
July	33887	78
August	31165	77
September	20888	72
October	15612	78
November	13341	77
December	20812	84
Total	267401	



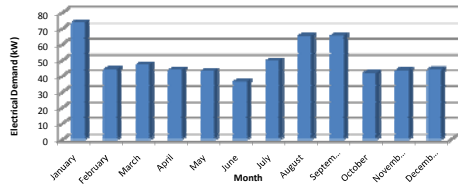
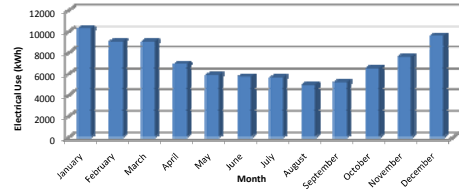
Electric Bills for Plots - Well House #3-5, Generator & Chemical Control								
			CL & P Delivery Charges Ac # 51826553018 Meter # 875932009	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 1,417.60	\$ -	\$ 1,417.60	26003	99.5	\$ 0.05
	April	2009	\$ 1,968.63	\$ -	\$ 1,968.63	44972	97.0	\$ 0.04
	May	2009	\$ 2,082.76	\$ -	\$ 2,082.76	49878	90.9	\$ 0.04
	June	2009	\$ 1,887.87	\$ -	\$ 1,887.87	45910	86.1	\$ 0.04
	July	2009	\$ 1,832.18	\$ -	\$ 1,832.18	53476	84.6	\$ 0.03
	August	2009	\$ 1,851.92	\$ -	\$ 1,851.92	48741	85.4	\$ 0.04
	September	2009	\$ 1,927.59	\$ -	\$ 1,927.59	31796	86.6	\$ 0.06
	October	2009	\$ 2,030.07	\$ -	\$ 2,030.07	33181	93.0	\$ 0.06
	November	2009	\$ 1,797.20	\$ -	\$ 1,797.20	35612	89.0	\$ 0.05
	December	2009	\$ 1,915.11	\$ -	\$ 1,915.11	44453	98.6	\$ 0.04
	Dec-Jan Estimated							
	Not Consecutive	January	2010	\$ 2,230.43	\$ -	\$ 2,230.43	49239	100.8
February		2010	\$ 1,971.23	\$ -	\$ 1,971.23	43740	83.2	\$ 0.05
March		2010	\$ 2,013.32	\$ -	\$ 2,013.32	43837	90.7	\$ 0.05
April		2010	\$ 2,039.81	\$ -	\$ 2,039.81	42219	93.8	\$ 0.05
May		2010	\$ 2,143.78	\$ -	\$ 2,143.78	44274	92.3	\$ 0.05
June		2010	\$ 1,897.96	\$ -	\$ 1,897.96	40687	79.2	\$ 0.05
July		2010	\$ 2,021.57	\$ -	\$ 2,021.57	45357	79.5	\$ 0.04
August		2010	\$ 2,038.52	\$ -	\$ 2,038.52	48128	79.8	\$ 0.04
September		2010	\$ 646.83	\$ -	\$ 646.83	16636	0.0	\$ 0.04
Not Consecutive								

Month	Combined (KWH)	Demand (KW)
January	49239	101
February	43740	83
March	43837	91
April	43596	95
May	47076	92
June	43298	83
July	49416	82
August	48434	83
September	31796	87
October	33181	93
November	35612	89
December	44453	99
Total	513681	

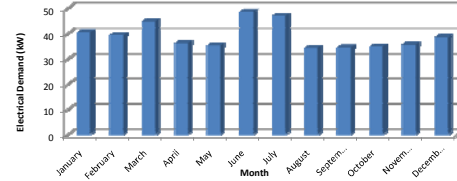
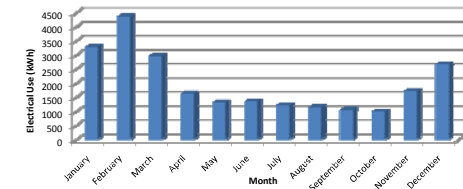


Electric Bills for Plots - Pump & Control Building Peck Lane								
Comments	Month	Year	CL & P Delivery Charges Ac # 51078993052 Meter # 889149882	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	February	2009	\$ 60.60	\$ -	\$ 60.60	639	9.6	\$ 0.09
May-June Estimated	March	2009	\$ 902.55	\$ -	\$ 902.55	9541	49.6	\$ 0.09
	April	2009	\$ 688.40	\$ -	\$ 688.40	7259	43.8	\$ 0.09
	May	2009	\$ 695.66	\$ -	\$ 695.66	5694	42.7	\$ 0.12
	June	2009	\$ 575.30	\$ -	\$ 575.30	5199	36.5	\$ 0.11
	July	2009	\$ 489.99	\$ -	\$ 489.99	4630	34.6	\$ 0.11
	August	2009	\$ 961.36	\$ -	\$ 961.36	4927	65.3	\$ 0.20
	September	2009	\$ 870.28	\$ -	\$ 870.28	5168	65.4	\$ 0.17
	October	2009	\$ 685.44	\$ -	\$ 685.44	6489	41.7	\$ 0.11
	November	2009	\$ 728.58	\$ -	\$ 728.58	7577	43.4	\$ 0.10
	December	2009	\$ 770.05	\$ -	\$ 770.05	9550	44.0	\$ 0.08
Dec-Jan Estimated								
June-July Estimated	January	2010	\$ 1,062.15	\$ -	\$ 1,062.15	10255	73.5	\$ 0.10
	February	2010	\$ 782.55	\$ -	\$ 782.55	9037	44.1	\$ 0.09
	March	2010	\$ 810.23	\$ -	\$ 810.23	8813	44.1	\$ 0.10
	April	2010	\$ 679.33	\$ -	\$ 679.33	6534	43.7	\$ 0.10
	May	2010	\$ 738.01	\$ -	\$ 738.01	5997	43.4	\$ 0.12
	June	2010	\$ 648.06	\$ -	\$ 648.06	6175	36.1	\$ 0.10
	July	2010	\$ 839.21	\$ -	\$ 839.21	6584	64.5	\$ 0.13
	August	2010	\$ 854.34	\$ -	\$ 854.34	6061	66.3	\$ 0.13
Not Consecutive								
Not Consecutive	September	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!

Month	Combined (KWH)	Demand (KW)
January	10255	74
February	9037	44
March	9027	47
April	6897	44
May	5846	43
June	5687	36
July	5607	50
August	4927	65
September	5168	65
October	6489	42
November	7577	43
December	9550	44
Total	86066	



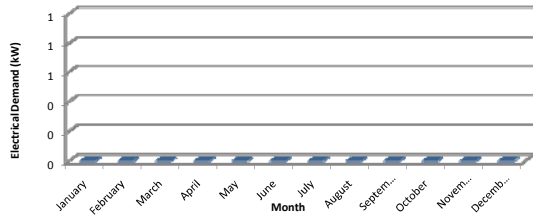
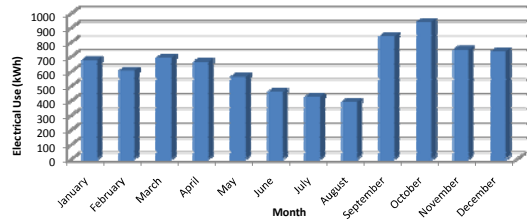
Electric Bills for Plots - Pump & Control Building Wolcott Street								
			CL & P Delivery Charges Ac # 51142234020 Meter # 890527152	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	February	2009	\$	\$	\$ 67.66	290	6.4	\$ 0.96
	March	2009	\$	\$	\$ 659.59	2248	50.9	\$ 0.29
	April	2009	\$	\$	\$ 424.37	1492	35.3	\$ 0.28
	May	2009	\$	\$	\$ 465.81	1068	34.5	\$ 0.44
	June	2009	\$	\$	\$ 453.68	1243	35.0	\$ 0.36
	July	2009	\$	\$	\$ 423.49	1079	34.2	\$ 0.39
	August	2009	\$	\$	\$ 472.73	1131	34.2	\$ 0.42
	September	2009	\$	\$	\$ 443.81	1051	34.3	\$ 0.42
	October	2009	\$	\$	\$ 454.60	988	34.7	\$ 0.46
	November	2009	\$	\$	\$ 484.81	1719	35.5	\$ 0.28
	December	2009	\$	\$	\$ 503.76	2668	38.4	\$ 0.19
	Not Consecutive	January	2010	\$	\$	\$ 601.42	3285	40.3
February		2010	\$	\$	\$ 588.13	4352	39.3	\$ 0.14
March		2010	\$	\$	\$ 596.57	3678	38.6	\$ 0.16
April		2010	\$	\$	\$ 463.35	1761	36.9	\$ 0.26
May		2010	\$	\$	\$ 572.23	1551	35.7	\$ 0.37
June		2010	\$	\$	\$ 774.49	1460	61.8	\$ 0.53
July		2010	\$	\$	\$ 714.26	1336	59.7	\$ 0.53
August		2010	\$	\$	\$ 413.78	1683	33.9	\$ 0.26



Month	Combined (KWH)	Demand (KW)
January	3285	40
February	4352	39
March	2963	45
April	1627	36
May	1309	35
June	1351	48
July	1208	47
August	1131	34
September	1051	34
October	988	35
November	1719	36
December	2668	38
Total	23651	

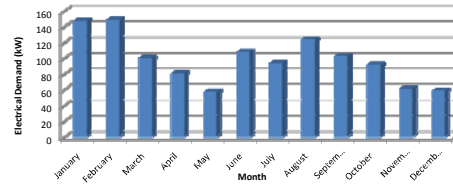
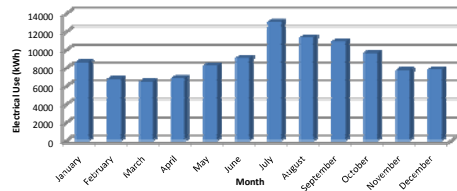
Electric Bills for Plots - Chemical Control Building								
			CL & P Delivery Charges Ac # 51596674077 Meter # 866330802	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 97.84	\$ -	\$ 97.84	482	0.0	\$ 0.20
	April	2009	\$ 135.56	\$ -	\$ 135.56	671	0.0	\$ 0.20
	May	2009	\$ 126.35	\$ -	\$ 126.35	616	0.0	\$ 0.21
	June	2009	\$ 110.29	\$ -	\$ 110.29	531	0.0	\$ 0.21
	July	2009	\$ 112.52	\$ -	\$ 112.52	539	0.0	\$ 0.21
	August	2009	\$ 114.97	\$ -	\$ 114.97	551	0.0	\$ 0.21
	September	2009	\$ 164.67	\$ -	\$ 164.67	837	0.0	\$ 0.20
	October	2009	\$ 184.40	\$ -	\$ 184.40	936	0.0	\$ 0.20
	November	2009	\$ 150.07	\$ -	\$ 150.07	746	0.0	\$ 0.20
	December	2009	\$ 144.05	\$ -	\$ 144.05	732	0.0	\$ 0.20
	January	2010	\$ 131.89	\$ -	\$ 131.89	675	0.0	\$ 0.20
	February	2010	\$ 116.96	\$ -	\$ 116.96	604	0.0	\$ 0.19
	March	2010	\$ 131.61	\$ -	\$ 131.61	688	0.0	\$ 0.19
	April	2010	\$ 126.28	\$ -	\$ 126.28	656	0.0	\$ 0.19
	May	2010	\$ 101.88	\$ -	\$ 101.88	506	0.0	\$ 0.20
	June	2010	\$ 79.82	\$ -	\$ 79.82	383	0.0	\$ 0.21
	July	2010	\$ 68.15	\$ -	\$ 68.15	306	0.0	\$ 0.22
	August	2010	\$ 54.67	\$ -	\$ 54.67	227	0.0	\$ 0.24
Not Consecutive	September	2010	\$ 16.76	\$ -	\$ 16.76	69	0.0	\$ 0.24

Month	Combined (KWH)	Demand (KW)
January	675	0
February	604	0
March	688	0
April	663	0
May	561	0
June	457	0
July	423	0
August	389	0
September	837	0
October	936	0
November	746	0
December	732	0
Total	7711	0



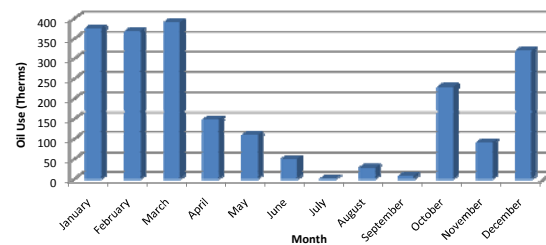
Electric Bills for Plots - Pump & Control & Generator Building Hill Street								
			CL & P Delivery Charges Ac # 51383853066 Meter # 886921962	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 671.85	\$ -	\$ 671.85	3600	0.0	\$ 0.19
	April	2009	\$ 1,182.88	\$ -	\$ 1,182.88	8187	105.0	\$ 0.14
May-June Estimated	May	2009	\$ 1,174.76	\$ -	\$ 1,174.76	9344	59.2	\$ 0.13
June-July Estimated	June	2009	\$ 1,943.18	\$ -	\$ 1,943.18	8051	151.7	\$ 0.24
	July	2009	\$ 1,971.49	\$ -	\$ 1,971.49	12623	102.4	\$ 0.16
	August	2009	\$ 1,980.19	\$ -	\$ 1,980.19	11487	156.3	\$ 0.17
	September	2009	\$ 1,466.84	\$ -	\$ 1,466.84	10869	102.6	\$ 0.13
	October	2009	\$ 1,210.72	\$ -	\$ 1,210.72	9610	91.5	\$ 0.13
	November	2009	\$ 909.99	\$ -	\$ 909.99	7702	61.3	\$ 0.12
Dec-Jan Estimated	December	2009	\$ 1,357.05	\$ -	\$ 1,357.05	7775	58.4	\$ 0.17
	January	2010	\$ 1,947.71	\$ -	\$ 1,947.71	8546	147.4	\$ 0.23
	February	2010	\$ 1,680.78	\$ -	\$ 1,680.78	6737	148.5	\$ 0.25
March-Apr Estimated	March	2010	\$ 1,220.90	\$ -	\$ 1,220.90	6469	100.0	\$ 0.19
	April	2010	\$ 859.98	\$ -	\$ 859.98	5493	56.5	\$ 0.16
	May	2010	\$ 997.68	\$ -	\$ 997.68	7108	55.2	\$ 0.14
June-July Estimated	June	2010	\$ 1,093.03	\$ -	\$ 1,093.03	10031	63.2	\$ 0.11
	July	2010	\$ 1,354.37	\$ -	\$ 1,354.37	13486	84.2	\$ 0.10
	August	2010	\$ 1,385.92	\$ -	\$ 1,385.92	11141	91.0	\$ 0.12
Not Consecutive	September	2010	\$ 600.63	\$ -	\$ 600.63	6742	55.8	\$ 0.10

Month	Combined (KWH)	Demand (KW)
January	8546	147
February	6737	149
March	6469	100
April	6840	81
May	8226	57
June	9041	107
July	13054	93
August	11314	124
September	10869	103
October	9610	92
November	7702	61
December	7775	58
Total	106183	



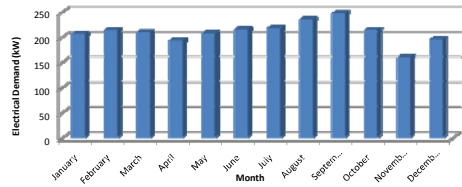
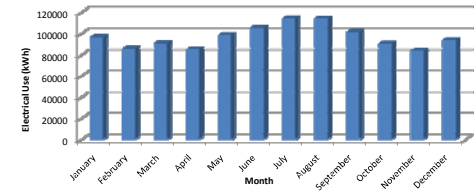
Oil Bills for Plots - Hill St P&C Bldg						
Comments	Month	Year	Buckley Delivery Charges Ac. # 1908-005 Meter # 0	Total Oil Charges	Total Therms	Cost Per Therm
	January	2007	\$ -	\$ -	-	
	February	2007	\$ -	\$ -	-	
	March	2007	\$ -	\$ -	-	
	April	2007	\$ -	\$ -	-	
	May	2007	\$ -	\$ -	-	
	June	2007	\$ -	\$ -	-	
	July	2007	\$ -	\$ -	3	
	August	2007	\$ -	\$ -	85	
	September	2007	\$ -	\$ -	0	
	October	2007	\$ -	\$ -	4	
	November	2007	\$ -	\$ -	117	
	December	2007	\$ -	\$ -	423	
	January	2008	\$ -	\$ -	12	
	February	2008	\$ -	\$ -	342	
	March	2008	\$ -	\$ -	504	
	April	2008	\$ -	\$ -	250	
	May	2008	\$ -	\$ -	328	
	June	2008	\$ -	\$ -	85	
	July	2008	\$ -	\$ -	0	
	August	2008	\$ -	\$ -	0	
	September	2008	\$ -	\$ -	12	
	October	2008	\$ -	\$ -	348	
	November	2008	\$ -	\$ -	87	
	December	2008	\$ -	\$ -	201	
	January	2009	\$ -	\$ -	684	
	February	2009	\$ -	\$ -	266	
	March	2009	\$ -	\$ -	482	
	April	2009	\$ -	\$ -	0	
	May	2009	\$ -	\$ -	0	
	June	2009	\$ -	\$ -	0	
	July	2009	\$ -	\$ -	0	
	August	2009	\$ -	\$ -	0	
	September	2009	\$ -	\$ -	11	
	October	2009	\$ -	\$ -	337	
	November	2009	\$ -	\$ -	69	
	December	2009	\$ -	\$ -	334	
	January	2010	\$ -	\$ -	432	
	February	2010	\$ -	\$ -	496	
	March	2010	\$ -	\$ -	185	
	April	2010	\$ -	\$ -	195	
	May	2010	\$ -	\$ -	2	
	June	2010	\$ -	\$ -	66	
	July	2010	\$ -	\$ -	-	
	August	2010	\$ -	\$ -	-	
	September	2010	\$ -	\$ -	-	
	October	2010	\$ -	\$ -	-	
	November	2010	\$ -	\$ -	-	
	December	2010	\$ -	\$ -	-	

Month	Combined (Therms)
January	376
February	368
March	390
April	148
May	110
June	50
July	1
August	28
September	8
October	229
November	91
December	320
Total	2119



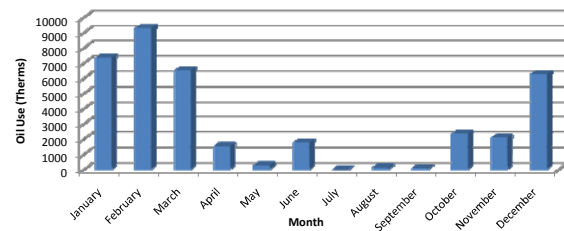
Electric Bills for Plots - Police Court								
			CL & P Delivery Charges Ac # 51599553047 Meter # 821720242	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 1,760.48	\$ -	\$ 1,760.48	40163	0.0	\$ 0.04
	April	2009	\$ 3,712.84	\$ -	\$ 3,712.84	84467	176.4	\$ 0.04
	May	2009	\$ 4,151.55	\$ -	\$ 4,151.55	96986	214.6	\$ 0.04
	June	2009	\$ 3,949.79	\$ -	\$ 3,949.79	103955	210.2	\$ 0.04
	July	2009	\$ 4,127.38	\$ -	\$ 4,127.38	115094	199.4	\$ 0.04
	August	2009	\$ 4,546.89	\$ -	\$ 4,546.89	116111	238.3	\$ 0.04
	September	2009	\$ 4,171.85	\$ -	\$ 4,171.85	101129	247.0	\$ 0.04
	October	2009	\$ 3,932.56	\$ -	\$ 3,932.56	90081	213.8	\$ 0.04
	November	2009	\$ 3,596.54	\$ -	\$ 3,596.54	83544	159.8	\$ 0.04
	December	2009	\$ 3,890.93	\$ -	\$ 3,890.93	93735	195.1	\$ 0.04
Dec-Feb Estimated								
Dec-Feb Estimated	January	2010	\$ 4,198.37	\$ -	\$ 4,198.37	96638	205.9	\$ 0.04
	February	2010	\$ 4,130.48	\$ -	\$ 4,130.48	85655	213.1	\$ 0.05
	March	2010	\$ 4,327.74	\$ -	\$ 4,327.74	90827	208.8	\$ 0.05
	April	2010	\$ 4,084.47	\$ -	\$ 4,084.47	85940	210.2	\$ 0.05
	May	2010	\$ 4,606.93	\$ -	\$ 4,606.93	99784	199.4	\$ 0.05
	June	2010	\$ 4,559.64	\$ -	\$ 4,559.64	106554	218.9	\$ 0.04
	July	2010	\$ 4,895.59	\$ -	\$ 4,895.59	112920	234.7	\$ 0.04
	August	2010	\$ 4,761.04	\$ -	\$ 4,761.04	111688	231.1	\$ 0.04
	September	2010	\$ 2,668.68	\$ -	\$ 2,668.68	63128	222.5	\$ 0.04
	Not Consecutive							

Month	Combined (KWH)	Demand (KW)
January	96538	205
February	85655	213
March	90827	209
April	85204	193
May	98385	207
June	105254	215
July	114007	217
August	113900	235
September	101129	247
October	90081	214
November	83544	160
December	93735	195
Total	1158360	



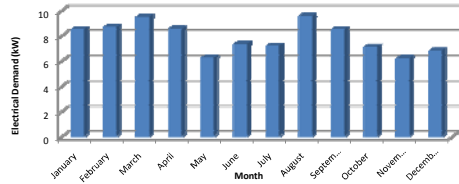
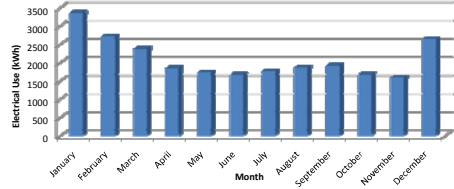
Oil Bills for Plots -							
Comments	Month	Year	Buckley Delivery Charges Ac. # 1905-002 Meter # 891790242		Total Oil Charges	Total Therms	
	January	2007	\$	-	\$	-	332
	February	2007	\$	-	\$	-	9,295
	March	2007	\$	-	\$	-	11,454
	April	2007	\$	-	\$	-	2,040
	May	2007	\$	-	\$	-	0
	June	2007	\$	-	\$	-	0
	July	2007	\$	-	\$	-	11
	August	2007	\$	-	\$	-	340
	September	2007	\$	-	\$	-	0
	October	2007	\$	-	\$	-	91
	November	2007	\$	-	\$	-	2,813
	December	2007	\$	-	\$	-	5,474
	January	2008	\$	-	\$	-	8,174
	February	2008	\$	-	\$	-	7,744
	March	2008	\$	-	\$	-	4,503
	April	2008	\$	-	\$	-	1,990
	May	2008	\$	-	\$	-	0
	June	2008	\$	-	\$	-	0
	July	2008	\$	-	\$	-	0
	August	2008	\$	-	\$	-	0
	September	2008	\$	-	\$	-	193
	October	2008	\$	-	\$	-	5,797
	November	2008	\$	-	\$	-	256
	December	2008	\$	-	\$	-	8,073
	January	2009	\$	-	\$	-	12,492
	February	2009	\$	-	\$	-	8,220
	March	2009	\$	-	\$	-	5,404
	April	2009	\$	-	\$	-	0
	May	2009	\$	-	\$	-	242
	June	2009	\$	-	\$	-	7,007
	July	2009	\$	-	\$	-	0
	August	2009	\$	-	\$	-	0
	September	2009	\$	-	\$	-	34
	October	2009	\$	-	\$	-	1,112
	November	2009	\$	-	\$	-	3,120
	December	2009	\$	-	\$	-	5,247
	January	2010	\$	-	\$	-	8,362
	February	2010	\$	-	\$	-	11,819
	March	2010	\$	-	\$	-	4,655
	April	2010	\$	-	\$	-	2,121
	May	2010	\$	-	\$	-	806
	June	2010	\$	-	\$	-	0
	July	2010	\$	-	\$	-	-
	August	2010	\$	-	\$	-	-
	September	2010	\$	-	\$	-	-
	October	2010	\$	-	\$	-	-
	November	2010	\$	-	\$	-	-
	December	2010	\$	-	\$	-	-

Month	Combined (Therms)
January	7340
February	9269
March	6504
April	1538
May	262
June	1752
July	4
August	113
September	76
October	2333
November	2063
December	6265
Total	37518



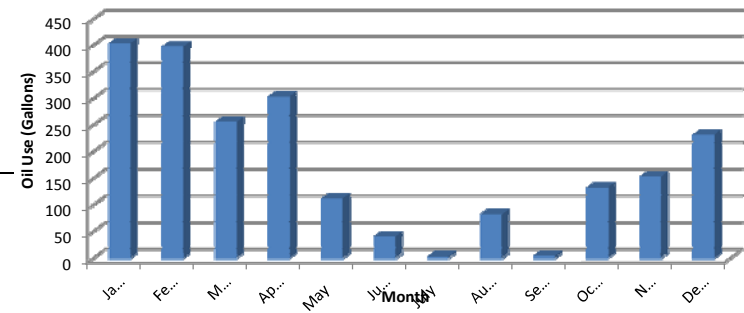
Electric Bills for Plots - Rockwell Park								
Comments	Month	Year	CL & P Delivery Charges Ac # 51186753091 Meter # 886989342	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 225.09	\$ -	\$ 225.09	1106	6.5	\$ 0.20
	April	2009	\$ 374.96	\$ -	\$ 374.96	1829	7.7	\$ 0.20
	May	2009	\$ 343.19	\$ -	\$ 343.19	1615	5.8	\$ 0.21
June-July Estimated	June	2009	\$ 335.30	\$ -	\$ 335.30	1579	7.4	\$ 0.21
	July	2009	\$ 390.46	\$ -	\$ 390.46	1796	6.0	\$ 0.22
	August	2009	\$ 439.46	\$ -	\$ 439.46	2039	10.5	\$ 0.22
	September	2009	\$ 397.50	\$ -	\$ 397.50	1906	8.5	\$ 0.21
	October	2009	\$ 350.53	\$ -	\$ 350.53	1667	7.1	\$ 0.21
	November	2009	\$ 331.30	\$ -	\$ 331.30	1571	6.2	\$ 0.21
Dec-Jan Estimated	December	2009	\$ 504.55	\$ -	\$ 504.55	2628	6.8	\$ 0.19
	January	2010	\$ 612.89	\$ -	\$ 612.89	3342	8.5	\$ 0.18
	February	2010	\$ 512.34	\$ -	\$ 512.34	2701	8.7	\$ 0.19
	March	2010	\$ 480.38	\$ -	\$ 480.38	2368	9.5	\$ 0.20
	April	2010	\$ 380.07	\$ -	\$ 380.07	1855	9.4	\$ 0.20
	May	2010	\$ 365.78	\$ -	\$ 365.78	1817	6.7	\$ 0.20
June-July Estimated	June	2010	\$ 358.90	\$ -	\$ 358.90	1723	7.3	\$ 0.21
	July	2010	\$ 368.16	\$ -	\$ 368.16	1706	8.4	\$ 0.22
	August	2010	\$ 359.09	\$ -	\$ 359.09	1659	8.6	\$ 0.22
Not Consecutive	September	2010	\$ 173.46	\$ -	\$ 173.46	807	8.3	\$ 0.22

Month	Combined (KWH)	Demand (KW)
January	3342	9
February	2701	9
March	2368	10
April	1842	9
May	1716	6
June	1651	7
July	1751	7
August	1849	10
September	1906	9
October	1667	7
November	1571	6
December	2628	7
Total	24993	



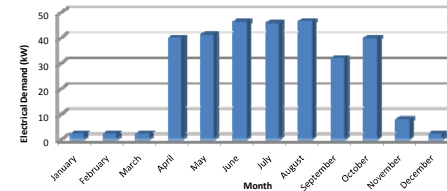
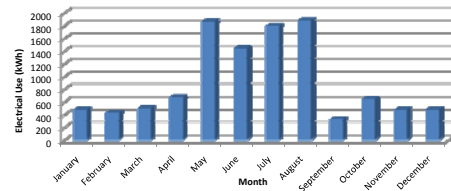
Oil Bills for Plots - Rockwell Park						
Comments	Month	Year	Buckley Delivery Charges Ac. # 1906-001 Meter # 886989342	Total Oil Charges	Total Gallons	Cost Per Gallon
	January	2007	\$ -	\$ -	26	
	February	2007	\$ -	\$ -	718	
	March	2007	\$ -	\$ -	20	
	April	2007	\$ -	\$ -	586	
	May	2007	\$ -	\$ -	0	
	June	2007	\$ -	\$ -	0	
	July	2007	\$ -	\$ -	8	
	August	2007	\$ -	\$ -	247	
	September	2007	\$ -	\$ -	0	
	October	2007	\$ -	\$ -	11	
	November	2007	\$ -	\$ -	309	
	December	2007	\$ -	\$ -	22	
	January	2008	\$ -	\$ -	674	
	February	2008	\$ -	\$ -	24	
	March	2008	\$ -	\$ -	726	
	April	2008	\$ -	\$ -	13	
	May	2008	\$ -	\$ -	393	
	June	2008	\$ -	\$ -	0	
	July	2008	\$ -	\$ -	0	
	August	2008	\$ -	\$ -	0	
	September	2008	\$ -	\$ -	10	
	October	2008	\$ -	\$ -	289	
	November	2008	\$ -	\$ -	14	
	December	2008	\$ -	\$ -	440	
	January	2009	\$ -	\$ -	504	
	February	2009	\$ -	\$ -	480	
	March	2009	\$ -	\$ -	14	
	April	2009	\$ -	\$ -	402	
	May	2009	\$ -	\$ -	6	
	June	2009	\$ -	\$ -	164	
	July	2009	\$ -	\$ -	0	
	August	2009	\$ -	\$ -	0	
	September	2009	\$ -	\$ -	3	
	October	2009	\$ -	\$ -	97	
	November	2009	\$ -	\$ -	135	
	December	2009	\$ -	\$ -	230	
	January	2010	\$ -	\$ -	408	
	February	2010	\$ -	\$ -	364	
	March	2010	\$ -	\$ -	260	
	April	2010	\$ -	\$ -	210	
	May	2010	\$ -	\$ -	48	
	June	2010	\$ -	\$ -	0	
	July	2010	\$ -	\$ -	-	
	August	2010	\$ -	\$ -	-	
	September	2010	\$ -	\$ -	-	
	October	2010	\$ -	\$ -	-	
	November	2010	\$ -	\$ -	-	
	December	2010	\$ -	\$ -	-	

Month	Combined (Gallons)
January	403
February	397
March	255
April	303
May	112
June	41
July	3
August	82
September	4
October	132
November	153
December	231
Total	2116



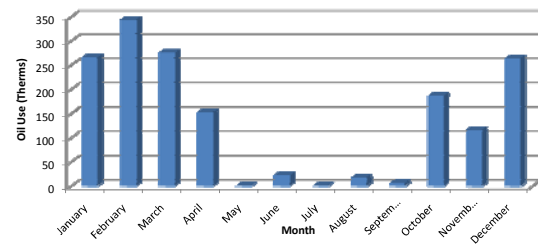
Electric Bills for Plots - Rockwell Pavilion							
Comments	Month	Year	CL & P Delivery Charges Ac # 51774294029 Meter # 831388992	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand
Not Consecutive	August	2009	\$ 71.09	\$ -	\$ 71.09	48	0.4
	September	2009	\$ 449.33	\$ -	\$ 449.33	323	31.7
	October	2009	\$ 518.58	\$ -	\$ 518.58	639	39.6
	November	2009	\$ 166.46	\$ -	\$ 166.46	472	7.7
	December	2009	\$ 108.72	\$ -	\$ 108.72	478	2.0
Dec-Jan Estimated							
June-July Estimated	January	2010	\$ 109.40	\$ -	\$ 109.40	471	2.0
	February	2010	\$ 99.25	\$ -	\$ 99.25	422	2.0
	March	2010	\$ 179.88	\$ -	\$ 179.88	494	2.0
	April	2010	\$ 541.87	\$ -	\$ 541.87	670	39.7
	May	2010	\$ 827.79	\$ -	\$ 827.79	1861	41.1
	June	2010	\$ 762.44	\$ -	\$ 762.44	1440	46.1
	July	2010	\$ 812.96	\$ -	\$ 812.96	1791	45.5
	August	2010	\$ 859.75	\$ -	\$ 859.75	1876	46.2
	September	2010	\$ 707.86	\$ -	\$ 707.86	1664	45.2
	October	2010	\$ 518.58	\$ -	\$ 518.58	639	39.6
Not Consecutive							

Month	Combined (KWH)	Demand (KW)
January	471	2
February	422	2
March	494	2
April	670	40
May	1861	41
June	1440	46
July	1791	46
August	1876	46
September	323	32
October	639	40
November	472	8
December	478	2
Total	10936	



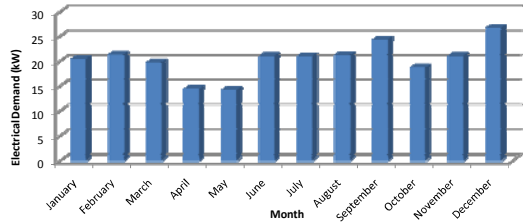
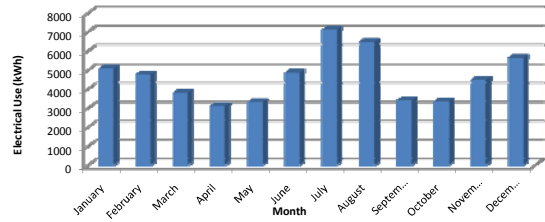
Oil Bills for Plots - Rockwell Pavilion					
Comments	Month	Year	Buckley Delivery Charges Ac. # 1906-002 Meter # 891388992	Total Oil Charges	Total Therms
	January	2007	\$ -	\$ -	17
	February	2007	\$ -	\$ -	472
	March	2007	\$ -	\$ -	0
	April	2007	\$ -	\$ -	0
	May	2007	\$ -	\$ -	0
	June	2007	\$ -	\$ -	0
	July	2007	\$ -	\$ -	2
	August	2007	\$ -	\$ -	53
	September	2007	\$ -	\$ -	0
	October	2007	\$ -	\$ -	5
	November	2007	\$ -	\$ -	157
	December	2007	\$ -	\$ -	18
	January	2008	\$ -	\$ -	548
	February	2008	\$ -	\$ -	23
	March	2008	\$ -	\$ -	699
	April	2008	\$ -	\$ -	0
	May	2008	\$ -	\$ -	0
	June	2008	\$ -	\$ -	0
	July	2008	\$ -	\$ -	0
	August	2008	\$ -	\$ -	0
	September	2008	\$ -	\$ -	18
	October	2008	\$ -	\$ -	548
	November	2008	\$ -	\$ -	18
	December	2008	\$ -	\$ -	549
	January	2009	\$ -	\$ -	19
	February	2009	\$ -	\$ -	512
	March	2009	\$ -	\$ -	14
	April	2009	\$ -	\$ -	404
	May	2009	\$ -	\$ -	3
	June	2009	\$ -	\$ -	92
	July	2009	\$ -	\$ -	0
	August	2009	\$ -	\$ -	0
	September	2009	\$ -	\$ -	0
	October	2009	\$ -	\$ -	6
	November	2009	\$ -	\$ -	174
	December	2009	\$ -	\$ -	224
	January	2010	\$ -	\$ -	481
	February	2010	\$ -	\$ -	368
	March	2010	\$ -	\$ -	390
	April	2010	\$ -	\$ -	208
	May	2010	\$ -	\$ -	0
	June	2010	\$ -	\$ -	0
	July	2010	\$ -	\$ -	-
	August	2010	\$ -	\$ -	-
	September	2010	\$ -	\$ -	-
	October	2010	\$ -	\$ -	-
	November	2010	\$ -	\$ -	-
	December	2010	\$ -	\$ -	-

Month	Combined (Therms)
January	266
February	344
March	276
April	153
May	1
June	23
July	1
August	18
September	6
October	186
November	117
December	264
Total	1653



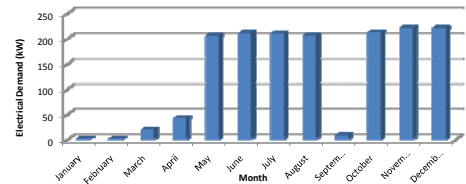
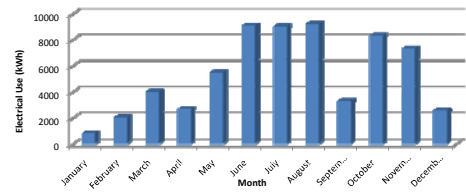
Electric Bills for Plots - Bathhouse								
Comments	Month	Year	CL & P Delivery Charges Ac # 51940953094 Meter # 891581942	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 108.46	\$ -	\$ 108.46	541	0.0	\$ 0.20
	April	2009	\$ 811.50	\$ -	\$ 811.50	3968	16.9	\$ 0.20
June-July Estimated	May	2009	\$ 842.99	\$ -	\$ 842.99	3972	16.2	\$ 0.21
	June	2009	\$ 1,077.30	\$ -	\$ 1,077.30	5030	24.5	\$ 0.21
	July	2009	\$ 1,375.30	\$ -	\$ 1,375.30	7096	24.2	\$ 0.19
	August	2009	\$ 1,321.34	\$ -	\$ 1,321.34	6537	24.1	\$ 0.20
	September	2009	\$ 808.67	\$ -	\$ 808.67	3389	24.3	\$ 0.24
	October	2009	\$ 754.75	\$ -	\$ 754.75	3339	18.7	\$ 0.23
Dec-Jan Estimated	November	2009	\$ 962.66	\$ -	\$ 962.66	4482	21.0	\$ 0.21
	December	2009	\$ 1,159.48	\$ -	\$ 1,159.48	5647	26.6	\$ 0.21
	January	2010	\$ 1,012.49	\$ -	\$ 1,012.49	5064	20.4	\$ 0.20
	February	2010	\$ 954.43	\$ -	\$ 954.43	4768	21.3	\$ 0.20
June-July Estimated	March	2010	\$ 801.26	\$ -	\$ 801.26	3792	19.7	\$ 0.21
	April	2010	\$ 472.22	\$ -	\$ 472.22	2244	11.9	\$ 0.21
	May	2010	\$ 573.73	\$ -	\$ 573.73	2655	12.2	\$ 0.22
	June	2010	\$ 907.59	\$ -	\$ 907.59	4690	17.5	\$ 0.19
	July	2010	\$ 1,264.02	\$ -	\$ 1,264.02	7112	17.7	\$ 0.18
	August	2010	\$ 1,181.15	\$ -	\$ 1,181.15	6410	18.3	\$ 0.18
Not Consecutive	September	2010	\$ 520.65	\$ -	\$ 520.65	2096	19.8	\$ 0.25

Month	Combined (KWH)	Demand (KW)
January	5064	20
February	4768	21
March	3792	20
April	3106	14
May	3314	14
June	4860	21
July	7104	21
August	6473	21
September	3389	24
October	3339	19
November	4482	21
December	5647	27
Total	55337	



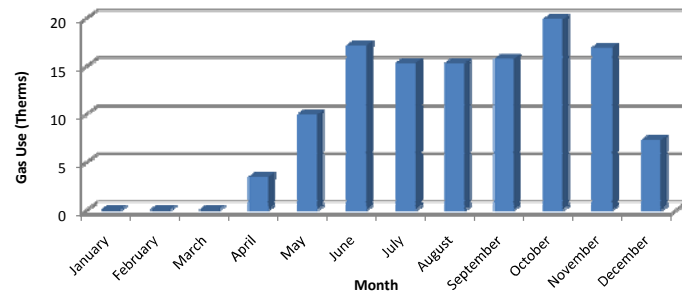
Electric Bills for Plots - Muzzy Field									
Comments	Month	Year	CL & P	0	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh	
			Delivery Charges Ac # Meter # 51555853076 851980637	Supply Charges Ac #					
Not Consecutive	March	2009	\$ 109.89	\$ -	\$ 109.89	440	9.0	\$ 0.25	
Apr-May Estimated	April	2009	\$ 913.99	\$ -	\$ 913.99	2280	13.3	\$ 0.40	
	May	2009	\$ 3,188.65	\$ -	\$ 3,188.65	5833	204.6	\$ 0.55	
June-July Estimated	June	2009	\$ 3,543.34	\$ -	\$ 3,543.34	7351	209.8	\$ 0.48	
	July	2009	\$ 3,456.37	\$ -	\$ 3,456.37	6132	208.8	\$ 0.56	
Aug-Sept Estimated	August	2009	\$ 3,425.85	\$ -	\$ 3,425.85	12529	205.0	\$ 0.27	
	September	2009	\$ 1,689.81	\$ -	\$ 1,689.81	3288	8.5	\$ 0.51	
	October	2009	\$ 3,917.41	\$ -	\$ 3,917.41	8298	211.8	\$ 0.47	
	November	2009	\$ 3,689.03	\$ -	\$ 3,689.03	7309	221.3	\$ 0.50	
Dec-Jan Estimated	December	2009	\$ 1,803.28	\$ -	\$ 1,803.28	2572	221.3	\$ 0.70	
	January	2010	\$ 168.02	\$ -	\$ 168.02	803	1.4	\$ 0.21	
	February	2010	\$ 423.35	\$ -	\$ 423.35	2021	1.6	\$ 0.21	
	March	2010	\$ 848.01	\$ -	\$ 848.01	3995	19.5	\$ 0.21	
	April	2010	\$ 1,364.63	\$ -	\$ 1,364.63	3070	71.2	\$ 0.44	
	May	2010	\$ 3,025.72	\$ -	\$ 3,025.72	5150	207.7	\$ 0.59	
June-July Estimated	June	2010	\$ 3,736.58	\$ -	\$ 3,736.58	10785	210.7	\$ 0.35	
	July	2010	\$ 3,978.46	\$ -	\$ 3,978.46	11895	210.6	\$ 0.33	
	August	2010	\$ 2,989.14	\$ -	\$ 2,989.14	5876	208.0	\$ 0.51	
Not Consecutive	September	2010	\$ 1,549.77	\$ -	\$ 1,549.77	1710	207.0	\$ 0.91	

Month	Combined (KWH)	Demand (KW)
January	815	1
February	2021	2
March	3995	20
April	2675	42
May	5492	206
June	9068	210
July	9014	210
August	9203	207
September	3288	9
October	8298	212
November	7309	221
December	2572	221
Total	63739	



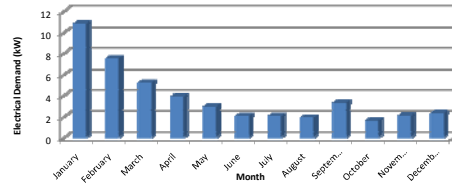
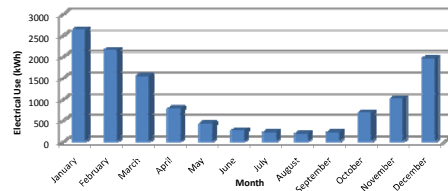
Gas Bills for Plots - Muzzy Field							
Comments	Month	Year	Yankee Gas	Hess	Total Gas Charges	Total Therms	Cost Per Therm
			Delivery Charges Ac. # 999-450-0590000389054 Meter # 891980632	Supply Charges Ac. # 450344/468400			
Not Consecutive	July	2008	\$ 7.44	\$ 17.86	\$ 25.30	5	\$ 5.29
	August	2008	\$ 24.16	\$ 59.38	\$ 83.54	16	\$ 5.38
	September	2008	\$ 24.82	\$ 55.56	\$ 80.38	16	\$ 5.04
	October	2008	\$ 31.24	\$ 57.25	\$ 88.49	20	\$ 4.40
	November	2008	\$ 25.98	\$ 51.82	\$ 77.80	17	\$ 4.60
	December	2008	\$ 11.42	\$ 47.88	\$ 59.30	8	\$ 7.71
	January	2009	\$ -	\$ 42.82	\$ 42.82	-	
	February	2009	\$ -	\$ 39.13	\$ 39.13	-	
	March	2009	\$ 1.22	\$ 48.09	\$ 49.32	1	\$ 58.14
	April	2009	\$ 6.18	\$ 39.54	\$ 45.72	4	\$ 10.69
	May	2009	\$ 15.00	\$ 37.09	\$ 52.08	10	\$ 5.02
	June	2009	\$ 29.92	\$ 52.64	\$ 82.57	21	\$ 3.89
	July	2009	\$ 20.33	\$ 50.27	\$ 70.60	16	\$ 4.54
	August	2009	\$ 18.92	\$ 56.81	\$ 75.73	15	\$ 5.05
	September	2009	\$ 19.51	\$ 50.52	\$ 70.03	15	\$ 4.53
	October	2009	\$ 24.75	\$ 54.34	\$ 79.09	20	\$ 4.03
	November	2009	\$ 21.35	\$ 53.89	\$ 75.24	17	\$ 4.44
	December	2009	\$ 8.56	\$ 45.92	\$ 54.48	7	\$ 8.03
	January	2010	\$ -	\$ 40.86	\$ 40.86	-	
	February	2010	\$ -	\$ 42.03	\$ 42.03	-	
	March	2010	\$ -	\$ 44.56	\$ 44.56	-	
	April	2010	\$ 3.23	\$ 42.83	\$ 46.06	3	\$ 17.97
	May	2010	\$ 11.98	\$ 51.50	\$ 63.48	9	\$ 6.68
	June	2010	\$ 15.32	\$ 48.91	\$ 64.22	13	\$ 4.92
	July	2010	\$ 15.77	\$ 50.81	\$ 66.57	15	\$ 4.42
	August	2010	\$ 7.75	\$ 30.04	\$ 37.79	8	\$ 4.73
Not Consecutive	September	2010	\$ -	\$ -	\$ -	-	#VALUE!

Month	Combined (Therms)
January	#VALUE!
February	#VALUE!
March	#VALUE!
April	3
May	10
June	17
July	15
August	15
September	16
October	20
November	17
December	7
Total	#VALUE!



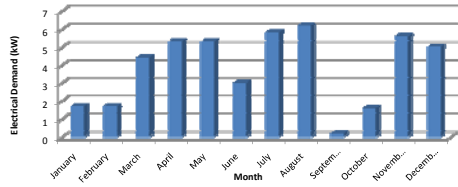
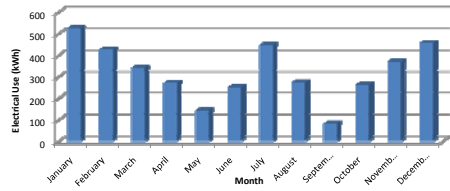
Electric Bills for Plots - Ski Lodge								
			CL & P Delivery Charges Ac # 51601063027 Meter # 820947252	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per KWH
Not Consecutive June-July Estimated Dec-Jan Estimated	March	2009	\$ 133.70	\$ -	\$ 133.70	663	0.6	\$ 0.20
	April	2009	\$ 172.05	\$ -	\$ 172.05	793	3.4	\$ 0.22
	May	2009	\$ 98.94	\$ -	\$ 98.94	357	2.6	\$ 0.28
	June	2009	\$ 70.45	\$ -	\$ 70.45	207	1.7	\$ 0.34
	July	2009	\$ 77.80	\$ -	\$ 77.80	239	2.3	\$ 0.33
	August	2009	\$ 82.57	\$ -	\$ 82.57	225	2.1	\$ 0.37
	September	2009	\$ 78.25	\$ -	\$ 78.25	218	3.3	\$ 0.36
	October	2009	\$ 147.65	\$ -	\$ 147.65	683	1.6	\$ 0.22
	November	2009	\$ 196.62	\$ -	\$ 196.62	1011	2.1	\$ 0.19
	December	2009	\$ 394.36	\$ -	\$ 394.36	1955	2.3	\$ 0.20
June-July Estimated Not Consecutive	January	2010	\$ 511.41	\$ -	\$ 511.41	2628	10.8	\$ 0.19
	February	2010	\$ 397.09	\$ -	\$ 397.09	2152	7.5	\$ 0.18
	March	2010	\$ 296.79	\$ -	\$ 296.79	1535	5.2	\$ 0.19
	April	2010	\$ 172.61	\$ -	\$ 172.61	761	4.4	\$ 0.23
	May	2010	\$ 121.74	\$ -	\$ 121.74	499	3.3	\$ 0.24
	June	2010	\$ 85.93	\$ -	\$ 85.93	317	2.4	\$ 0.27
	July	2010	\$ 68.49	\$ -	\$ 68.49	191	1.8	\$ 0.36
	August	2010	\$ 59.06	\$ -	\$ 59.06	139	1.7	\$ 0.43
	September	2010	\$ 26.86	\$ -	\$ 26.86	62	2.4	\$ 0.42

Month	Combined (KWH)	Demand (KW)
January	2628	11
February	2152	8
March	1535	5
April	777	4
May	428	3
June	262	2
July	215	2
August	182	2
September	218	3
October	683	2
November	1011	2
December	1955	2
Total	12046	



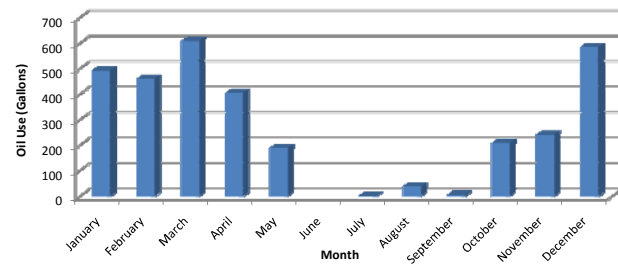
Electric Bills for Plots - Page Park Pavilion								
Comments	Month	Year	CL & P Delivery Charges Ac # 51502063019 Meter # 886958632	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ -81.60	\$ -	\$ -81.60	262	0.0	\$ -0.31
June-July Estimated	April	2009	\$ 129.46	\$ -	\$ 129.46	318	5.6	\$ 0.41
	May	2009	\$ 99.48	\$ -	\$ 99.48	139	6.0	\$ 0.72
	June	2009	\$ 120.90	\$ -	\$ 120.90	312	4.8	\$ 0.39
	July	2009	\$ 164.69	\$ -	\$ 164.69	512	5.4	\$ 0.32
	August	2009	\$ 104.82	\$ -	\$ 104.82	265	6.5	\$ 0.39
	September	2009	\$ 50.30	\$ -	\$ 50.30	81	0.2	\$ 0.62
	October	2009	\$ 101.05	\$ -	\$ 101.05	261	1.6	\$ 0.39
	November	2009	\$ 132.65	\$ -	\$ 132.65	369	5.6	\$ 0.36
	December	2009	\$ 125.83	\$ -	\$ 125.83	456	5.0	\$ 0.28
	Dec-Jan Estimated	2009	\$ 125.83	\$ -	\$ 125.83	456	5.0	\$ 0.28
June-July Estimated	January	2010	\$ 116.59	\$ -	\$ 116.59	525	1.7	\$ 0.22
	February	2010	\$ 112.14	\$ -	\$ 112.14	426	1.7	\$ 0.26
	March	2010	\$ 123.74	\$ -	\$ 123.74	340	4.4	\$ 0.36
	April	2010	\$ 102.80	\$ -	\$ 102.80	222	5.0	\$ 0.46
	May	2010	\$ 76.02	\$ -	\$ 76.02	147	4.6	\$ 0.52
	June	2010	\$ 90.01	\$ -	\$ 90.01	185	1.2	\$ 0.49
	July	2010	\$ 144.24	\$ -	\$ 144.24	381	6.2	\$ 0.38
	August	2010	\$ 102.21	\$ -	\$ 102.21	280	5.9	\$ 0.37
	September	2010	\$ 24.92	\$ -	\$ 24.92	43	0.6	\$ 0.58
Not Consecutive	September	2010	\$ 24.92	\$ -	\$ 24.92	43	0.6	\$ 0.58

Month	Combined (KWH)	Demand (KW)
January	525	2
February	426	2
March	340	4
April	270	5
May	143	5
June	249	3
July	446	6
August	273	6
September	81	0
October	261	2
November	369	6
December	456	5
Total	3839	



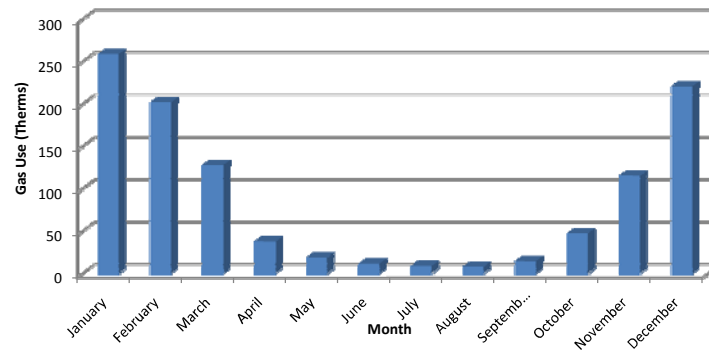
Oil Bills for Plots - Page Park Pavilion						
Comments	Month	Year	Buckley Delivery Charges Ac. # 1906-003 Meter # 886968632	Total Oil Charges	Total Gallons	Cost Per Gallon
	January	2007	\$ -	\$ -	10	\$ -
	February	2007	\$ -	\$ -	268	\$ -
	March	2007	\$ -	\$ -	578	\$ -
	April	2007	\$ -	\$ -	750	\$ -
	May	2007	\$ -	\$ -	0	\$ -
	June	2007	\$ -	\$ -	0	\$ -
	July	2007	\$ -	\$ -	4	\$ -
	August	2007	\$ -	\$ -	115	\$ -
	September	2007	\$ -	\$ -	0	\$ -
	October	2007	\$ -	\$ -	15	\$ -
	November	2007	\$ -	\$ -	451	\$ -
	December	2007	\$ -	\$ -	726	\$ -
	January	2008	\$ -	\$ -	616	\$ -
	February	2008	\$ -	\$ -	194	\$ -
	March	2008	\$ -	\$ -	604	\$ -
	April	2008	\$ -	\$ -	19	\$ -
	May	2008	\$ -	\$ -	561	\$ -
	June	2008	\$ -	\$ -	0	\$ -
	July	2008	\$ -	\$ -	0	\$ -
	August	2008	\$ -	\$ -	0	\$ -
	September	2008	\$ -	\$ -	10	\$ -
	October	2008	\$ -	\$ -	291	\$ -
	November	2008	\$ -	\$ -	17	\$ -
	December	2008	\$ -	\$ -	538	\$ -
	January	2009	\$ -	\$ -	636	\$ -
	February	2009	\$ -	\$ -	706	\$ -
	March	2009	\$ -	\$ -	691	\$ -
	April	2009	\$ -	\$ -	551	\$ -
	May	2009	\$ -	\$ -	4	\$ -
	June	2009	\$ -	\$ -	124	\$ -
	July	2009	\$ -	\$ -	0	\$ -
	August	2009	\$ -	\$ -	0	\$ -
	September	2009	\$ -	\$ -	10	\$ -
	October	2009	\$ -	\$ -	322	\$ -
	November	2009	\$ -	\$ -	253	\$ -
	December	2009	\$ -	\$ -	490	\$ -
	January	2010	\$ -	\$ -	714	\$ -
	February	2010	\$ -	\$ -	675	\$ -
	March	2010	\$ -	\$ -	566	\$ -
	April	2010	\$ -	\$ -	304	\$ -
	May	2010	\$ -	\$ -	194	\$ -

Month	Combined (Gallons)
January	494
February	461
March	609
April	406
May	190
June	
July	1
August	38
September	7
October	209
November	241
December	584
Total	3240



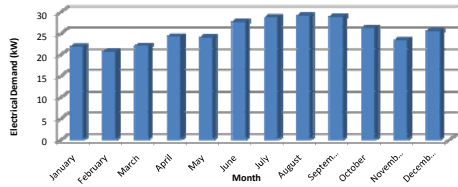
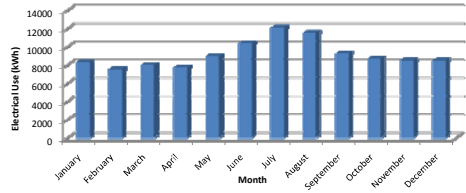
Gas Bills for Plots - Recreation Building							
Comments	Month	Year	Yankee Gas	Hess	Total Gas Charges	Total Therms	Cost Per Therm
			Delivery Charges Ac. # 011-740-0810000425611 Meter # 886968652	Supply Charges Ac. # 450344/468344			
Not Consecutive	July	2008	\$ 3.99	\$ 17.76	\$ 21.75	3	\$ 8.49
	August	2008	\$ 12.18	\$ 54.26	\$ 66.44	8	\$ 8.49
	September	2008	\$ 12.11	\$ 51.01	\$ 63.12	8	\$ 8.11
	October	2008	\$ 73.45	\$ 79.33	\$ 152.78	47	\$ 3.23
	November	2008	\$ 194.09	\$ 138.02	\$ 332.11	128	\$ 2.59
	December	2008	\$ 320.86	\$ 202.06	\$ 522.93	219	\$ 2.39
	January	2009	\$ 342.52	\$ 211.13	\$ 553.65	237	\$ 2.33
	February	2009	\$ 261.61	\$ 175.46	\$ 437.07	181	\$ 2.41
	March	2009	\$ 197.76	\$ 149.54	\$ 347.30	137	\$ 2.54
	April	2009	\$ 95.29	\$ 93.85	\$ 189.15	66	\$ 2.87
	May	2009	\$ 40.98	\$ 70.44	\$ 111.42	28	\$ 3.93
	June	2009	\$ 20.83	\$ 64.06	\$ 84.89	15	\$ 5.77
	July	2009	\$ 11.30	\$ 59.35	\$ 70.65	9	\$ 8.19
	August	2009	\$ 9.86	\$ 67.94	\$ 77.80	8	\$ 9.96
	September	2009	\$ 26.35	\$ 66.74	\$ 93.09	21	\$ 4.46
	October	2009	\$ 59.37	\$ 83.42	\$ 142.79	47	\$ 3.03
	November	2009	\$ 128.62	\$ 115.32	\$ 243.94	102	\$ 2.39
	December	2009	\$ 279.88	\$ 168.68	\$ 448.56	222	\$ 2.02
Not Consecutive	January	2010	\$ 352.62	\$ 192.09	\$ 544.71	280	\$ 1.95
	February	2010	\$ 280.17	\$ 173.25	\$ 453.41	222	\$ 2.04
	March	2010	\$ 149.21	\$ 125.29	\$ 274.50	118	\$ 2.32
	April	2010	\$ 10.75	\$ 59.96	\$ 70.71	9	\$ 8.30
	May	2010	\$ 11.13	\$ 66.61	\$ 77.74	9	\$ 8.81
	June	2010	\$ 9.54	\$ 60.18	\$ 69.72	8	\$ 8.69
	July	2010	\$ 8.55	\$ 61.40	\$ 69.95	8	\$ 8.52
	August	2010	\$ 4.77	\$ 37.06	\$ 41.83	5	\$ 8.50

Month	Combined (Therms)
January	258
February	202
March	128
April	37
May	19
June	11
July	8
August	8
September	14
October	47
November	115
December	220
Total	1068



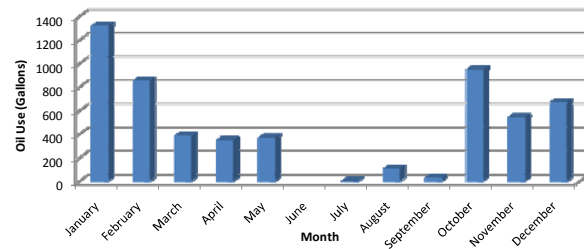
Electric Bills for Plots - Fire Dept Headquarters									
			CL & P Delivery Charges Ac # 51497553024 Meter # 820376902	0 Supply Charges Ac #					
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh	
Not Consecutive June-July Estimated	March	2009	\$ 711.75	\$ -	\$ 711.75	3213	0.0	\$ 0.19	
	April	2009	\$ 1,490.17	\$ -	\$ 1,490.17	7848	24.0	\$ 0.19	
	May	2009	\$ 1,720.50	\$ -	\$ 1,720.50	9096	23.4	\$ 0.19	
	June	2009	\$ 1,853.15	\$ -	\$ 1,853.15	9921	27.9	\$ 0.19	
	July	2009	\$ 2,092.23	\$ -	\$ 2,092.23	11412	26.8	\$ 0.18	
	August	2009	\$ 2,122.85	\$ -	\$ 2,122.85	11367	29.4	\$ 0.19	
	September	2009	\$ 1,306.33	\$ -	\$ 1,306.33	9230	28.8	\$ 0.14	
	October	2009	\$ 546.32	\$ -	\$ 546.32	8672	26.1	\$ 0.06	
	November	2009	\$ 519.35	\$ -	\$ 519.35	8481	23.2	\$ 0.06	
	December	2009	\$ 517.76	\$ -	\$ 517.76	8472	25.4	\$ 0.06	
	Dec-Jan Estimated June-July Estimated	January	2010	\$ 496.19	\$ -	\$ 496.19	8290	21.7	\$ 0.06
		February	2010	\$ 477.02	\$ -	\$ 477.02	7517	20.6	\$ 0.06
March		2010	\$ 523.94	\$ -	\$ 523.94	7988	21.9	\$ 0.07	
April		2010	\$ 514.02	\$ -	\$ 514.02	7594	24.2	\$ 0.07	
May		2010	\$ 599.90	\$ -	\$ 599.90	8823	24.3	\$ 0.07	
June		2010	\$ 661.35	\$ -	\$ 661.35	10796	27.2	\$ 0.06	
July		2010	\$ 740.60	\$ -	\$ 740.60	12757	30.4	\$ 0.06	
August		2010	\$ 717.14	\$ -	\$ 717.14	11625	28.6	\$ 0.06	
September		2010	\$ 376.74	\$ -	\$ 376.74	5590	20.4	\$ 0.07	
Not Consecutive									

Month	Combined (KWH)	Demand (KW)
January	8290	21
February	7517	21
March	7988	22
April	7721	24
May	8959	24
June	10359	28
July	12085	29
August	11496	29
September	9230	29
October	8672	26
November	8481	23
December	8472	25
Total	109269	



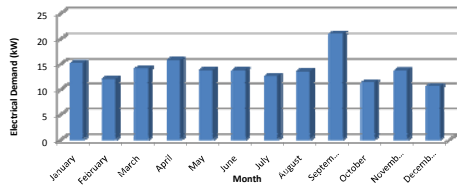
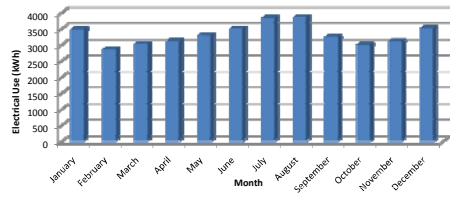
Oil Bills for Plots - Fire Headquarters							
Comments	Month	Year	Buckley Delivery Charges Ac. # 1904-000 Meter # 890376902	0 Supply Charges Ac. #	Total Oil Charges	Total Gallons	Cost Per Gallon
	January	2007	\$ -	\$ -	\$ -	69	\$ -
	February	2007	\$ -	\$ -	\$ -	1,931	\$ -
	March	2007	\$ -	\$ -	\$ -	927	\$ -
	April	2007	\$ -	\$ -	\$ -	772	\$ -
	May	2007	\$ -	\$ -	\$ -	0	#DIV/0!
	June	2007	\$ -	\$ -	\$ -	0	#DIV/0!
	July	2007	\$ -	\$ -	\$ -	11	\$ -
	August	2007	\$ -	\$ -	\$ -	318	\$ -
	September	2007	\$ -	\$ -	\$ -	0	#DIV/0!
	October	2007	\$ -	\$ -	\$ -	34	\$ -
	November	2007	\$ -	\$ -	\$ -	992	\$ -
	December	2007	\$ -	\$ -	\$ -	80	\$ -
	January	2008	\$ -	\$ -	\$ -	2,405	\$ -
	February	2008	\$ -	\$ -	\$ -	0	#DIV/0!
	March	2008	\$ -	\$ -	\$ -	0	#DIV/0!
	April	2008	\$ -	\$ -	\$ -	48	\$ -
	May	2008	\$ -	\$ -	\$ -	1,442	\$ -
	June	2008	\$ -	\$ -	\$ -	0	#DIV/0!
	July	2008	\$ -	\$ -	\$ -	0	#DIV/0!
	August	2008	\$ -	\$ -	\$ -	0	#DIV/0!
	September	2008	\$ -	\$ -	\$ -	64	\$ -
	October	2008	\$ -	\$ -	\$ -	1,925	\$ -
	November	2008	\$ -	\$ -	\$ -	36	\$ -
	December	2008	\$ -	\$ -	\$ -	1,112	\$ -
	January	2009	\$ -	\$ -	\$ -	1,343	\$ -
	February	2009	\$ -	\$ -	\$ -	1,083	\$ -
	March	2009	\$ -	\$ -	\$ -	0	#DIV/0!
	April	2009	\$ -	\$ -	\$ -	0	#DIV/0!
	May	2009	\$ -	\$ -	\$ -	37	\$ -
	June	2009	\$ -	\$ -	\$ -	1,063	\$ -
	July	2009	\$ -	\$ -	\$ -	0	#DIV/0!
	August	2009	\$ -	\$ -	\$ -	0	#DIV/0!
	September	2009	\$ -	\$ -	\$ -	29	\$ -
	October	2009	\$ -	\$ -	\$ -	891	\$ -
	November	2009	\$ -	\$ -	\$ -	606	\$ -
	December	2009	\$ -	\$ -	\$ -	823	\$ -
	January	2010	\$ -	\$ -	\$ -	1,466	\$ -
	February	2010	\$ -	\$ -	\$ -	406	\$ -
	March	2010	\$ -	\$ -	\$ -	616	\$ -
	April	2010	\$ -	\$ -	\$ -	580	\$ -
	May	2010	\$ -	\$ -	\$ -	0	#DIV/0!

Month	Combined (Gallons)
January	1321
February	855
March	386
April	350
May	370
June	
July	4
August	106
September	31
October	950
November	545
December	671
Total	5587



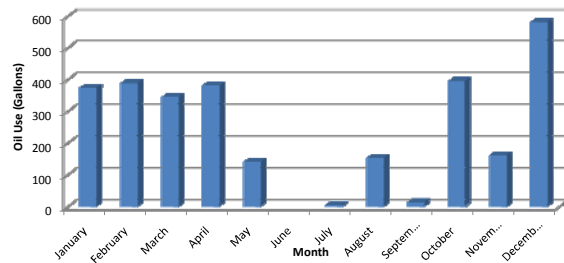
Electric Bills for Plots - Engine 2								
			CL & P Delivery Charges Ac # 51119853083 Meter # 821349582	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive June-July Estimated Dec-Jan Estimated	March	2008	\$ 379.92	\$ -	\$ 379.92	1723	9.6	\$ 0.21
	April	2008	\$ 711.60	\$ -	\$ 711.60	3381	18.3	\$ 0.21
	May	2008	\$ 705.21	\$ -	\$ 705.21	3356	12.9	\$ 0.21
	June	2008	\$ 697.86	\$ -	\$ 697.86	3328	16.9	\$ 0.21
	July	2008	\$ 717.06	\$ -	\$ 717.06	3553	12.9	\$ 0.20
	August	2008	\$ 805.66	\$ -	\$ 805.66	3767	14.4	\$ 0.21
	September	2008	\$ 554.41	\$ -	\$ 554.41	3242	20.9	\$ 0.17
	October	2008	\$ 245.49	\$ -	\$ 245.49	2999	11.3	\$ 0.08
	November	2008	\$ 236.78	\$ -	\$ 236.78	3096	13.6	\$ 0.08
December	2008	\$ 254.80	\$ -	\$ 254.80	3510	10.5	\$ 0.07	
June-July Estimated Not Consecutive	January	2009	\$ 271.95	\$ -	\$ 271.95	3473	15.1	\$ 0.08
	February	2009	\$ 244.02	\$ -	\$ 244.02	2850	12.0	\$ 0.09
	March	2009	\$ 267.34	\$ -	\$ 267.34	3015	14.0	\$ 0.09
	April	2009	\$ 252.73	\$ -	\$ 252.73	2825	13.1	\$ 0.09
	May	2009	\$ 274.63	\$ -	\$ 274.63	3213	14.6	\$ 0.09
	June	2009	\$ 250.36	\$ -	\$ 250.36	3661	10.4	\$ 0.07
	July	2009	\$ 280.31	\$ -	\$ 280.31	4083	12.1	\$ 0.07
	August	2009	\$ 291.51	\$ -	\$ 291.51	3932	12.6	\$ 0.07
	September	2009	\$ 162.74	\$ -	\$ 162.74	2118	9.6	\$ 0.08

Month	Combined (KWH)	Demand (KW)
January	3473	15
February	2850	12
March	3015	14
April	3103	16
May	3285	14
June	3495	14
July	3818	13
August	3849	14
September	3242	21
October	2999	11
November	3096	14
December	3510	11
Total	39734	



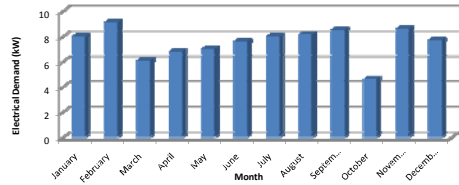
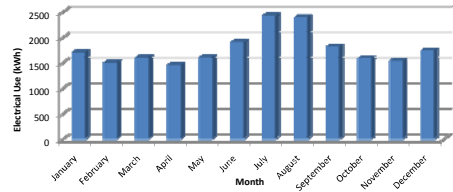
Oil Bills for Plots -						
Comments	Month	Year	Buckley Delivery Charges Ac. # 1904-001 Meter # 891340682	Total Oil Charges	Total Gallons	Cost Per Gallon
	January	2007	\$ -	\$ -	20	\$ -
	February	2007	\$ -	\$ -	572	\$ -
	March	2007	\$ -	\$ -	26	\$ -
	April	2007	\$ -	\$ -	758	\$ -
	May	2007	\$ -	\$ -	0	\$ -
	June	2007	\$ -	\$ -	0	\$ -
	July	2007	\$ -	\$ -	15	\$ -
	August	2007	\$ -	\$ -	458	\$ -
	September	2007	\$ -	\$ -	0	\$ -
	October	2007	\$ -	\$ -	10	\$ -
	November	2007	\$ -	\$ -	301	\$ -
	December	2007	\$ -	\$ -	476	\$ -
	January	2008	\$ -	\$ -	525	\$ -
	February	2008	\$ -	\$ -	21	\$ -
	March	2008	\$ -	\$ -	629	\$ -
	April	2008	\$ -	\$ -	19	\$ -
	May	2008	\$ -	\$ -	563	\$ -
	June	2008	\$ -	\$ -	0	\$ -
	July	2008	\$ -	\$ -	0	\$ -
	August	2008	\$ -	\$ -	0	\$ -
	September	2008	\$ -	\$ -	17	\$ -
	October	2008	\$ -	\$ -	504	\$ -
	November	2008	\$ -	\$ -	25	\$ -
	December	2008	\$ -	\$ -	755	\$ -
	January	2009	\$ -	\$ -	516	\$ -
	February	2009	\$ -	\$ -	544	\$ -
	March	2009	\$ -	\$ -	19	\$ -
	April	2009	\$ -	\$ -	554	\$ -
	May	2009	\$ -	\$ -	0	\$ -
	June	2009	\$ -	\$ -	0	\$ -
	July	2009	\$ -	\$ -	0	\$ -
	August	2009	\$ -	\$ -	0	\$ -
	September	2009	\$ -	\$ -	22	\$ -
	October	2009	\$ -	\$ -	674	\$ -
	November	2009	\$ -	\$ -	158	\$ -
	December	2009	\$ -	\$ -	511	\$ -
	January	2010	\$ -	\$ -	436	\$ -
	February	2010	\$ -	\$ -	417	\$ -
	March	2010	\$ -	\$ -	704	\$ -
	April	2010	\$ -	\$ -	198	\$ -
	May	2010	\$ -	\$ -	0	\$ -

Month	Combined (Gallons)
January	374
February	389
March	345
April	382
May	141
June	
July	5
August	153
September	13
October	396
November	161
December	581
Total	2940



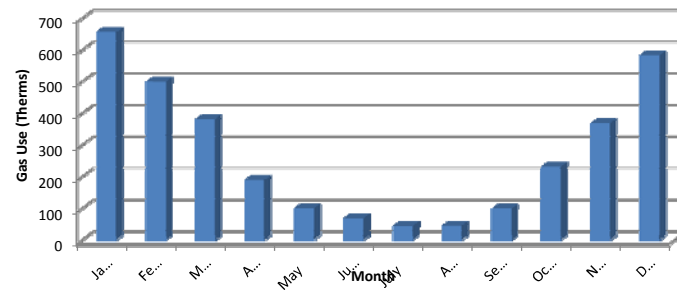
Electric Bills for Plots - Engine Co. 3								
			CL & P Delivery Charges Ac # 51656753068 Meter # 891420582	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2008	\$ 255.98	\$ -	\$ 255.98	1167	7.5	\$ 0.22
	April	2008	\$ 312.17	\$ -	\$ 312.17	1460	5.5	\$ 0.21
	May	2008	\$ 303.68	\$ -	\$ 303.68	1436	5.7	\$ 0.21
	June	2008	\$ 334.45	\$ -	\$ 334.45	1595	6.6	\$ 0.21
	July	2008	\$ 441.00	\$ -	\$ 441.00	2164	8.4	\$ 0.20
	August	2008	\$ 472.32	\$ -	\$ 472.32	2384	7.5	\$ 0.20
	September	2008	\$ 246.94	\$ -	\$ 246.94	1810	8.5	\$ 0.14
	October	2008	\$ 125.33	\$ -	\$ 125.33	1580	4.6	\$ 0.08
Dec-Jan Estimated	November	2008	\$ 141.83	\$ -	\$ 141.83	1532	8.6	\$ 0.09
	December	2008	\$ 157.88	\$ -	\$ 157.88	1736	7.7	\$ 0.09
Jan-Feb Estimated	January	2009	\$ 148.36	\$ -	\$ 148.36	1700	8.0	\$ 0.09
	February	2009	\$ 138.62	\$ -	\$ 138.62	1502	9.1	\$ 0.09
	March	2009	\$ 154.56	\$ -	\$ 154.56	1597	6.1	\$ 0.10
	April	2009	\$ 143.98	\$ -	\$ 143.98	1442	8.1	\$ 0.10
	May	2009	\$ 164.99	\$ -	\$ 164.99	1764	8.3	\$ 0.10
	June	2009	\$ 176.75	\$ -	\$ 176.75	2207	8.6	\$ 0.09
	July	2009	\$ 195.08	\$ -	\$ 195.08	2681	7.6	\$ 0.07
	August	2009	\$ 182.82	\$ -	\$ 182.82	2392	8.8	\$ 0.08
Not Consecutive	September	2009	\$ 79.46	\$ -	\$ 79.46	924	9.0	\$ 0.08

Month	Combined (KWH)	Demand (KW)
January	1700	8
February	1502	9
March	1597	6
April	1451	7
May	1600	7
June	1901	8
July	2422	8
August	2388	8
September	1810	9
October	1580	5
November	1532	9
December	1736	8
Total	21219	



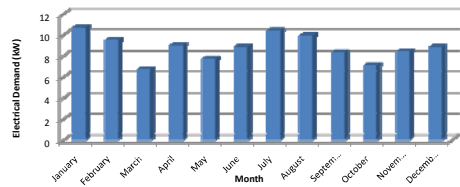
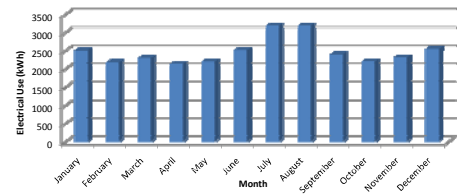
Gas Bills for Plots - Engine 3							
Comments	Month	Year	Yankee Gas Delivery Charges Ac. # 067-460-0220000429706	Hess Supply Charges Ac. # 450344/468401	Total Gas Charges	Total Therms	Cost Per Therm
			Meter # 891420582				
Not Consecutive	July	2008	\$ 57.16	\$ 54.23	\$ 111.39	37	\$ 3.03
	August	2008	\$ 107.53	\$ 101.51	\$ 209.03	69	\$ 3.02
	September	2008	\$ 147.48	\$ 122.31	\$ 269.79	95	\$ 2.84
	October	2008	\$ 371.18	\$ 207.13	\$ 578.30	239	\$ 2.42
	November	2008	\$ 625.32	\$ 288.23	\$ 913.55	411	\$ 2.22
	December	2008	\$ 894.59	\$ 380.53	\$ 1,275.12	610	\$ 2.09
	January	2009	\$ 1,028.87	\$ 430.62	\$ 1,459.49	713	\$ 2.05
	February	2009	\$ 818.24	\$ 353.48	\$ 1,171.72	567	\$ 2.07
	March	2009	\$ 647.41	\$ 311.69	\$ 959.11	448	\$ 2.14
	April	2009	\$ 307.45	\$ 196.80	\$ 504.25	213	\$ 2.37
	May	2009	\$ 166.66	\$ 144.72	\$ 311.39	115	\$ 2.70
	June	2009	\$ 136.20	\$ 134.25	\$ 270.45	97	\$ 2.80
	July	2009	\$ 62.44	\$ 115.10	\$ 177.54	47	\$ 3.79
	August	2009	\$ 27.26	\$ 99.02	\$ 126.29	22	\$ 5.84
	September	2009	\$ 128.92	\$ 138.04	\$ 266.96	102	\$ 2.61
	October	2009	\$ 281.23	\$ 209.96	\$ 491.20	223	\$ 2.20
	November	2009	\$ 408.92	\$ 248.30	\$ 657.22	324	\$ 2.03
	December	2009	\$ 700.86	\$ 316.80	\$ 1,017.65	556	\$ 1.83
	January	2010	\$ 757.46	\$ 331.66	\$ 1,089.12	601	\$ 1.81
	February	2010	\$ 544.84	\$ 261.39	\$ 806.23	432	\$ 1.87
	March	2010	\$ 395.79	\$ 230.47	\$ 626.25	314	\$ 2.00
	April	2010	\$ 209.62	\$ 170.02	\$ 379.64	166	\$ 2.28
	May	2010	\$ 106.93	\$ 124.31	\$ 231.24	85	\$ 2.73
	June	2010	\$ 48.02	\$ 96.22	\$ 144.24	40	\$ 3.60
	July	2010	\$ 42.23	\$ 102.66	\$ 144.89	41	\$ 3.53
	August	2010	\$ 17.27	\$ 41.21	\$ 58.49	18	\$ 3.28
Not Consecutive							

Month	Combined (Therms)
January	657
February	499
March	381
April	190
May	100
June	68
July	44
August	45
September	99
October	231
November	368
December	583
Total	3264



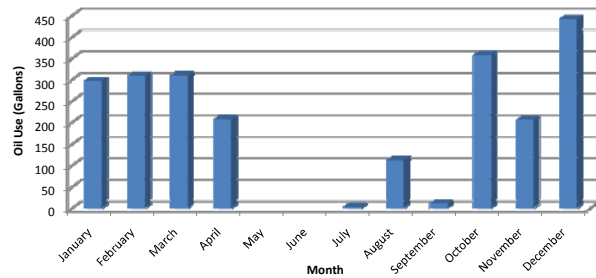
Electric Bills for Plots - Engine 4								
			CL & P Delivery Charges Ac # 51061163085 Meter # 00242006	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive June-July Estimated	March	2009	\$ 292.85	\$ -	\$ 292.85	1385	10.3	\$ 0.21
	April	2009	\$ 458.49	\$ -	\$ 458.49	2148	8.9	\$ 0.21
	May	2009	\$ 454.89	\$ -	\$ 454.89	2141	8.9	\$ 0.21
	June	2009	\$ 442.86	\$ -	\$ 442.86	2183	7.9	\$ 0.20
	July	2009	\$ 541.01	\$ -	\$ 541.01	2665	11.4	\$ 0.20
	August	2009	\$ 580.76	\$ -	\$ 580.76	2896	9.2	\$ 0.20
	September	2009	\$ 340.96	\$ -	\$ 340.96	2394	8.3	\$ 0.14
	October	2009	\$ 172.03	\$ -	\$ 172.03	2201	7.1	\$ 0.08
	November	2009	\$ 169.69	\$ -	\$ 169.69	2310	8.4	\$ 0.07
Dec-Jan Estimated	December	2009	\$ 179.56	\$ -	\$ 179.56	2544	8.8	\$ 0.07
Not Consecutive June-July Estimated	January	2010	\$ 206.07	\$ -	\$ 206.07	2497	10.7	\$ 0.08
	February	2010	\$ 187.08	\$ -	\$ 187.08	2176	9.5	\$ 0.09
	March	2010	\$ 177.53	\$ -	\$ 177.53	2298	6.7	\$ 0.08
	April	2010	\$ 173.75	\$ -	\$ 173.75	2115	9.1	\$ 0.08
	May	2010	\$ 173.14	\$ -	\$ 173.14	2261	6.5	\$ 0.08
	June	2010	\$ 193.67	\$ -	\$ 193.67	2836	9.8	\$ 0.07
	July	2010	\$ 243.82	\$ -	\$ 243.82	3687	9.4	\$ 0.07
	August	2010	\$ 235.56	\$ -	\$ 235.56	3468	10.6	\$ 0.07
	Not Consecutive	September	2010	\$ 102.50	\$ -	\$ 102.50	1450	9.9

Month	Combined (KWH)	Demand (KW)
January	2497	11
February	2176	10
March	2298	7
April	2131	9
May	2201	8
June	2510	9
July	3176	10
August	3182	10
September	2394	8
October	2201	7
November	2310	8
December	2544	9
Total	29620	



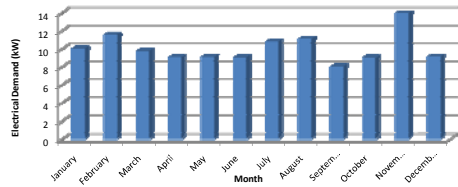
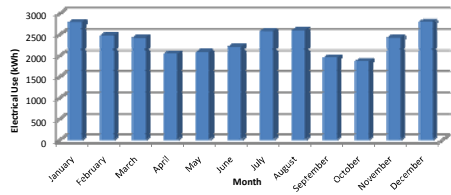
Oil Bills for Plots - Engine Co. 4						
Comments	Month	Year	Buckley	Total Oil Charges	Total Gallons	Cost Per Gallon
			Delivery Charges Ac. # 1904-002 Meter # 009242006			
	January	2007	\$ -	\$ -	14	\$ -
	February	2007	\$ -	\$ -	403	\$ -
	March	2007	\$ -	\$ -	18	\$ -
	April	2007	\$ -	\$ -	534	\$ -
	May	2007	\$ -	\$ -	0	
	June	2007	\$ -	\$ -	0	
	July	2007	\$ -	\$ -	11	\$ -
	August	2007	\$ -	\$ -	340	\$ -
	September	2007	\$ -	\$ -	0	
	October	2007	\$ -	\$ -	14	\$ -
	November	2007	\$ -	\$ -	419	\$ -
	December	2007	\$ -	\$ -	465	\$ -
	January	2008	\$ -	\$ -	399	\$ -
	February	2008	\$ -	\$ -	0	
	March	2008	\$ -	\$ -	0	
	April	2008	\$ -	\$ -	14	\$ -
	May	2008	\$ -	\$ -	405	\$ -
	June	2008	\$ -	\$ -	0	
	July	2008	\$ -	\$ -	0	
	August	2008	\$ -	\$ -	0	
	September	2008	\$ -	\$ -	17	\$ -
	October	2008	\$ -	\$ -	503	\$ -
	November	2008	\$ -	\$ -	19	\$ -
	December	2008	\$ -	\$ -	577	\$ -
	January	2009	\$ -	\$ -	385	\$ -
	February	2009	\$ -	\$ -	513	\$ -
	March	2009	\$ -	\$ -	517	\$ -
	April	2009	\$ -	\$ -	0	
	May	2009	\$ -	\$ -	0	
	June	2009	\$ -	\$ -	0	
	July	2009	\$ -	\$ -	0	
	August	2009	\$ -	\$ -	0	
	September	2009	\$ -	\$ -	18	\$ -
	October	2009	\$ -	\$ -	557	\$ -
	November	2009	\$ -	\$ -	182	\$ -
	December	2009	\$ -	\$ -	285	\$ -
	January	2010	\$ -	\$ -	391	\$ -
	February	2010	\$ -	\$ -	323	\$ -
	March	2010	\$ -	\$ -	707	\$ -
	April	2010	\$ -	\$ -	284	\$ -

Month	Combined (Gallons)
January	297
February	310
March	311
April	208
May	
June	
July	4
August	113
September	12
October	358
November	206
December	443
Total	2261



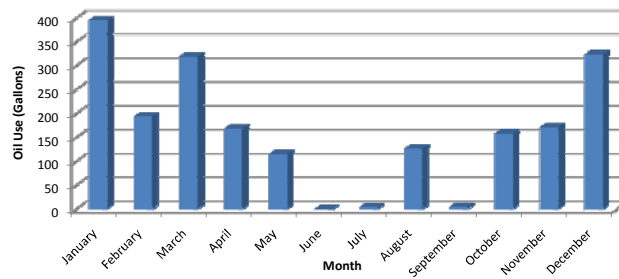
Electric Bills for Plots - Engine 5								
			CL & P Delivery Charges Ac # 51127063089 Meter # 891246982	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	February	2009	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
Not Consecutive	March	2009	\$ 317.02	\$ -	\$ 317.02	1476	9.4	\$ 0.21
	April	2009	\$ 420.91	\$ -	\$ 420.91	1981	9.2	\$ 0.21
	May	2009	\$ 421.58	\$ -	\$ 421.58	1938	9.1	\$ 0.22
June-July Estimated	June	2009	\$ 404.17	\$ -	\$ 404.17	1906	8.6	\$ 0.21
	July	2009	\$ 480.36	\$ -	\$ 480.36	2288	10.1	\$ 0.21
	August	2009	\$ 525.56	\$ -	\$ 525.56	2461	11.1	\$ 0.21
	September	2009	\$ 278.22	\$ -	\$ 278.22	1943	8.0	\$ 0.14
	October	2009	\$ 176.11	\$ -	\$ 176.11	1859	9.0	\$ 0.09
	November	2009	\$ 218.69	\$ -	\$ 218.69	2419	13.9	\$ 0.09
Dec-Jan Estimated	December	2009	\$ 203.82	\$ -	\$ 203.82	2794	9.1	\$ 0.07
	January	2010	\$ 213.25	\$ -	\$ 213.25	2783	10.0	\$ 0.08
	February	2010	\$ 210.87	\$ -	\$ 210.87	2469	11.5	\$ 0.09
	March	2010	\$ 207.37	\$ -	\$ 207.37	2419	9.7	\$ 0.09
	April	2010	\$ 184.81	\$ -	\$ 184.81	2098	8.9	\$ 0.09
	May	2010	\$ 191.62	\$ -	\$ 191.62	2217	9.0	\$ 0.09
June-July Estimated	June	2010	\$ 192.73	\$ -	\$ 192.73	2492	9.4	\$ 0.08
	July	2010	\$ 230.30	\$ -	\$ 230.30	2854	11.4	\$ 0.08
	August	2010	\$ 231.39	\$ -	\$ 231.39	2727	11.0	\$ 0.08
Not Consecutive	September	2010	\$ 72.43	\$ -	\$ 72.43	848	9.5	\$ 0.09

Month	Combined (KWH)	Demand (KW)
January	2783	10
February	2469	12
March	2419	10
April	2040	9
May	2078	9
June	2199	9
July	2571	11
August	2594	11
September	1943	8
October	1859	9
November	2419	14
December	2794	9
Total	28169	



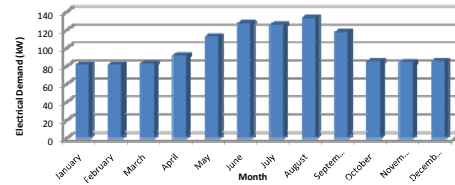
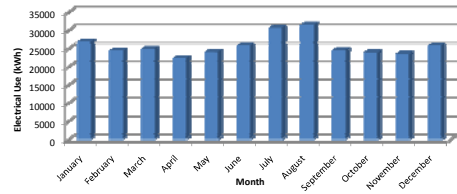
Oil Bills for Plots - Engine Co. 5						
Comments	Month	Year	Buckley Delivery Charges Ac. # 1904-003 Meter # 891246982	Total Oil Charges	Total Gallons	Cost Per Gallons
	January	2007	\$ -	\$ -	15	
	February	2007	\$ -	\$ -	408	
	March	2007	\$ -	\$ -	17	
	April	2007	\$ -	\$ -	503	
	May	2007	\$ -	\$ -	0	
	June	2007	\$ -	\$ -	0	
	July	2007	\$ -	\$ -	13	
	August	2007	\$ -	\$ -	381	
	September	2007	\$ -	\$ -	0	
	October	2007	\$ -	\$ -	12	
	November	2007	\$ -	\$ -	356	
	December	2007	\$ -	\$ -	20	
	January	2008	\$ -	\$ -	606	
	February	2008	\$ -	\$ -	18	
	March	2008	\$ -	\$ -	545	
	April	2008	\$ -	\$ -	13	
	May	2008	\$ -	\$ -	386	
	June	2008	\$ -	\$ -	0	
	July	2008	\$ -	\$ -	0	
	August	2008	\$ -	\$ -	0	
	September	2008	\$ -	\$ -	0	
	October	2008	\$ -	\$ -	0	
	November	2008	\$ -	\$ -	23	
	December	2008	\$ -	\$ -	707	
	January	2009	\$ -	\$ -	595	
	February	2009	\$ -	\$ -	15	
	March	2009	\$ -	\$ -	463	
	April	2009	\$ -	\$ -	0	
	May	2009	\$ -	\$ -	0	
	June	2009	\$ -	\$ -	0	
	July	2009	\$ -	\$ -	0	
	August	2009	\$ -	\$ -	0	
	September	2009	\$ -	\$ -	15	
	October	2009	\$ -	\$ -	464	
	November	2009	\$ -	\$ -	135	
	December	2009	\$ -	\$ -	244	
	January	2010	\$ -	\$ -	367	
	February	2010	\$ -	\$ -	334	
	March	2010	\$ -	\$ -	254	
	April	2010	\$ -	\$ -	158	
	May	2010	\$ -	\$ -	77	
	June	2010	\$ -	\$ -	0	

Month	Combined (Gallons)
January	396
February	194
March	320
April	168
May	116
June	0
July	4
August	127
September	5
October	159
November	171
December	324
Total	1983



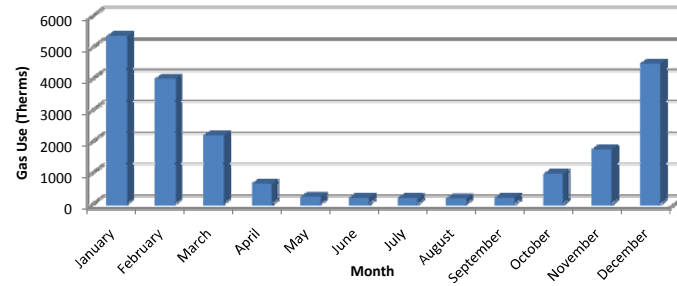
Electric Bills for Plots - Senior Center								
			CL & P Delivery Charges Ac # 51641753058 Meter # 883915872	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	January	2007	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
Not Consecutive	March	2009	\$ 1,374.07	\$ -	\$ 1,374.07	17710	81.1	\$ 0.08
	April	2009	\$ 1,919.34	\$ -	\$ 1,919.34	22365	110.6	\$ 0.09
	May	2009	\$ 2,065.44	\$ -	\$ 2,065.44	22805	99.0	\$ 0.09
	June	2009	\$ 1,928.33	\$ -	\$ 1,928.33	23360	109.9	\$ 0.08
	July	2009	\$ 2,175.66	\$ -	\$ 2,175.66	27978	121.8	\$ 0.08
	August	2009	\$ 2,345.76	\$ -	\$ 2,345.76	30795	130.4	\$ 0.08
	September	2009	\$ 2,255.58	\$ -	\$ 2,255.58	24427	116.8	\$ 0.09
	October	2009	\$ 2,085.49	\$ -	\$ 2,085.49	23906	85.0	\$ 0.09
	November	2009	\$ 1,759.04	\$ -	\$ 1,759.04	23468	83.7	\$ 0.07
	December	2009	\$ 1,777.50	\$ -	\$ 1,777.50	25764	85.1	\$ 0.07
	January	2010	\$ 2,001.46	\$ -	\$ 2,001.46	26833	81.1	\$ 0.07
	February	2010	\$ 1,854.76	\$ -	\$ 1,854.76	24285	80.8	\$ 0.08
	March	2010	\$ 1,927.46	\$ -	\$ 1,927.46	24804	82.1	\$ 0.08
	April	2010	\$ 1,861.01	\$ -	\$ 1,861.01	22190	71.7	\$ 0.08
	May	2010	\$ 2,214.01	\$ -	\$ 2,214.01	25124	125.0	\$ 0.09
	June	2010	\$ 2,365.30	\$ -	\$ 2,365.30	28187	143.5	\$ 0.08
	July	2010	\$ 2,588.43	\$ -	\$ 2,588.43	33250	128.3	\$ 0.08
	August	2010	\$ 2,558.64	\$ -	\$ 2,558.64	32121	134.9	\$ 0.08
Not Consecutive	September	2010	\$ -810.94	\$ -	\$ -810.94	9910	0.0	\$ -0.08

Month	Combined (KWH)	Demand (KW)
January	26833	81
February	24285	81
March	24804	82
April	22277	91
May	23964	112
June	25773	127
July	30614	125
August	31458	133
September	24427	117
October	23906	85
November	23468	84
December	25764	85
Total	307573	



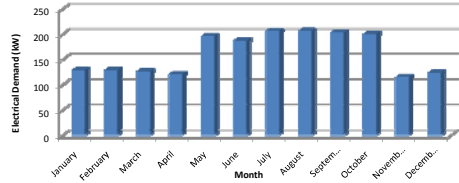
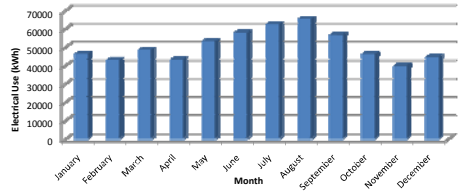
Gas Bills for Plots - Senior Center							
Comments	Month	Year	Yankee Gas	Hess	Total Gas Charges	Total Therms	Cost Per Therm
			Delivery Charges Ac. #	Supply Charges Ac. #			
			256-450-0650000356864	450344/454582			
			Meter #				
			889915822				
Not Consecutive	July	2008	\$ 8.28	\$ 24.81	\$ 33.09	5	\$ 6.22
	August	2008	\$ 257.27	\$ 770.11	\$ 1,027.37	165	\$ 6.21
	September	2008	\$ 304.10	\$ 777.21	\$ 1,081.31	196	\$ 5.53
	October	2008	\$ 1,459.98	\$ 1,001.04	\$ 2,461.02	939	\$ 2.62
	November	2008	\$ 3,184.51	\$ 1,290.53	\$ 4,475.04	2,058	\$ 2.17
	December	2008	\$ 6,539.54	\$ 1,677.94	\$ 8,217.48	4,529	\$ 1.81
	January	2009	\$ 8,037.91	\$ 1,807.61	\$ 9,845.52	5,567	\$ 1.77
	February	2009	\$ 5,777.75	\$ 1,620.45	\$ 7,398.20	4,002	\$ 1.85
	March	2009	\$ 3,680.04	\$ 1,433.47	\$ 5,113.50	2,549	\$ 2.01
	April	2009	\$ 1,358.12	\$ 993.39	\$ 2,351.51	941	\$ 2.50
	May	2009	\$ 363.16	\$ 835.22	\$ 1,198.39	251	\$ 4.76
	June	2009	\$ 321.54	\$ 829.93	\$ 1,151.47	223	\$ 5.15
	July	2009	\$ 248.90	\$ 825.71	\$ 1,074.61	197	\$ 5.45
	August	2009	\$ 192.14	\$ 821.60	\$ 1,013.74	152	\$ 6.66
	September	2009	\$ 238.77	\$ 830.87	\$ 1,069.64	189	\$ 5.65
	October	2009	\$ 1,179.00	\$ 950.17	\$ 2,129.17	935	\$ 2.28
	November	2009	\$ 1,746.57	\$ 1,002.20	\$ 2,748.77	1,385	\$ 1.99
	December	2009	\$ 5,549.55	\$ 1,347.08	\$ 6,896.63	4,400	\$ 1.57
Not Consecutive	January	2010	\$ 6,427.85	\$ 1,451.87	\$ 7,879.72	5,096	\$ 1.55
	February	2010	\$ 4,983.34	\$ 1,339.95	\$ 6,323.29	3,951	\$ 1.60
	March	2010	\$ 2,263.05	\$ 1,106.91	\$ 3,369.95	1,794	\$ 1.88
	April	2010	\$ 432.04	\$ 891.95	\$ 1,323.99	343	\$ 3.87
	May	2010	\$ 219.10	\$ 868.97	\$ 1,088.07	174	\$ 6.26
	June	2010	\$ 189.51	\$ 863.80	\$ 1,053.31	151	\$ 6.96
	July	2010	\$ 139.43	\$ 836.27	\$ 975.69	144	\$ 6.78
	August	2010	\$ 145.26	\$ 78.52	\$ 223.78	150	\$ 1.49

Month	Combined (Therms)
January	5331
February	3976
March	2171
April	642
May	213
June	187
July	171
August	159
September	192
October	937
November	1721
December	4465
Total	20165



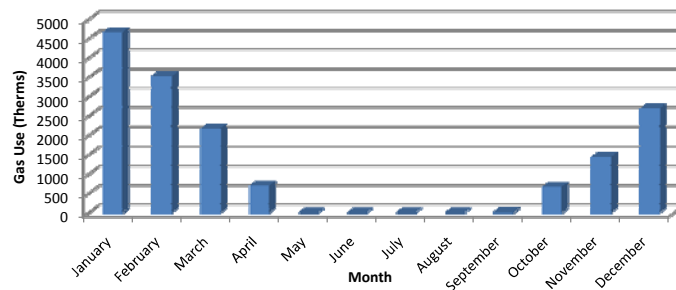
Electric Bills for Plots - Main Library								
Comments	Month	Year	CL & P Delivery Charges Ac # 51237924022 Meter # 891729172	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 1,356.88	\$ -	\$ 1,356.88	22320	0.0	\$ -0.06
	April	2009	\$ 2,928.18	\$ -	\$ 2,928.18	45425	128.3	\$ 0.06
July Estimated	May	2009	\$ 3,441.88	\$ -	\$ 3,441.88	53829	187.0	\$ 0.06
	June	2009	\$ 3,470.36	\$ -	\$ 3,470.36	58754	197.8	\$ 0.06
	July	2009	\$ 3,617.65	\$ -	\$ 3,617.65	62929	191.2	\$ 0.06
	August	2009	\$ 3,675.61	\$ -	\$ 3,675.61	67475	201.6	\$ 0.05
	September	2009	\$ 3,367.12	\$ -	\$ 3,367.12	56668	203.1	\$ 0.06
	October	2009	\$ 3,112.72	\$ -	\$ 3,112.72	46180	200.1	\$ 0.07
	November	2009	\$ 2,692.71	\$ -	\$ 2,692.71	39692	114.8	\$ 0.07
Dec-Feb Estimated	December	2009	\$ 2,716.47	\$ -	\$ 2,716.47	44481	123.3	\$ 0.06
Dec-Feb Estimated	January	2010	\$ 2,657.64	\$ -	\$ 2,657.64	46246	128.6	\$ 0.06
	February	2010	\$ 2,492.94	\$ -	\$ 2,492.94	42892	128.6	\$ 0.06
	March	2010	\$ 2,978.35	\$ -	\$ 2,978.35	48372	126.0	\$ 0.06
	April	2010	\$ 2,906.94	\$ -	\$ 2,906.94	41097	112.1	\$ 0.07
	May	2010	\$ 3,645.23	\$ -	\$ 3,645.23	52356	205.1	\$ 0.07
	June	2010	\$ 3,515.66	\$ -	\$ 3,515.66	56791	176.6	\$ 0.06
	July	2010	\$ 3,847.91	\$ -	\$ 3,847.91	61903	220.8	\$ 0.06
	August	2010	\$ 3,943.68	\$ -	\$ 3,943.68	63104	210.8	\$ 0.06
	September	2010	\$ 2,085.23	\$ -	\$ 2,085.23	32205	495.5	\$ -0.06
Not Consecutive								

Month	Combined (KWH)	Demand (KW)
January	46246	128
February	42892	129
March	48372	126
April	43261	120
May	53093	196
June	57773	187
July	62416	206
August	65290	206
September	56668	203
October	46180	200
November	39692	115
December	44481	123
Total	606363	



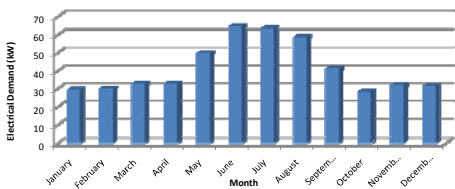
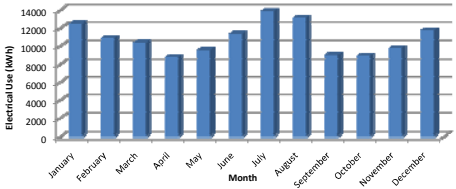
Gas Bills for Plots - Main Library							
			Yankee Gas Delivery Charges Ac. # 680-570- Meter # 891799122	Hess Supply Charges Ac. # 450344/501787			
Comments	Month	Year			Total Gas Charges	Total Therms	Cost Per Therm
Not Consecutive	February	2008	\$ 69.38	\$ 31.04	\$ 100.43	57	\$ 1.76
	March	2008	\$ 2,094.95	\$ 944.90	\$ 3,039.86	1,727	\$ 1.76
	April	2008	\$ 394.82	\$ 403.32	\$ 798.13	325	\$ 2.45
	May	2008	\$ 162.44	\$ 294.80	\$ 457.23	134	\$ 3.41
	June	2008	\$ -	\$ 218.15	\$ 218.15	-	
	July	2008	\$ -	\$ 218.38	\$ 218.38	-	
	August	2008	\$ -	\$ 218.61	\$ 218.61	-	
	September	2008	\$ 24.47	\$ 227.40	\$ 251.87	16	\$ 16.00
	October	2008	\$ 810.73	\$ 518.93	\$ 1,329.66	521	\$ 2.55
	November	2008	\$ 2,337.53	\$ 907.54	\$ 3,245.08	1,509	\$ 2.15
	December	2008	\$ 3,782.72	\$ 1,154.11	\$ 4,936.84	2,620	\$ 1.88
	January	2009	\$ 6,726.48	\$ 1,732.88	\$ 8,459.36	4,659	\$ 1.82
	February	2009	\$ 5,096.41	\$ 1,489.66	\$ 6,586.07	3,530	\$ 1.87
	March	2009	\$ 3,752.09	\$ 1,296.67	\$ 5,048.76	2,599	\$ 1.94
	April	2009	\$ 1,525.23	\$ 966.92	\$ 2,492.14	1,056	\$ 2.36
	May	2009	\$ -	\$ 658.79	\$ 658.79	-	
	June	2009	\$ -	\$ 657.37	\$ 657.37	-	
	July	2009	\$ -	\$ 658.08	\$ 658.08	-	
	August	2009	\$ -	\$ 658.79	\$ 658.79	-	
	September	2009	\$ 31.91	\$ 665.37	\$ 697.28	25	\$ 27.57
	October	2009	\$ 1,012.67	\$ 910.52	\$ 1,923.18	803	\$ 2.40
	November	2009	\$ 1,719.47	\$ 1,016.69	\$ 2,736.16	1,363	\$ 2.01
	December	2009	\$ 3,493.71	\$ 1,203.54	\$ 4,697.25	2,770	\$ 1.70
Not Consecutive	January	2010	\$ 3,839.97	\$ 1,082.56	\$ 4,922.54	3,044	\$ 1.62

Month	Combined (Therms)
January	4659
February	3530
March	2163
April	691
May	0
June	0
July	0
August	0
September	21
October	662
November	1436
December	2695
Total	15856



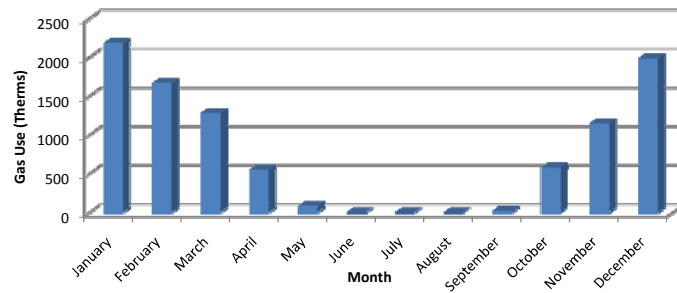
Electric Bills for Plots - Public Library							
Comments	Month	Year	CL & P Delivery Charges Ac # 51509953055 Meter # 890380732	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand
Not Consecutive Not Consecutive	February	2009	\$ -	\$ -	\$ -	0	0.0
	March	2009	\$ 376.04	\$ -	\$ 376.04	5670	30.4
	April	2009	\$ 604.29	\$ -	\$ 604.29	8713	27.7
	May	2009	\$ 714.18	\$ -	\$ 714.18	8177	45.5
	June	2009	\$ 861.42	\$ -	\$ 861.42	9142	59.6
	July	2009	\$ 1,050.87	\$ -	\$ 1,050.87	11573	62.8
	August	2009	\$ 1,026.83	\$ -	\$ 1,026.83	11603	56.6
	September	2009	\$ 809.21	\$ -	\$ 809.21	8987	41.0
	October	2009	\$ 680.56	\$ -	\$ 680.56	8889	28.2
	November	2009	\$ 632.46	\$ -	\$ 632.46	9744	31.8
	December	2009	\$ 683.80	\$ -	\$ 683.80	11709	31.3
Not Consecutive	January	2010	\$ 734.87	\$ -	\$ 734.87	12482	29.2
	February	2010	\$ 657.22	\$ -	\$ 657.22	10870	29.8
	March	2010	\$ 689.95	\$ -	\$ 689.95	10353	32.5
	April	2010	\$ 693.86	\$ -	\$ 693.86	8722	37.3
	May	2010	\$ 886.23	\$ -	\$ 886.23	10853	53.4
	June	2010	\$ 1,127.84	\$ -	\$ 1,127.84	13513	69.4
	July	2010	\$ 1,323.90	\$ -	\$ 1,323.90	16145	63.8
	August	2010	\$ 1,176.32	\$ -	\$ 1,176.32	14608	60.2
	September	2010	\$ 489.19	\$ -	\$ 489.19	6607	9.6

Month	Combined (KWH)	Demand (KW)
January	12482	29
February	10870	30
March	10353	33
April	8718	33
May	9515	49
June	11327	65
July	13859	63
August	13105	58
September	8987	41
October	8889	28
November	9744	32
December	11709	31
Total	129559	



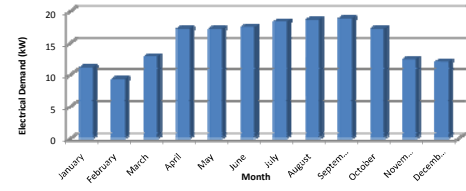
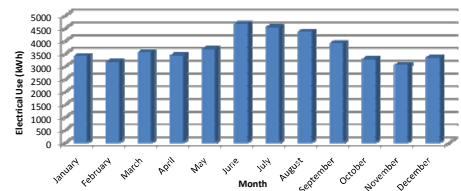
Gas Bills for Plots - Public Library							
Comments	Month	Year	Yankee Gas	Hess	Total Gas Charges	Total Therms	Cost Per Therm
			Delivery Charges Ac. # 354-460-0570000465862	Supply Charges Ac. # 450344/454586			
			Meter # 890390732				
Not Consecutive	July	2008	\$ 1.59	\$ 6.13	\$ 7.72	1	\$ 7.53
	August	2008	\$ 47.82	\$ 189.59	\$ 237.41	31	\$ 7.72
	September	2008	\$ 26.48	\$ 181.20	\$ 207.68	17	\$ 12.20
	October	2008	\$ 856.28	\$ 492.57	\$ 1,348.85	551	\$ 2.45
	November	2008	\$ 1,877.92	\$ 795.77	\$ 2,673.69	1,212	\$ 2.21
	December	2008	\$ 2,591.50	\$ 912.56	\$ 3,504.07	1,795	\$ 1.95
	January	2009	\$ 3,194.26	\$ 1,002.44	\$ 4,196.70	2,212	\$ 1.90
	February	2009	\$ 2,205.87	\$ 854.41	\$ 3,060.27	1,528	\$ 2.00
	March	2009	\$ 2,035.89	\$ 827.78	\$ 2,863.67	1,410	\$ 2.03
	April	2009	\$ 935.12	\$ 539.70	\$ 1,474.81	648	\$ 2.28
	May	2009	\$ 67.32	\$ 284.95	\$ 352.26	47	\$ 7.56
	June	2009	\$ -	\$ 269.32	\$ 269.32	-	#VALUE!
	July	2009	\$ -	\$ 269.61	\$ 269.61	-	#VALUE!
	August	2009	\$ -	\$ 269.90	\$ 269.90	-	#VALUE!
	September	2009	\$ 23.82	\$ 275.29	\$ 299.11	19	\$ 15.84
	October	2009	\$ 758.31	\$ 459.52	\$ 1,217.83	601	\$ 2.03
	November	2009	\$ 1,359.20	\$ 589.95	\$ 1,949.14	1,078	\$ 1.81
	December	2009	\$ 2,731.15	\$ 738.25	\$ 3,469.41	2,165	\$ 1.60
	January	2010	\$ 2,703.49	\$ 752.63	\$ 3,456.11	2,143	\$ 1.61
	February	2010	\$ 2,266.77	\$ 702.55	\$ 2,969.33	1,797	\$ 1.65
	March	2010	\$ 1,446.75	\$ 613.36	\$ 2,060.11	1,147	\$ 1.80
	April	2010	\$ 559.64	\$ 421.35	\$ 980.99	444	\$ 2.21
	May	2010	\$ 141.40	\$ 320.49	\$ 461.89	112	\$ 4.12
	June	2010	\$ -	\$ 285.57	\$ 285.57	-	#VALUE!
	July	2010	\$ -	\$ 285.88	\$ 285.88	-	#VALUE!

Month	Combined (Therms)
January	2178
February	1662
March	1278
April	546
May	79
June	0
July	0
August	0
September	18
October	576
November	1145
December	1980
Total	9462



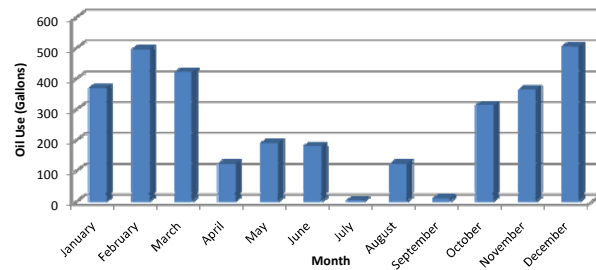
Electric Bills for Plots - Youth Services							
Comments	Month	Year	CL & P Delivery Charges Ac # 51736653049 Meter # 890802462	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand
Not Consecutive	March	2009	\$ 21.83	\$ -	\$ 21.83	94	0.0
	April	2009	\$ 327.25	\$ -	\$ 327.25	1402	19.1
	May	2009	\$ 797.52	\$ -	\$ 797.52	3621	19.1
June-July Estimated	June	2009	\$ 1,044.50	\$ -	\$ 1,044.50	5420	16.7
	July	2009	\$ 957.29	\$ -	\$ 957.29	4742	18.0
	August	2009	\$ 972.86	\$ -	\$ 972.86	4697	19.2
	September	2009	\$ 830.02	\$ -	\$ 830.02	3901	18.8
	October	2009	\$ 698.36	\$ -	\$ 698.36	3261	17.2
	November	2009	\$ 622.96	\$ -	\$ 622.96	3042	12.4
Dec-Jan Estimated	December	2009	\$ 652.25	\$ -	\$ 652.25	3327	12.0
	January	2010	\$ 637.58	\$ -	\$ 637.58	3395	11.1
	February	2010	\$ 600.37	\$ -	\$ 600.37	3164	9.3
	March	2010	\$ 700.84	\$ -	\$ 700.84	3550	12.8
	April	2010	\$ 690.69	\$ -	\$ 690.69	3425	15.3
	May	2010	\$ 770.89	\$ -	\$ 770.89	3721	15.3
June-July Estimated	June	2010	\$ 798.10	\$ -	\$ 798.10	3900	18.2
	July	2010	\$ 863.95	\$ -	\$ 863.95	4307	18.6
	August	2010	\$ 826.68	\$ -	\$ 826.68	4007	18.0
Not Consecutive	September	2010	\$ 422.92	\$ -	\$ 422.92	1984	18.3

Month	Combined (KWH)	Demand (KW)
January	3395	11
February	3164	9
March	3550	13
April	3425	17
May	3671	17
June	4660	17
July	4524	18
August	4352	19
September	3901	19
October	3261	17
November	3042	12
December	3327	12
Total	44272	



Oil Bills for Plots - Youth Services					
Comments	Month	Year	Buckley Delivery Charges Ac. # 1905-004 Meter # 890802462	Total Oil Charges	Total Gallons
	January	2007	\$ -	\$ -	19
	February	2007	\$ -	\$ -	545
	March	2007	\$ -	\$ -	412
	April	2007	\$ -	\$ -	219
	May	2007	\$ -	\$ -	8
	June	2007	\$ -	\$ -	227
	July	2007	\$ -	\$ -	12
	August	2007	\$ -	\$ -	366
	September	2007	\$ -	\$ -	0
	October	2007	\$ -	\$ -	17
	November	2007	\$ -	\$ -	514
	December	2007	\$ -	\$ -	672
	January	2008	\$ -	\$ -	431
	February	2008	\$ -	\$ -	695
	March	2008	\$ -	\$ -	425
	April	2008	\$ -	\$ -	9
	May	2008	\$ -	\$ -	283
	June	2008	\$ -	\$ -	216
	July	2008	\$ -	\$ -	0
	August	2008	\$ -	\$ -	0
	September	2008	\$ -	\$ -	18
	October	2008	\$ -	\$ -	568
	November	2008	\$ -	\$ -	416
	December	2008	\$ -	\$ -	523
	January	2009	\$ -	\$ -	511
	February	2009	\$ -	\$ -	279
	March	2009	\$ -	\$ -	489
	April	2009	\$ -	\$ -	8
	May	2009	\$ -	\$ -	253
	June	2009	\$ -	\$ -	278
	July	2009	\$ -	\$ -	0
	August	2009	\$ -	\$ -	0
	September	2009	\$ -	\$ -	12
	October	2009	\$ -	\$ -	355
	November	2009	\$ -	\$ -	162
	December	2009	\$ -	\$ -	316
	January	2010	\$ -	\$ -	515
	February	2010	\$ -	\$ -	461
	March	2010	\$ -	\$ -	359
	April	2010	\$ -	\$ -	254
	May	2010	\$ -	\$ -	220
	June	2010	\$ -	\$ -	0

Month	Combined (Gallons)
January	369
February	495
March	421
April	123
May	191
June	181
July	4
August	122
September	10
October	313
November	364
December	504
Total	3097

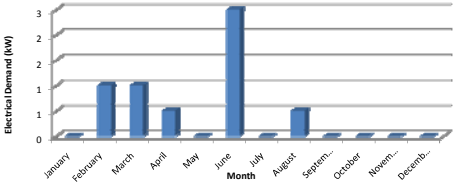
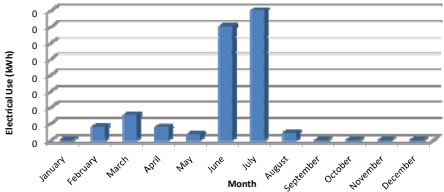


Gas Bills for Plots - Animal Control							
Comments	Month	Year	Yankee Gas	Hess	Total Gas Charges	Total Therms	Cost Per Therm
			Delivery Charges Ac. # 899-170-0960000420591 Meter # 890447442	Supply Charges Ac. # 450344/468402			
Not Consecutive	July	2008	\$ 32.54	\$ 40.95	\$ 73.48	21	\$ 3.51
	August	2008	\$ 62.53	\$ 77.23	\$ 139.75	40	\$ 3.48
	September	2008	\$ 65.20	\$ 79.41	\$ 144.62	42	\$ 3.45
	October	2008	\$ 126.48	\$ 106.82	\$ 233.30	81	\$ 2.87
	November	2008	\$ 322.15	\$ 185.53	\$ 507.68	212	\$ 2.39
	December	2008	\$ 478.83	\$ 250.90	\$ 729.72	326	\$ 2.24
	January	2009	\$ 545.66	\$ 278.31	\$ 823.97	378	\$ 2.18
	February	2009	\$ 491.49	\$ 249.93	\$ 741.41	340	\$ 2.18
	March	2009	\$ 446.34	\$ 246.93	\$ 693.27	309	\$ 2.24
	April	2009	\$ 297.55	\$ 194.27	\$ 491.83	206	\$ 2.39
	May	2009	\$ 136.31	\$ 120.66	\$ 256.97	94	\$ 2.72
	June	2009	\$ 48.54	\$ 80.95	\$ 129.49	35	\$ 3.74
	July	2009	\$ 44.90	\$ 88.07	\$ 132.97	34	\$ 3.86
	August	2009	\$ 41.88	\$ 85.96	\$ 127.84	33	\$ 3.85
	September	2009	\$ 40.80	\$ 80.36	\$ 121.16	32	\$ 3.75
	October	2009	\$ 72.84	\$ 101.23	\$ 174.06	58	\$ 3.01
	November	2009	\$ 166.44	\$ 142.99	\$ 309.43	132	\$ 2.34
	December	2009	\$ 381.70	\$ 206.62	\$ 588.32	303	\$ 1.94
	January	2010	\$ 460.03	\$ 233.91	\$ 693.94	365	\$ 1.90
	February	2010	\$ 358.59	\$ 197.85	\$ 556.44	284	\$ 1.96
	March	2010	\$ 269.20	\$ 175.54	\$ 444.75	213	\$ 2.08
	April	2010	\$ 142.97	\$ 127.71	\$ 270.67	113	\$ 2.39
	May	2010	\$ 70.80	\$ 95.36	\$ 166.17	56	\$ 2.96
	June	2010	\$ 32.87	\$ 76.78	\$ 109.65	27	\$ 3.99
	July	2010	\$ 25.73	\$ 80.26	\$ 105.99	25	\$ 4.29
	August	2010	\$ 9.05	\$ 31.30	\$ 40.35	9	\$ 4.32
Not Consecutive							

Month	Combined (Therms)
January	371
February	312
March	261
April	160
May	75
June	31
July	30
August	37
September	37
October	70
November	172
December	314
Total	1870

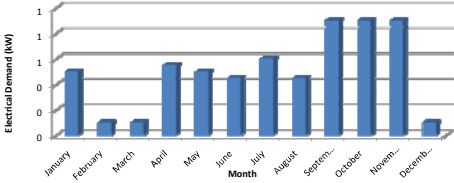
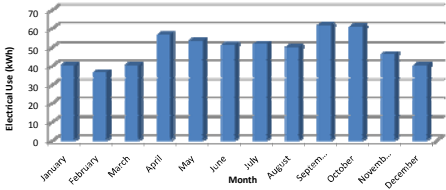
Electric Bills for Plots - Community Services								
Comments	Month	Year	CL & P	0	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
			Delivery Charges Ac # 51330163072 Meter # 882345722	Supply Charges Ac #				
Not Consecutive	March	2009	\$ 21.66	\$ -	\$ 21.66	0.00	0.0	#DIV/0!
	April	2009	\$ 38.09	\$ -	\$ 38.09	0.00	0.0	#DIV/0!
	May	2009	\$ 37.64	\$ -	\$ 37.64	0.00	0.0	#DIV/0!
June-July Estimated	June	2009	\$ 36.73	\$ -	\$ 36.73	0.28	5.0	\$ 131.17
	July	2009	\$ 41.18	\$ -	\$ 41.18	0.32	0.0	\$ 128.70
	August	2009	\$ 39.70	\$ -	\$ 39.70	0.00	0.0	#DIV/0!
	September	2009	\$ 36.64	\$ -	\$ 36.64	0.00	0.0	#DIV/0!
	October	2009	\$ 40.64	\$ -	\$ 40.64	0.00	0.0	#DIV/0!
	November	2009	\$ 41.01	\$ -	\$ 41.01	0.00	0.0	#DIV/0!
Dec-Jan Estimated	December	2009	\$ 23.93	\$ -	\$ 23.93	0.00	0.0	#DIV/0!
	January	2010	\$ 29.10	\$ -	\$ 29.10	0.00	0.0	#DIV/0!
	February	2010	\$ 35.88	\$ -	\$ 35.88	0.02	1.0	\$ 2,317.21
	March	2010	\$ 39.31	\$ -	\$ 39.31	0.03	1.0	\$ 1,288.33
	April	2010	\$ 39.36	\$ -	\$ 39.36	0.03	1.0	\$ 1,288.33
	May	2010	\$ 38.98	\$ -	\$ 38.98	0.01	0.0	\$ 2,898.67
June-July Estimated	June	2010	\$ 37.38	\$ -	\$ 37.38	0.00	0.0	#DIV/0!
	July	2010	\$ 40.54	\$ -	\$ 40.54	0.00	0.0	#DIV/0!
	August	2010	\$ 38.18	\$ -	\$ 38.18	0.02	1.0	\$ 2,210.66
Not Consecutive	September	2010	\$ 16.40	\$ -	\$ 16.40	0	0.0	\$ 1,288.33
Not Consecutive	October	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
Not Consecutive	November	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
Not Consecutive	December	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!

Month	Combingd (KWH)	Demand (KW)
January	0	0
February	0	1
March	0	1
April	0	1
May	0	0
June	0	3
July	0	0
August	0	1
September	0	0
October	0	0
November	0	0
December	0	0
Total	0.4	



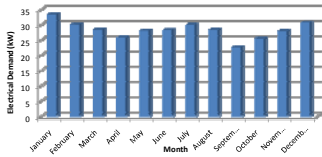
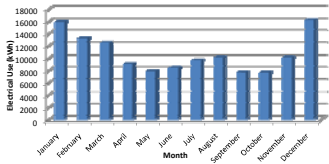
Electric Bills for Plots - Hill Street								
			CL & P Delivery Charges Ac # 51466874062	0 Supply Charges Ac #				
Comments	Month	Year	Meter # 820811832		Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 29.82	\$ -	\$ 29.82	40	0.5	\$ 0.75
	April	2009	\$ 59.22	\$ -	\$ 59.22	74	1.0	\$ 0.80
	May	2009	\$ 60.91	\$ -	\$ 60.91	67	0.9	\$ 0.91
	June	2009	\$ 57.40	\$ -	\$ 57.40	62	0.8	\$ 0.93
	July	2009	\$ 58.49	\$ -	\$ 58.49	61	0.9	\$ 0.96
	August	2009	\$ 61.58	\$ -	\$ 61.58	60	0.8	\$ 1.02
	September	2009	\$ 56.39	\$ -	\$ 56.39	62	0.9	\$ 0.91
	October	2009	\$ 53.07	\$ -	\$ 53.07	61	0.9	\$ 0.87
	November	2009	\$ 49.62	\$ -	\$ 49.62	46	0.9	\$ 1.08
	December	2009	\$ 48.88	\$ -	\$ 48.88	40	0.1	\$ 1.22
	January	2010	\$ 48.86	\$ -	\$ 48.86	40	0.5	\$ 1.21
	February	2010	\$ 48.30	\$ -	\$ 48.30	36	0.1	\$ 1.33
Not Consecutive	March	2010	\$ 50.90	\$ -	\$ 50.90	40	0.1	\$ 1.26
	April	2010	\$ 48.40	\$ -	\$ 48.40	40	0.1	\$ 1.22
	May	2010	\$ 53.79	\$ -	\$ 53.79	40	0.1	\$ 1.34
	June	2010	\$ 48.91	\$ -	\$ 48.91	40	0.1	\$ 1.21
	July	2010	\$ 50.01	\$ -	\$ 50.01	42	0.3	\$ 1.19
	August	2010	\$ 51.73	\$ -	\$ 51.73	39	0.1	\$ 1.32
	September	2010	\$ 28.32	\$ -	\$ 28.32	22	0.5	\$ 1.32

Month	Combined (KWH)	Demand (KW)
January	40	1
February	36	0
March	40	0
April	57	1
May	53	1
June	51	0
July	52	1
August	50	0
September	62	1
October	61	1
November	46	1
December	40	0
Total	588	



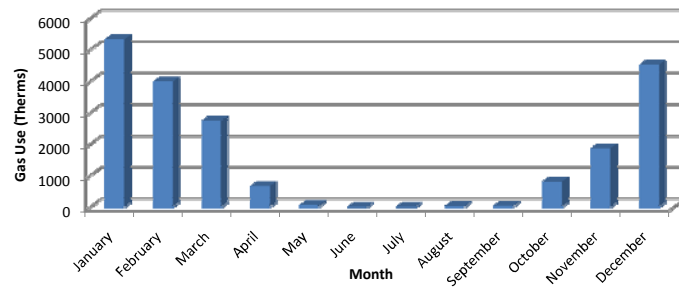
Electric Bills for Plots - City Yard														
			CL & P Delivery Charges Ac # 51952163004 Meter # 891240112	CL & P Delivery Charges Ac # 51460993017 Meter # 890126452	CL & P Delivery Charges Ac # 51330163072 Meter # 887245722	CL & P Delivery Charges Ac # 51004493094 Meter # 890147448								
Comments	Month	Year					Total Electric Charges	51952163004 kWh	51460993017 kWh	51330163072 kWh	51004493094 kWh	Total kWh	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 112.78	\$ -	\$ -	\$ 112.78	1406				2021	2426	23.4	\$ 0.08
	April	2009	\$ 144.08	\$ 22.35	\$ 22.35	\$ 394.90	166.44		0	0	3871	5478	23.4	\$ 0.10
May Estimated	May	2009	\$ 122.13	\$ 39.25	\$ 36.53	\$ 439.68	161.38	1263		0	4865	6129	28.8	\$ 0.13
June-July Estimated	June	2009	\$ 104.41	\$ 36.40	\$ 36.73	\$ 479.82	140.81	1169		4	6108	7281	24.3	\$ 0.12
	July	2009	\$ 107.68	\$ 38.74	\$ 41.18	\$ 598.29	146.42	1173		5	8253	9431	29.9	\$ 0.12
	August	2009	\$ 104.79	\$ 38.91	\$ 39.70	\$ 566.38	143.71	1032		0	7808	8840	28.3	\$ 0.14
	September	2009	\$ 115.85	\$ 38.09	\$ 36.64	\$ 479.65	153.93	1141		0	6529	7670	22.6	\$ 0.13
	October	2009	\$ 149.91	\$ 42.01	\$ 40.64	\$ 443.07	191.92	1580		0	6066	7647	25.4	\$ 0.12
	November	2009	\$ 163.53	\$ 38.69	\$ 41.01	\$ 502.68	202.22	2172		0	7903	10075	27.8	\$ 0.09
Dec-Jan Estimated	December	2009	\$ 252.22	\$ 38.05	\$ 37.25	\$ 670.56	290.27	4286	7	0	11876	16170	30.6	\$ 0.07
	January	2010	\$ 284.20	\$ 40.76	\$ 38.42	\$ 733.19	324.96	4369	10	0	11524	15903	33.4	\$ 0.07
	February	2010	\$ 224.57	\$ 35.81	\$ 35.88	\$ 651.83	260.38	3256	5	1	9975	13236	30.1	\$ 0.08
	March	2010	\$ 184.17	\$ 38.58	\$ 39.31	\$ 654.57	222.75	2484	2	1	9971	12458	28.4	\$ 0.09
	April	2010	\$ 129.64	\$ 39.21	\$ 39.36	\$ 599.04	168.85	1306		0	8269	9576	28.2	\$ 0.13
	May	2010	\$ 117.68	\$ 38.91	\$ 38.98	\$ 590.37	156.59	1121		0	8303	9424	27.3	\$ 0.14
June-July Estimated	June	2010	\$ 103.83	\$ 37.38	\$ 37.38	\$ 616.63	141.20	940		0	8772	9712	32.0	\$ 0.15
	July	2010	\$ 106.16	\$ 40.54	\$ 40.54	\$ 706.62	148.69	950		0	10371	11321	29.8	\$ 0.16
	August	2010	\$ 106.22	\$ 38.10	\$ 38.18	\$ 640.82	144.32	980		1	9672	10653	28.2	\$ 0.15
Not Consecutive	September	2010	\$ 66.72	\$ 37.57	\$ 37.64	\$ 267.40	84.31	442		0	4006	4452	0.0	\$ 0.19
Not Consecutive	October	2010	\$ -	\$ 17.96	\$ 17.96	\$ -	-	0	0	0	-	-	0.0	\$ 0.00

Month	Combined (kWh)	Demand 519521 (kW)
January	13293	30
February	13236	30
March	12458	28
April	8968	26
May	7852	28
June	8153	28
July	9571	30
August	10080	28
September	7670	23
October	7647	25
November	10075	28
December	16170	31
Total	127983	



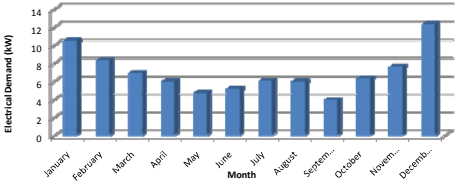
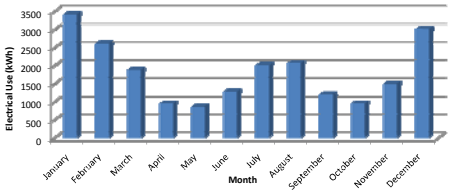
Gas Bills for Plots - City Yard							
Comments	Month	Year	Yankee Gas	Hess	Total Gas Charges	Total Therms	Cost Per Therm
			Delivery Charges Ac. #	Supply Charges Ac. #			
			572-080-0420000341593	450344/454583			
			Meter #				
			891540112				
Not Consecutive	July	2008	\$ 1.65	\$ 28.92	\$ 30.56	1	\$ 28.88
	August	2008	\$ 49.83	\$ 897.10	\$ 946.93	32	\$ 29.55
	September	2008	\$ 65.08	\$ 898.13	\$ 963.21	42	\$ 23.02
	October	2008	\$ 1,674.34	\$ 1,208.34	\$ 2,882.68	1,077	\$ 2.68
	November	2008	\$ 4,260.61	\$ 1,633.45	\$ 5,894.06	2,753	\$ 2.14
	December	2008	\$ 8,036.82	\$ 1,976.20	\$ 10,013.02	5,566	\$ 1.80
	January	2009	\$ 9,403.23	\$ 2,098.62	\$ 11,501.85	6,513	\$ 1.77
	February	2009	\$ 6,196.83	\$ 1,758.60	\$ 7,955.44	4,292	\$ 1.85
	March	2009	\$ 5,476.12	\$ 1,694.07	\$ 7,170.19	3,793	\$ 1.89
	April	2009	\$ 1,680.56	\$ 1,158.77	\$ 2,839.33	1,164	\$ 2.44
	May	2009	\$ 25.19	\$ 938.90	\$ 964.09	17	\$ 55.27
	June	2009	\$ 25.08	\$ 936.88	\$ 961.96	17	\$ 55.16
	July	2009	\$ 23.23	\$ 937.84	\$ 961.06	18	\$ 52.18
	August	2009	\$ 21.96	\$ 938.75	\$ 960.71	17	\$ 55.18
	September	2009	\$ 41.15	\$ 939.73	\$ 980.88	33	\$ 30.07
	October	2009	\$ 671.77	\$ 1,020.02	\$ 1,691.79	533	\$ 3.18
	November	2009	\$ 1,223.52	\$ 1,074.10	\$ 2,297.62	970	\$ 2.37
	December	2009	\$ 4,365.58	\$ 1,346.07	\$ 5,711.65	3,461	\$ 1.65
	January	2010	\$ 5,203.70	\$ 1,344.05	\$ 6,547.75	4,125	\$ 1.59
	February	2010	\$ 4,628.55	\$ 1,290.07	\$ 5,918.61	3,669	\$ 1.61
	March	2010	\$ 2,121.45	\$ 931.90	\$ 3,053.35	1,682	\$ 1.82
	April	2010	\$ 204.43	\$ 715.95	\$ 920.38	162	\$ 5.68
	May	2010	\$ 96.35	\$ 704.86	\$ 801.21	76	\$ 10.49
	June	2010	\$ -	\$ 692.15	\$ 692.15	-	#VALUE!
	July	2010	\$ -	\$ 692.90	\$ 692.90	-	#VALUE!

Month	Combined (Therms)
January	5319
February	3981
March	2737
April	663
May	47
June	9
July	9
August	25
September	37
October	805
November	1861
December	4514
Total	20006



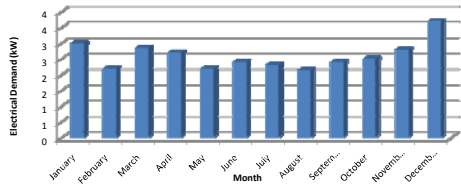
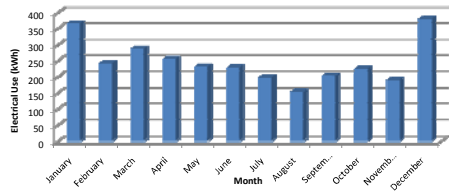
Electric Bills for Plots - Water Pollution Control - Transfer Station Small							
Month	Year	CL & P Delivery Charges Ac # 51897883054 Meter # 891775132	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
March	2009	\$ 84.92	\$ -	\$ 84.92	929	3.5	\$ 0.09
April	2009	\$ 112.63	\$ -	\$ 112.63	1063	4.4	\$ 0.11
May	2009	\$ 83.78	\$ -	\$ 83.78	626	3.8	\$ 0.13
June	2009	\$ 75.89	\$ -	\$ 75.89	706	3.7	\$ 0.11
July	2009	\$ 120.40	\$ -	\$ 120.40	1637	6.4	\$ 0.07
August	2009	\$ 151.90	\$ -	\$ 151.90	2217	6.7	\$ 0.07
September	2009	\$ 106.24	\$ -	\$ 106.24	1196	3.9	\$ 0.09
October	2009	\$ 109.54	\$ -	\$ 109.54	946	6.3	\$ 0.12
November	2009	\$ 138.58	\$ -	\$ 138.58	1492	7.6	\$ 0.09
December	2009	\$ 213.54	\$ -	\$ 213.54	3003	12.3	\$ 0.07
January	2010	\$ 247.70	\$ -	\$ 247.70	3410	10.5	\$ 0.07
February	2010	\$ 191.49	\$ -	\$ 191.49	2607	8.3	\$ 0.07
March	2010	\$ 159.65	\$ -	\$ 159.65	1976	6.9	\$ 0.09
April	2010	\$ 125.98	\$ -	\$ 125.98	819	7.5	\$ 0.15
May	2010	\$ 123.79	\$ -	\$ 123.79	1083	5.6	\$ 0.11
June	2010	\$ 139.03	\$ -	\$ 139.03	1830	6.6	\$ 0.08
July	2010	\$ 161.29	\$ -	\$ 161.29	2365	5.7	\$ 0.07
August	2010	\$ 134.07	\$ -	\$ 134.07	1903	5.2	\$ 0.07
September	2010	\$ 63.61	\$ -	\$ 63.61	714	0.0	\$ 0.02

Month	Combined (KWH)	Demand (KW)
January	3410	11
February	2607	8
March	1876	7
April	941	6
May	854	5
June	1268	5
July	2001	6
August	2060	6
September	1196	4
October	946	6
November	1492	8
December	3003	12
Total	21654	



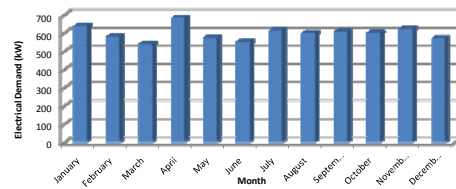
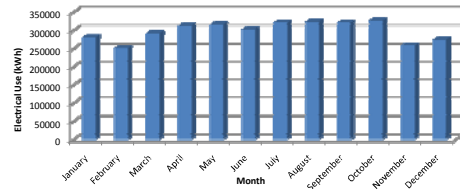
Electric Bills for Plots - Transfer Station Hut								
			CL & P Delivery Charges Ac # 51308793009 Meter # 890534802	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per Kwh
Not Consecutive	February	2009	\$ 45.89	\$ -	\$ 45.89	135	3.3	\$ 0.34
	March	2009	\$ 98.22	\$ -	\$ 98.22	301	3.8	\$ 0.33
	April	2009	\$ 93.71	\$ -	\$ 93.71	270	2.7	\$ 0.35
	May	2009	\$ 78.69	\$ -	\$ 78.69	192	2.5	\$ 0.41
	June	2009	\$ 70.14	\$ -	\$ 70.14	186	2.4	\$ 0.38
	July	2009	\$ 78.11	\$ -	\$ 78.11	212	2.7	\$ 0.37
	August	2009	\$ 71.23	\$ -	\$ 71.23	169	2.4	\$ 0.42
	September	2009	\$ 73.85	\$ -	\$ 73.85	203	2.4	\$ 0.36
	October	2009	\$ 82.28	\$ -	\$ 82.28	224	2.5	\$ 0.37
	November	2009	\$ 75.73	\$ -	\$ 75.73	189	2.8	\$ 0.40
	December	2009	\$ 108.82	\$ -	\$ 108.82	379	3.7	\$ 0.29
Not Consecutive	January	2010	\$ 109.13	\$ -	\$ 109.13	366	3.0	\$ 0.30
	February	2010	\$ 76.87	\$ -	\$ 76.87	241	2.2	\$ 0.32
	March	2010	\$ 79.58	\$ -	\$ 79.58	272	1.9	\$ 0.29
	April	2010	\$ 73.96	\$ -	\$ 73.96	240	2.7	\$ 0.31
	May	2010	\$ 82.47	\$ -	\$ 82.47	269	1.9	\$ 0.31
	June	2010	\$ 79.77	\$ -	\$ 79.77	269	2.4	\$ 0.30
	July	2010	\$ 64.21	\$ -	\$ 64.21	183	1.9	\$ 0.35
	August	2010	\$ 57.44	\$ -	\$ 57.44	136	1.9	\$ 0.42
	September	2010	\$ 26.63	\$ -	\$ 26.63	68	0.0	\$ 0.44

Month	Combined (KWH)	Demand (KW)
January	366	3
February	241	2
March	286	3
April	255	3
May	231	2
June	228	2
July	198	2
August	153	2
September	203	2
October	224	3
November	189	3
December	379	4
Total	2951	



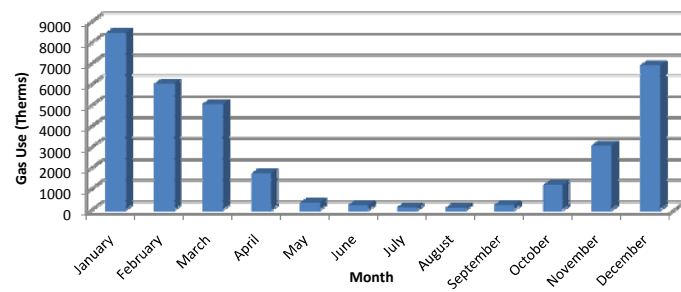
Electric Bills for Plots - Water Pollution Control - Plant Buildings								
Comments	Month	Year	CL & P Delivery Charges Ac # 51864193024 Meter # 830434882	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 9,887.22	\$ -	\$ 9,887.22	108405	94	\$ 0.04
	April	2009	\$ 10,966.39	\$ -	\$ 10,966.39	296981	619.9	\$ 0.04
	May	2009	\$ 11,840.49	\$ -	\$ 11,840.49	305542	593.3	\$ 0.04
June-July Estimated	June	2009	\$ 10,912.59	\$ -	\$ 10,912.59	297596	534.2	\$ 0.04
	July	2009	\$ 11,574.45	\$ -	\$ 11,574.45	320919	607.0	\$ 0.04
	August	2009	\$ 12,487.89	\$ -	\$ 12,487.89	322669	597.6	\$ 0.04
Oct-Nov Estimated	September	2009	\$ 11,261.42	\$ -	\$ 11,261.42	320612	606.2	\$ 0.04
	October	2009	\$ 11,443.09	\$ -	\$ 11,443.09	326629	599.0	\$ 0.04
	November	2009	\$ 14,329.43	\$ -	\$ 14,329.43	257463	622.8	\$ 0.06
	December	2009	\$ 11,714.47	\$ -	\$ 11,714.47	272953	568.1	\$ 0.04
Feb Estimated	January	2010	\$ 12,424.03	\$ -	\$ 12,424.03	279861	636.5	\$ 0.04
	February	2010	\$ 11,255.96	\$ -	\$ 11,255.96	249693	577.4	\$ 0.05
	March	2010	\$ 11,452.86	\$ -	\$ 11,452.86	291172	537.1	\$ 0.04
	April	2010	\$ 13,337.28	\$ -	\$ 13,337.28	327684	739.4	\$ 0.04
May-June Estimated	May	2010	\$ 13,985.91	\$ -	\$ 13,985.91	325216	553.7	\$ 0.04
	June	2010	\$ 12,836.70	\$ -	\$ 12,836.70	305964	567.4	\$ 0.04
	July	2010	\$ 13,478.78	\$ -	\$ 13,478.78	319884	616.3	\$ 0.04
Not Consecutive	August	2010	\$ 8,778.54	\$ -	\$ 8,778.54	196536	624.2	\$ 0.04

Month	Combined (KWH)	Demand (KW)
January	279861	637
February	249693	577
March	291172	537
April	312282	680
May	315379	574
June	301780	551
July	320402	612
August	322669	598
September	320612	606
October	326629	599
November	257463	623
December	272953	568
Total	3570896	



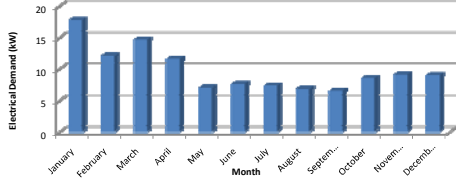
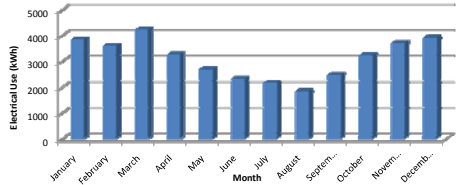
Gas Bills for Plots - Water Pollution Control - Plant Buildings							
Comments	Month	Year	Yankee Gas Delivery Charges Ac. # 141-960-0700000289734	Hess Supply Charges Ac. # 450344/454585	Total Gas Charges	Total Therms	Cost Per Therm
			Meter # 890434882				
Not Consecutive	July	2008	\$ -2.62	\$ -38.88	\$ -41.50	2	\$ -24.61
	August	2008	\$ 88.98	\$ 1,207.98	\$ 1,296.96	57	\$ 22.67
	September	2008	\$ 356.24	\$ 1,256.38	\$ 1,612.62	229	\$ 7.04
	October	2008	\$ 1,920.54	\$ 1,552.43	\$ 3,472.98	1,235	\$ 2.81
	November	2008	\$ 6,128.21	\$ 2,095.46	\$ 8,223.68	3,956	\$ 2.08
	December	2008	\$ 9,672.30	\$ 2,417.50	\$ 12,089.80	6,699	\$ 1.80
	January	2009	\$ 12,670.59	\$ 2,527.40	\$ 15,198.00	8,776	\$ 1.73
	February	2009	\$ 9,903.95	\$ 2,249.60	\$ 12,153.56	6,860	\$ 1.77
	March	2009	\$ 9,594.51	\$ 2,217.44	\$ 11,811.95	6,645	\$ 1.78
	April	2009	\$ 3,377.50	\$ 1,639.73	\$ 5,017.23	2,339	\$ 2.15
	May	2009	\$ 511.14	\$ 1,184.33	\$ 1,695.47	354	\$ 4.79
	June	2009	\$ 414.31	\$ 1,173.55	\$ 1,587.86	287	\$ 5.53
	July	2009	\$ 152.90	\$ 1,152.95	\$ 1,305.85	121	\$ 10.77
	August	2009	\$ 128.45	\$ 1,152.19	\$ 1,280.64	102	\$ 12.58
	September	2009	\$ 284.06	\$ 1,171.96	\$ 1,456.02	225	\$ 6.47
	October	2009	\$ 1,366.75	\$ 1,309.67	\$ 2,676.42	1,083	\$ 2.47
	November	2009	\$ 2,690.22	\$ 1,444.26	\$ 4,134.49	2,133	\$ 1.94
	December	2009	\$ 8,899.75	\$ 1,967.44	\$ 10,867.18	7,056	\$ 1.54
Not Consecutive	January	2010	\$ 10,220.22	\$ 2,143.69	\$ 12,363.91	8,102	\$ 1.53
	February	2010	\$ 6,503.23	\$ 1,866.89	\$ 8,370.12	5,156	\$ 1.62
	March	2010	\$ 4,356.99	\$ 1,716.35	\$ 6,073.35	3,454	\$ 1.76
	April	2010	\$ 1,400.50	\$ 1,422.10	\$ 2,822.60	1,110	\$ 2.54
	May	2010	\$ 364.24	\$ 1,304.19	\$ 1,668.43	289	\$ 5.78
	June	2010	\$ 187.90	\$ 1,281.00	\$ 1,468.91	150	\$ 9.82
	July	2010	\$ 90.24	\$ 1,272.67	\$ 1,362.91	93	\$ 14.64
	August	2010	\$ 111.59	\$ 1,234.91	\$ 1,346.50	115	\$ 11.70

Month	Combined (Therms)
January	8439
February	6008
March	5050
April	1725
May	321
June	218
July	107
August	80
September	227
October	1159
November	3044
December	6877
Total	33256



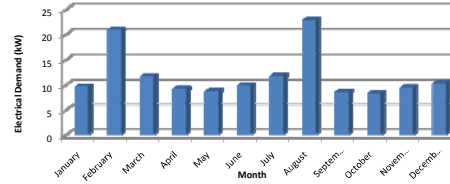
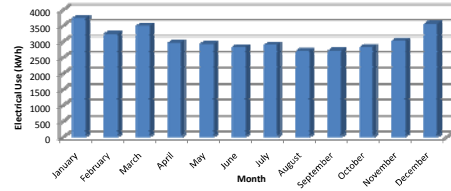
Electric Bills for Plots - Water Pollution Control - Minor								
Comments	Month	Year	CL & P	0	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
			Delivery Charges Ac # 51103853057 Meter # 886921262	Supply Charges Ac #				
Not Consecutive	March	2009	\$ 109.70	\$ -	\$ 109.70	1650	9.6	\$ 0.07
	April	2009	\$ 204.51	\$ -	\$ 204.51	3145	9.8	\$ 0.07
June-July Estimated	May	2009	\$ 190.36	\$ -	\$ 190.36	2840	7.3	\$ 0.07
	June	2009	\$ 185.78	\$ -	\$ 185.78	2666	8.1	\$ 0.07
	July	2009	\$ 195.41	\$ -	\$ 195.41	2941	8.9	\$ 0.07
	August	2009	\$ 179.50	\$ -	\$ 179.50	2644	8.3	\$ 0.07
	September	2009	\$ 168.52	\$ -	\$ 168.52	2462	6.5	\$ 0.07
	October	2009	\$ 208.01	\$ -	\$ 208.01	3232	8.5	\$ 0.06
Dec-Jan Estimated	November	2009	\$ 217.21	\$ -	\$ 217.21	3695	9.1	\$ 0.06
	December	2009	\$ 269.75	\$ -	\$ 269.75	3911	9.0	\$ 0.07
	January	2010	\$ 300.05	\$ -	\$ 300.05	3838	17.7	\$ 0.08
	February	2010	\$ 269.51	\$ -	\$ 269.51	3594	12.1	\$ 0.07
	March	2010	\$ 308.47	\$ -	\$ 308.47	4221	14.6	\$ 0.07
	April	2010	\$ 237.52	\$ -	\$ 237.52	3378	13.3	\$ 0.07
June-July Estimated	May	2010	\$ 177.50	\$ -	\$ 177.50	2514	6.7	\$ 0.07
	June	2010	\$ 147.03	\$ -	\$ 147.03	1952	7.1	\$ 0.08
	July	2010	\$ 121.31	\$ -	\$ 121.31	1382	5.7	\$ 0.09
	August	2010	\$ 115.19	\$ -	\$ 115.19	1027	5.4	\$ 0.11
Not Consecutive	September	2010	\$ 66.32	\$ -	\$ 66.32	689	6.0	\$ 0.11
Not Consecutive	October	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
Not Consecutive	November	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
Not Consecutive	December	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!

Month	Combined (KWH)	Demand (KW)
January	3838	18
February	3594	12
March	4221	15
April	3262	12
May	2677	7
June	2309	8
July	2161	7
August	1835	7
September	2462	7
October	3232	9
November	3695	9
December	3911	9
Total	37197	



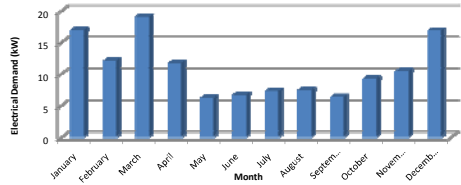
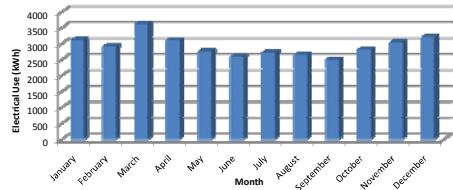
Electric Bills for Plots - Water Pollution Control - Middle									
			CL & P Delivery Charges Ac # 51836063065 Meter # 886920412	0 Supply Charges Ac #					
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh	
Not Consecutive June-July Estimated	March	2009	\$ 115.68	\$ -	\$ 115.68	1665	9.6	\$ 0.07	
	April	2009	\$ 201.25	\$ -	\$ 201.25	2796	8.8	\$ 0.07	
	May	2009	\$ 221.79	\$ -	\$ 221.79	2947	9.1	\$ 0.08	
	June	2009	\$ 208.23	\$ -	\$ 208.23	2985	10.2	\$ 0.07	
	July	2009	\$ 207.71	\$ -	\$ 207.71	3205	9.5	\$ 0.06	
	August	2009	\$ 197.01	\$ -	\$ 197.01	3073	8.4	\$ 0.06	
	September	2009	\$ 183.18	\$ -	\$ 183.18	2698	8.5	\$ 0.07	
	October	2009	\$ 204.96	\$ -	\$ 204.96	2809	8.2	\$ 0.07	
	November	2009	\$ 211.46	\$ -	\$ 211.46	3007	9.4	\$ 0.07	
	December	2009	\$ 219.86	\$ -	\$ 219.86	3535	10.2	\$ 0.06	
Dec-Jan Estimated	January	2010	\$ 317.96	\$ -	\$ 317.96	3720	9.6	\$ 0.09	
	February	2010	\$ 278.57	\$ -	\$ 278.57	3233	20.9	\$ 0.09	
Not Consecutive June-July Estimated	March	2010	\$ 241.70	\$ -	\$ 241.70	3480	11.6	\$ 0.07	
	April	2010	\$ 212.90	\$ -	\$ 212.90	3113	9.5	\$ 0.07	
	May	2010	\$ 205.79	\$ -	\$ 205.79	2875	8.2	\$ 0.07	
	June	2010	\$ 229.09	\$ -	\$ 229.09	2625	9.4	\$ 0.09	
	July	2010	\$ 432.09	\$ -	\$ 432.09	2555	14.0	\$ 0.17	
	August	2010	\$ 332.93	\$ -	\$ 332.93	2296	37.3	\$ 0.15	
	September	2010	\$ 82.84	\$ -	\$ 82.84	984	9.4	\$ 0.08	
	October	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!	
	Not Consecutive	November	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
	Not Consecutive	December	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!

Month	Combined (KWH)	Demand (KW)
January	3720	10
February	3233	21
March	3480	12
April	2954	9
May	2911	9
June	2805	10
July	2880	12
August	2684	23
September	2698	9
October	2809	8
November	3007	9
December	3535	10
Total	36716	



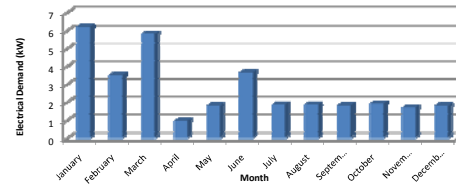
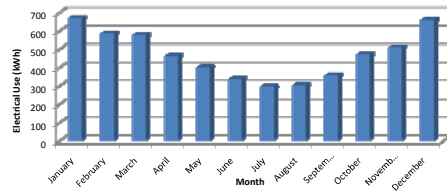
Electric Bills for Plots - Water Pollution Control - Matthews								
Comments	Month	Year	CL & P Delivery Charges Ac # 51408853067 Meter # 886921532	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 115.15	\$ -	\$ 115.15	1500	0.0	\$ 0.08
	April	2009	\$ 201.94	\$ -	\$ 201.94	2874	11.7	\$ 0.07
June-July Estimated	May	2009	\$ 171.30	\$ -	\$ 171.30	2648	6.1	\$ 0.06
	June	2009	\$ 162.21	\$ -	\$ 162.21	2472	7.0	\$ 0.07
	July	2009	\$ 168.98	\$ -	\$ 168.98	2808	6.5	\$ 0.06
	August	2009	\$ 173.49	\$ -	\$ 173.49	2813	7.0	\$ 0.06
	September	2009	\$ 171.37	\$ -	\$ 171.37	2481	6.3	\$ 0.07
	October	2009	\$ 208.32	\$ -	\$ 208.32	2795	9.2	\$ 0.07
	November	2009	\$ 203.32	\$ -	\$ 203.32	3025	10.4	\$ 0.07
	December	2009	\$ 241.52	\$ -	\$ 241.52	3199	16.8	\$ 0.08
Dec-Jan Estimated	January	2010	\$ 273.16	\$ -	\$ 273.16	3103	16.9	\$ 0.09
June-July Estimated	February	2010	\$ 267.78	\$ -	\$ 267.78	2901	12.0	\$ 0.09
	March	2010	\$ 314.33	\$ -	\$ 314.33	3605	19.0	\$ 0.09
	April	2010	\$ 221.55	\$ -	\$ 221.55	3304	11.6	\$ 0.07
	May	2010	\$ 180.43	\$ -	\$ 180.43	2850	6.3	\$ 0.06
	June	2010	\$ 174.29	\$ -	\$ 174.29	2679	6.3	\$ 0.07
	July	2010	\$ 185.41	\$ -	\$ 185.41	2623	8.0	\$ 0.07
	August	2010	\$ 174.24	\$ -	\$ 174.24	2463	7.8	\$ 0.07
	September	2010	\$ 88.00	\$ -	\$ 88.00	1337	4.0	\$ 0.07
Not Consecutive	October	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
Not Consecutive	November	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
Not Consecutive	December	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!

Month	Combined (KWH)	Demand (KW)
January	3103	17
February	2901	12
March	3605	19
April	3089	12
May	2749	6
June	2575	7
July	2715	7
August	2638	7
September	2481	6
October	2795	9
November	3025	10
December	3199	17
Total	34876	



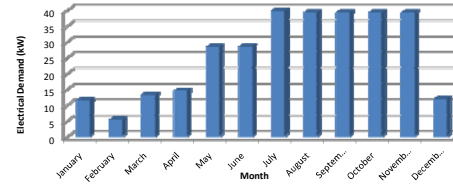
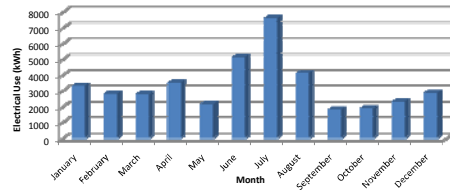
Electric Bills for Plots - Water Pollution Control - Lufkin								
Comments	Month	Year	CL & P Delivery Charges Ac # 51537993073 Meter # 820645762	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	April	2009	\$ 89.18	\$ -	\$ 89.18	369	0.0	\$ 0.24
June-July Estimated	May	2009	\$ 103.79	\$ -	\$ 103.79	418	1.8	\$ 0.25
	June	2009	\$ 95.60	\$ -	\$ 95.60	369	1.9	\$ 0.26
	July	2009	\$ 90.18	\$ -	\$ 90.18	334	1.8	\$ 0.27
	August	2009	\$ 89.03	\$ -	\$ 89.03	329	1.8	\$ 0.27
Dec-Jan Estimated	September	2009	\$ 96.13	\$ -	\$ 96.13	377	1.8	\$ 0.26
	October	2009	\$ 111.10	\$ -	\$ 111.10	471	1.9	\$ 0.24
	November	2009	\$ 116.28	\$ -	\$ 116.28	508	1.7	\$ 0.23
	December	2009	\$ 178.90	\$ -	\$ 178.90	658	1.8	\$ 0.27
June-July Estimated	January	2010	\$ 160.97	\$ -	\$ 160.97	667	6.2	\$ 0.24
	February	2010	\$ 161.93	\$ -	\$ 161.93	584	3.5	\$ 0.28
	March	2010	\$ 133.49	\$ -	\$ 133.49	576	5.8	\$ 0.23
	April	2010	\$ 106.03	\$ -	\$ 106.03	461	1.9	\$ 0.23
	May	2010	\$ 126.54	\$ -	\$ 126.54	379	1.8	\$ 0.33
	June	2010	\$ 90.15	\$ -	\$ 90.15	301	5.4	\$ 0.30
	July	2010	\$ 76.12	\$ -	\$ 76.12	255	1.9	\$ 0.30
	August	2010	\$ 78.67	\$ -	\$ 78.67	275	1.9	\$ 0.29
	September	2010	\$ 87.05	\$ -	\$ 87.05	334	1.8	\$ 0.26
	October	2010	\$ 17.00	\$ -	\$ 17.00	39	0.0	\$ 0.26
Not Consecutive	November	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
Not Consecutive	December	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!

Month	Combined (KWH)	Demand (KW)
January	667	6
February	584	4
March	576	6
April	461	1
May	398	2
June	335	4
July	295	2
August	302	2
September	355	2
October	471	2
November	508	2
December	658	2
Total	5610	



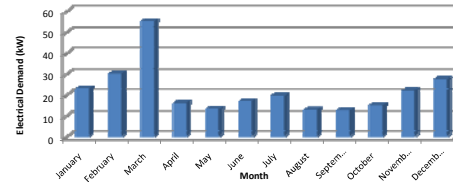
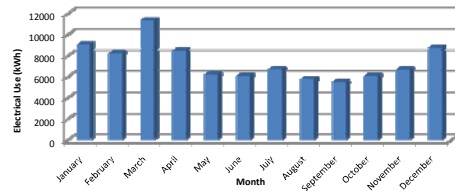
Electric Bills for Plots - Water Pollution Control - Lake								
			CL & P Delivery Charges Ac # 51660293051 Reference # 820904992	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 111.98	\$ -	\$ 111.98	1716	0.6	\$ 0.02
	April	2009	\$ 262.27	\$ -	\$ 262.27	3512	10.4	\$ 0.07
	May	2009	\$ 151.26	\$ -	\$ 151.26	807	10.8	\$ 0.19
	June	2009	\$ 361.74	\$ -	\$ 361.74	6221	10.8	\$ 0.06
	July	2009	\$ 708.81	\$ -	\$ 708.81	11997	28.8	\$ 0.06
	August	2009	\$ 522.34	\$ -	\$ 522.34	1865	39.2	\$ 0.28
	September	2009	\$ 517.62	\$ -	\$ 517.62	1804	39.2	\$ 0.29
	October	2009	\$ 500.34	\$ -	\$ 500.34	1886	39.2	\$ 0.27
	November	2009	\$ 360.48	\$ -	\$ 360.48	2306	39.2	\$ 0.16
	December	2009	\$ 222.89	\$ -	\$ 222.89	2853	11.9	\$ 0.08
	January	2010	\$ 194.30	\$ -	\$ 194.30	3311	11.5	\$ 0.06
	February	2010	\$ 174.89	\$ -	\$ 174.89	2799	5.3	\$ 0.06
Not Consecutive Not Consecutive Not Consecutive Not Consecutive	March	2010	\$ 291.22	\$ -	\$ 291.22	2777	13.2	\$ 0.10
	April	2010	\$ 519.35	\$ -	\$ 519.35	3535	18.5	\$ 0.15
	May	2010	\$ 663.55	\$ -	\$ 663.55	3464	46.0	\$ 0.19
	June	2010	\$ 691.01	\$ -	\$ 691.01	4022	46.0	\$ 0.17
	July	2010	\$ 612.59	\$ -	\$ 612.59	3193	50.7	\$ 0.19
	August	2010	\$ 706.50	\$ -	\$ 706.50	6349	39.2	\$ 0.11
	September	2010	\$ 483.08	\$ -	\$ 483.08	6648	46.2	\$ 0.08
	October	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
	November	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
	December	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!

Month	Combined (KWH)	Demand (KW)
January	3311	12
February	2799	5
March	2777	13
April	3523	14
May	2136	28
June	5122	28
July	7595	40
August	4107	39
September	1804	39
October	1886	39
November	2306	39
December	2853	12
Total	40217	



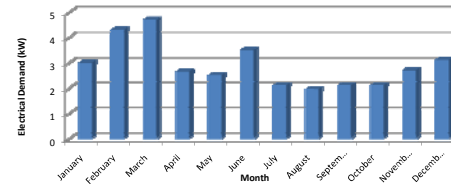
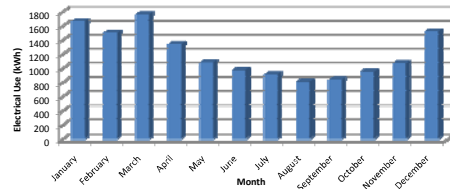
Electric Bills for Plots - Water Pollution Control - Julia								
Comments	Month	Year	CL & P Delivery Charges Ac # Meter # 51968163071 886989042	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 344.74	\$ -	\$ 344.74	4680	90.4	\$ 0.07
	April	2009	\$ 478.62	\$ -	\$ 478.62	7348	14.2	\$ 0.07
	May	2009	\$ 385.68	\$ -	\$ 385.68	6468	14.7	\$ 0.06
June-July Estimated	June	2009	\$ 456.76	\$ -	\$ 456.76	7802	23.5	\$ 0.06
	July	2009	\$ 539.37	\$ -	\$ 539.37	9525	21.4	\$ 0.06
	August	2009	\$ 420.52	\$ -	\$ 420.52	7527	14.1	\$ 0.06
	September	2009	\$ 313.22	\$ -	\$ 313.22	5467	12.5	\$ 0.06
	October	2009	\$ 355.27	\$ -	\$ 355.27	6029	15.0	\$ 0.06
	November	2009	\$ 421.82	\$ -	\$ 421.82	6656	22.1	\$ 0.06
Dec-Jan Estimated	December	2009	\$ 535.22	\$ -	\$ 535.22	8710	27.5	\$ 0.06
	January	2010	\$ 571.63	\$ -	\$ 571.63	9011	23.0	\$ 0.06
	February	2010	\$ 551.23	\$ -	\$ 551.23	8202	30.1	\$ 0.07
	March	2010	\$ 862.22	\$ -	\$ 862.22	11316	55.2	\$ 0.08
	April	2010	\$ 720.11	\$ -	\$ 720.11	9606	18.1	\$ 0.07
	May	2010	\$ 362.70	\$ -	\$ 362.70	5892	11.7	\$ 0.06
June-July Estimated	June	2010	\$ 265.30	\$ -	\$ 265.30	4288	10.1	\$ 0.06
	July	2010	\$ 312.16	\$ -	\$ 312.16	3855	18.1	\$ 0.08
	August	2010	\$ 299.19	\$ -	\$ 299.19	3944	11.5	\$ 0.08
Not Consecutive	September	2010	\$ 118.22	\$ -	\$ 118.22	1883	9.0	\$ 0.06
Not Consecutive	October	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
Not Consecutive	November	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
Not Consecutive	December	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!

Month	Combined (KWH)	Demand (KW)
January	9011	23
February	8202	30
March	11316	55
April	8477	16
May	6180	13
June	6045	17
July	6690	20
August	5735	13
September	5467	13
October	6029	15
November	6656	22
December	8710	28
Total	88519	



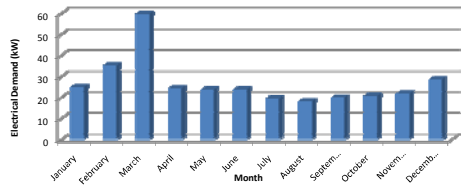
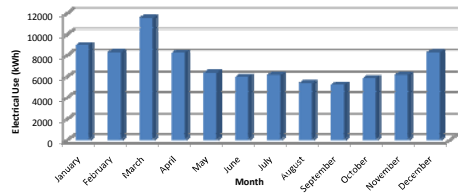
Electric Bills for Plots - Water Pollution Control - Ivy							
Comments	Month	Year	CL & P Delivery Charges Ac # 51580063055 Meter # 886126132	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand
Not Consecutive	March	2009	\$ 71.47	\$ -	\$ 71.47	1094	2.5
	April	2009	\$ 83.82	\$ -	\$ 83.82	1283	2.5
	May	2009	\$ 83.47	\$ -	\$ 83.47	1172	2.9
June-July Estimated	June	2009	\$ 94.12	\$ -	\$ 94.12	1169	4.9
	July	2009	\$ 86.94	\$ -	\$ 86.94	1153	2.4
	August	2009	\$ 67.66	\$ -	\$ 67.66	936	2.1
	September	2009	\$ 63.77	\$ -	\$ 63.77	837	2.1
	October	2009	\$ 67.99	\$ -	\$ 67.99	949	2.1
	November	2009	\$ 70.58	\$ -	\$ 70.58	1070	2.7
Dec-Jan Estimated	December	2009	\$ 87.62	\$ -	\$ 87.62	1518	3.1
	January	2010	\$ 100.28	\$ -	\$ 100.28	1661	3.0
	February	2010	\$ 102.14	\$ -	\$ 102.14	1498	4.3
	March	2010	\$ 120.15	\$ -	\$ 120.15	1759	4.7
	April	2010	\$ 97.53	\$ -	\$ 97.53	1396	2.8
June-July Estimated	May	2010	\$ 74.14	\$ -	\$ 74.14	993	2.1
	June	2010	\$ 60.94	\$ -	\$ 60.94	775	2.1
	July	2010	\$ 59.64	\$ -	\$ 59.64	669	1.8
	August	2010	\$ 59.07	\$ -	\$ 59.07	680	1.8
Not Consecutive	September	2010	\$ 19.08	\$ -	\$ 19.08	220	0.0

Month	Combined (KWH)	Demand (KW)
January	1661	3
February	1498	4
March	1759	5
April	1340	3
May	1083	3
June	972	4
July	911	2
August	808	2
September	837	2
October	949	2
November	1070	3
December	1518	3
Total	14405	



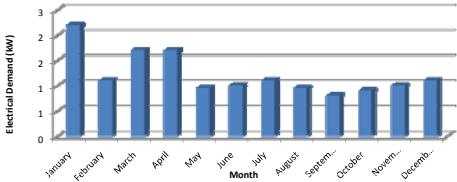
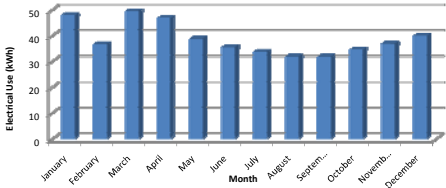
Electric Bills for Plots - Water Pollution Control - East Main								
			CL & P Delivery Charges Ac # 51447063074 Meter # 820169712	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 280.36	\$ -	\$ 280.36	3792	24.5	\$ 0.07
	April	2009	\$ 460.44	\$ -	\$ 460.44	6302	21.1	\$ 0.07
	May	2009	\$ 440.48	\$ -	\$ 440.48	5973	19.9	\$ 0.07
	June	2009	\$ 455.76	\$ -	\$ 455.76	6701	24.7	\$ 0.07
	July	2009	\$ 492.87	\$ -	\$ 492.87	7507	21.8	\$ 0.07
	August	2009	\$ 413.84	\$ -	\$ 413.84	6102	18.5	\$ 0.07
	September	2009	\$ 374.80	\$ -	\$ 374.80	5180	19.7	\$ 0.07
	October	2009	\$ 428.46	\$ -	\$ 428.46	5798	20.5	\$ 0.07
	November	2009	\$ 427.48	\$ -	\$ 427.48	6116	21.7	\$ 0.07
Dec-Jan Estimated	December	2009	\$ 525.71	\$ -	\$ 525.71	8220	28.3	\$ 0.06
Not Consecutive	January	2010	\$ 585.27	\$ -	\$ 585.27	8921	24.7	\$ 0.07
	February	2010	\$ 591.57	\$ -	\$ 591.57	8248	35.1	\$ 0.07
	March	2010	\$ 923.19	\$ -	\$ 923.19	11516	59.6	\$ 0.08
	April	2010	\$ 816.34	\$ -	\$ 816.34	10096	27.0	\$ 0.08
	May	2010	\$ 534.52	\$ -	\$ 534.52	6680	27.1	\$ 0.08
	June	2010	\$ 448.36	\$ -	\$ 448.36	5144	22.5	\$ 0.09
	July	2010	\$ 398.62	\$ -	\$ 398.62	4726	17.0	\$ 0.08
	August	2010	\$ 353.74	\$ -	\$ 353.74	4574	17.5	\$ 0.08
	September	2010	\$ 166.04	\$ -	\$ 166.04	2041	9.0	\$ 0.08

Month	Combined (KWH)	Demand (KW)
January	8921	25
February	8248	35
March	11516	60
April	8199	24
May	6327	24
June	5923	24
July	6116	19
August	5338	18
September	5180	20
October	5798	21
November	6116	22
December	8220	28
Total	85901	



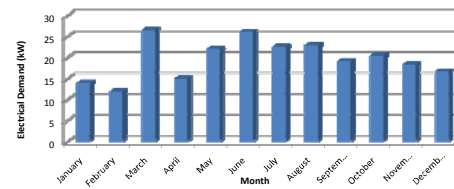
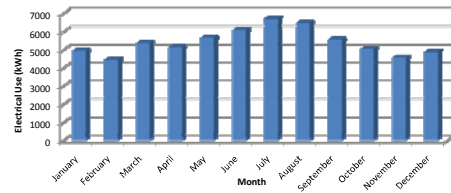
Electric Bills for Plots - Water Pollution Control - Drayla									
			CL & P Delivery Charges Ac # 51861063071 Meter # 886928702	0 Supply Charges Ac #					
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh	
Not Consecutive	April	2009	\$ 30.82	\$ -	\$ 30.82	25	0.8	\$ 1.23	
	May	2009	\$ 44.75	\$ -	\$ 44.75	38	1.0	\$ 1.18	
June-July Estimated	June	2009	\$ 43.42	\$ -	\$ 43.42	34	1.0	\$ 1.27	
	July	2009	\$ 44.11	\$ -	\$ 44.11	34	1.0	\$ 1.30	
	August	2009	\$ 43.51	\$ -	\$ 43.51	33	0.7	\$ 1.34	
	September	2009	\$ 43.00	\$ -	\$ 43.00	32	0.8	\$ 1.36	
	October	2009	\$ 44.17	\$ -	\$ 44.17	34	0.9	\$ 1.28	
	November	2009	\$ 43.78	\$ -	\$ 43.78	37	1.0	\$ 1.19	
Dec-Jan Estimated	December	2009	\$ 44.94	\$ -	\$ 44.94	40	1.1	\$ 1.13	
	January	2010	\$ 47.25	\$ -	\$ 47.25	48	2.2	\$ 0.99	
June-July Estimated	February	2010	\$ 43.35	\$ -	\$ 43.35	37	1.1	\$ 1.19	
	March	2010	\$ 46.94	\$ -	\$ 46.94	49	1.7	\$ 0.95	
	April	2010	\$ 45.00	\$ -	\$ 45.00	47	1.7	\$ 0.96	
	May	2010	\$ 44.67	\$ -	\$ 44.67	39	0.9	\$ 1.13	
	June	2010	\$ 43.51	\$ -	\$ 43.51	37	1.0	\$ 1.19	
	July	2010	\$ 44.76	\$ -	\$ 44.76	33	1.2	\$ 1.35	
	August	2010	\$ 43.77	\$ -	\$ 43.77	31	1.2	\$ 1.41	
	Not Consecutive	September	2010	\$ 12.62	\$ -	\$ 12.62	9	0.6	\$ 1.40

Month	Combingd (KWH)	Demand (KW)
January	48	2
February	37	1
March	49	2
April	47	2
May	39	1
June	35	1
July	34	1
August	32	1
September	32	1
October	34	1
November	37	1
December	40	1
Total	462	



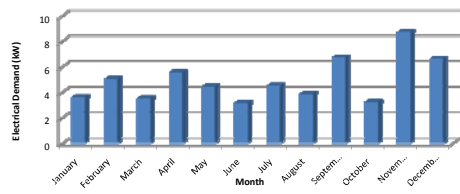
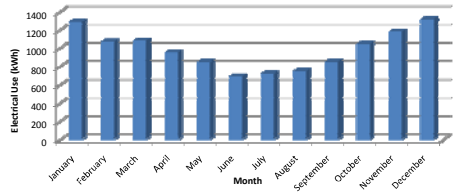
Electric Bills for Plots - Water Pollution Control - Cross								
			CL & P Delivery Charges Ac # 51326593027 Meter # 820323852	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per KWH
Not Consecutive	March	2009	\$ 184.36	\$ -	\$ 184.36	2916	13.6	\$ 0.06
	April	2009	\$ 325.95	\$ -	\$ 325.95	5022	13.9	\$ 0.06
	May	2009	\$ 399.47	\$ -	\$ 399.47	5694	20.1	\$ 0.07
	June	2009	\$ 476.47	\$ -	\$ 476.47	6336	29.5	\$ 0.08
	July	2009	\$ 523.00	\$ -	\$ 523.00	7174	24.1	\$ 0.07
	August	2009	\$ 481.96	\$ -	\$ 481.96	6770	24.3	\$ 0.07
	September	2009	\$ 410.69	\$ -	\$ 410.69	5557	19.1	\$ 0.07
	October	2009	\$ 405.02	\$ -	\$ 405.02	5034	20.5	\$ 0.08
	November	2009	\$ 360.21	\$ -	\$ 360.21	4550	18.3	\$ 0.08
Dec-Jan Estimated	December	2009	\$ 337.93	\$ -	\$ 337.93	4854	16.6	\$ 0.07
June-July Estimated	January	2010	\$ 336.92	\$ -	\$ 336.92	4934	13.9	\$ 0.07
	February	2010	\$ 283.38	\$ -	\$ 283.38	4438	11.8	\$ 0.06
	March	2010	\$ 404.88	\$ -	\$ 404.88	5355	26.5	\$ 0.08
	April	2010	\$ 419.85	\$ -	\$ 419.85	5247	16.0	\$ 0.08
	May	2010	\$ 424.34	\$ -	\$ 424.34	5608	24.0	\$ 0.08
	June	2010	\$ 453.31	\$ -	\$ 453.31	5811	22.7	\$ 0.08
	July	2010	\$ 470.97	\$ -	\$ 470.97	6222	20.9	\$ 0.08
	August	2010	\$ 447.28	\$ -	\$ 447.28	6166	21.5	\$ 0.07
	Not Consecutive	September	2010	\$ 196.62	\$ -	\$ 196.62	2729	0.0

Month	Combined (KWH)	Demand (KW)
January	4354	14
February	4438	12
March	5355	27
April	5134	15
May	5651	22
June	6074	26
July	6698	23
August	6468	23
September	5557	19
October	5034	21
November	4550	18
December	4854	17
Total	64746	



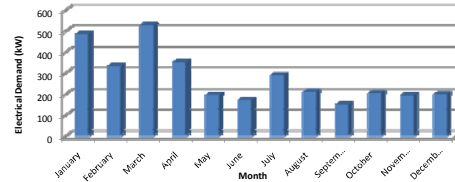
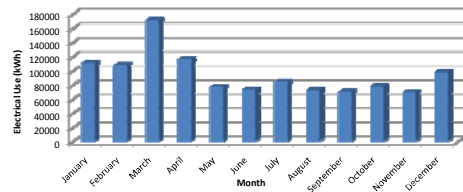
Electric Bills for Plots - Water Pollution Control - Cherry Hill								
			CL & P Delivery Charges Ac # 51272853045 Meter # 886124482	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 70.94	\$ -	\$ 70.94	679	4.7	\$ 0.10
	April	2009	\$ 102.93	\$ -	\$ 102.93	939	6.0	\$ 0.11
June-July Estimated	May	2009	\$ 92.83	\$ -	\$ 92.83	815	3.8	\$ 0.11
	June	2009	\$ 68.54	\$ -	\$ 68.54	632	3.0	\$ 0.11
	July	2009	\$ 92.35	\$ -	\$ 92.35	717	6.0	\$ 0.13
	August	2009	\$ 86.36	\$ -	\$ 86.36	654	3.4	\$ 0.13
	September	2009	\$ 107.68	\$ -	\$ 107.68	848	6.7	\$ 0.13
Dec-Jan Estimated	October	2009	\$ 96.15	\$ -	\$ 96.15	1044	3.2	\$ 0.09
	November	2009	\$ 127.22	\$ -	\$ 127.22	1175	8.7	\$ 0.11
	December	2009	\$ 127.70	\$ -	\$ 127.70	1314	6.6	\$ 0.10
	January	2010	\$ 108.65	\$ -	\$ 108.65	1286	3.6	\$ 0.08
	February	2010	\$ 96.84	\$ -	\$ 96.84	1069	5.0	\$ 0.09
June-July Estimated	March	2010	\$ 94.14	\$ -	\$ 94.14	1079	3.5	\$ 0.09
	April	2010	\$ 96.16	\$ -	\$ 96.16	964	5.1	\$ 0.10
	May	2010	\$ 104.42	\$ -	\$ 104.42	879	5.1	\$ 0.12
	June	2010	\$ 80.60	\$ -	\$ 80.60	743	3.3	\$ 0.11
	July	2010	\$ 74.48	\$ -	\$ 74.48	724	3.0	\$ 0.10
	August	2010	\$ 86.67	\$ -	\$ 86.67	838	4.3	\$ 0.10
	Not Consecutive	September	2010	\$ 20.72	\$ -	\$ 20.72	289	0.9

Month	Combined (KWH)	Demand (KW)
January	1286	4
February	1069	5
March	1079	4
April	952	6
May	847	4
June	687	3
July	720	5
August	746	4
September	848	7
October	1044	3
November	1175	9
December	1314	7
Total	11765	



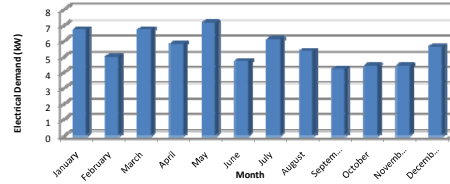
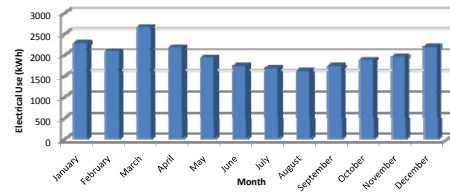
Electric Bills for Plots - Water Pollution Control - Broad								
			CL & P Delivery Charges Ac # 51318953049 Meter # 821605802	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per KWH
Not Consecutive	March	2009	\$ 2,011.09	\$ -	\$ 2,011.09	20690	0.0	\$ 0.02
	April	2009	\$ 5,568.62	\$ -	\$ 5,568.62	80807	206.8	\$ 0.07
	May	2009	\$ 5,682.43	\$ -	\$ 5,682.43	75415	207.4	\$ 0.08
	June	2009	\$ 5,264.26	\$ -	\$ 5,264.26	85680	194.1	\$ 0.06
	July	2009	\$ 5,874.77	\$ -	\$ 5,874.77	114341	433.7	\$ 0.05
June-July Estimated	August	2009	\$ 5,397.07	\$ -	\$ 5,397.07	92057	297.2	\$ 0.06
	September	2009	\$ 3,998.04	\$ -	\$ 3,998.04	70514	149.2	\$ 0.06
Oct Estimated	October	2009	\$ 4,088.85	\$ -	\$ 4,088.85	77915	202.8	\$ 0.05
	November	2009	\$ 5,345.50	\$ -	\$ 5,345.50	69561	193.5	\$ 0.08
	December	2009	\$ 5,756.48	\$ -	\$ 5,756.48	98259	196.4	\$ 0.06
	January	2010	\$ 6,457.66	\$ -	\$ 6,457.66	111105	482.7	\$ 0.06
Not Consecutive	February	2010	\$ 6,932.02	\$ -	\$ 6,932.02	107991	332.4	\$ 0.06
	March	2010	\$ 9,370.61	\$ -	\$ 9,370.61	171596	527.0	\$ 0.05
	April	2010	\$ 7,594.64	\$ -	\$ 7,594.64	152005	494.8	\$ 0.05
	May	2010	\$ 5,512.17	\$ -	\$ 5,512.17	78303	182.6	\$ 0.07
	June	2010	\$ 5,091.80	\$ -	\$ 5,091.80	60866	145.2	\$ 0.08
	July	2010	\$ 4,911.24	\$ -	\$ 4,911.24	54262	141.7	\$ 0.09
	August	2010	\$ 4,810.45	\$ -	\$ 4,810.45	53016	121.0	\$ 0.09
	September	2010	\$ 3,184.22	\$ -	\$ 3,184.22	26480	128.4	\$ 0.09

Month	Combined (KWH)	Demand (KW)
January	111105	483
February	107991	332
March	171596	527
April	116406	351
May	76859	195
June	73273	170
July	84302	288
August	72537	209
September	70514	149
October	77915	203
November	69561	194
December	98259	196
Total	1130318	



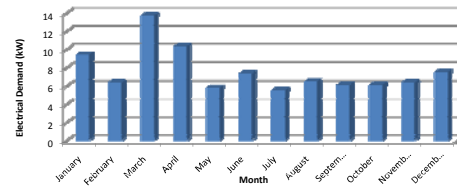
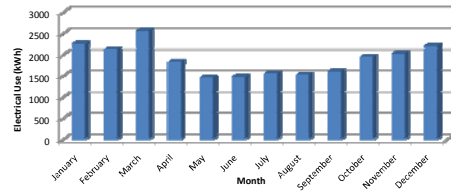
Electric Bills for Plots - Water Pollution Control - Boivin								
Comments	Month	Year	CL & P Delivery Charges Ac # 51146753074 Meter # 830527022	0 Supply Charges Ac #	Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive	March	2009	\$ 68.29	\$ -	\$ 68.29	4648	0.9	\$ 0.07
	April	2009	\$ 128.35	\$ -	\$ 128.35	1908	5.2	\$ 0.07
	May	2009	\$ 127.75	\$ -	\$ 127.75	1867	4.6	\$ 0.07
June-July Estimated	June	2009	\$ 123.16	\$ -	\$ 123.16	1761	4.9	\$ 0.07
	July	2009	\$ 135.49	\$ -	\$ 135.49	1872	5.5	\$ 0.07
	August	2009	\$ 128.16	\$ -	\$ 128.16	1836	6.4	\$ 0.07
	September	2009	\$ 112.52	\$ -	\$ 112.52	1735	4.2	\$ 0.06
	October	2009	\$ 120.92	\$ -	\$ 120.92	1872	4.4	\$ 0.06
	November	2009	\$ 124.52	\$ -	\$ 124.52	1950	4.4	\$ 0.06
Dec-Jan Estimated	December	2009	\$ 141.97	\$ -	\$ 141.97	2187	5.6	\$ 0.06
	January	2010	\$ 148.08	\$ -	\$ 148.08	2271	6.7	\$ 0.07
	February	2010	\$ 141.22	\$ -	\$ 141.22	2080	5.0	\$ 0.07
	March	2010	\$ 175.72	\$ -	\$ 175.72	2651	6.7	\$ 0.07
	April	2010	\$ 178.77	\$ -	\$ 178.77	2440	6.4	\$ 0.07
	May	2010	\$ 161.45	\$ -	\$ 161.45	1990	9.7	\$ 0.08
June-July Estimated	June	2010	\$ 130.35	\$ -	\$ 130.35	1694	4.5	\$ 0.08
	July	2010	\$ 124.55	\$ -	\$ 124.55	1475	6.7	\$ 0.08
	August	2010	\$ 103.89	\$ -	\$ 103.89	1398	4.3	\$ 0.07
Not Consecutive	September	2010	\$ 64.20	\$ -	\$ 64.20	741	3.8	\$ 0.07

Month	Combined (KWH)	Demand (KW)
January	2271	7
February	2080	5
March	2651	7
April	2174	6
May	1928	7
June	1728	5
July	1673	6
August	1617	5
September	1735	4
October	1872	4
November	1950	4
December	2187	6
Total	23866	



Electric Bills for Plots - Water Pollution Control - Tyler								
			CL & P Delivery Charges Ac # 51784793051 Meter # 820971542	0 Supply Charges Ac #				
Comments	Month	Year			Total Electric Charges	Total KWH	Measured Demand	Cost Per kWh
Not Consecutive June-July Estimated	March	2009	\$ 89.98	\$ -	\$ 89.98	1024	9.6	\$ 0.08
	April	2009	\$ 159.07	\$ -	\$ 159.07	1857	9.0	\$ 0.08
	May	2009	\$ 148.85	\$ -	\$ 148.85	1752	6.6	\$ 0.08
	June	2009	\$ 135.76	\$ -	\$ 135.76	1661	7.2	\$ 0.08
	July	2009	\$ 129.38	\$ -	\$ 129.38	1706	6.0	\$ 0.08
	August	2009	\$ 126.17	\$ -	\$ 126.17	1588	5.5	\$ 0.08
	September	2009	\$ 130.66	\$ -	\$ 130.66	1608	6.1	\$ 0.08
	October	2009	\$ 146.05	\$ -	\$ 146.05	1942	6.1	\$ 0.08
	November	2009	\$ 148.88	\$ -	\$ 148.88	2026	6.4	\$ 0.08
Dec-Jan Estimated	December	2009	\$ 167.91	\$ -	\$ 167.91	2210	7.5	\$ 0.08
	January	2010	\$ 172.95	\$ -	\$ 172.95	2260	9.4	\$ 0.08
	February	2010	\$ 186.96	\$ -	\$ 186.96	2127	6.4	\$ 0.09
Not Consecutive June-July Estimated	March	2010	\$ 250.38	\$ -	\$ 250.38	2567	13.7	\$ 0.10
	April	2010	\$ 167.35	\$ -	\$ 167.35	1797	11.7	\$ 0.09
	May	2010	\$ 122.30	\$ -	\$ 122.30	1159	4.9	\$ 0.11
	June	2010	\$ 127.68	\$ -	\$ 127.68	1289	7.5	\$ 0.10
	July	2010	\$ 129.03	\$ -	\$ 129.03	1397	5.0	\$ 0.09
	August	2010	\$ 138.72	\$ -	\$ 138.72	1464	7.4	\$ 0.09
	September	2010	\$ 69.86	\$ -	\$ 69.86	789	6.4	\$ 0.09
	October	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
Not Consecutive	November	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!
Not Consecutive	December	2010	\$ -	\$ -	\$ -	0	0.0	#DIV/0!

Month	Combined (KWH)	Demand (KW)
January	2260	9
February	2127	6
March	2567	14
April	1827	10
May	1456	6
June	1475	7
July	1551	6
August	1526	6
September	1608	6
October	1942	6
November	2026	6
December	2210	8
Total	22576	



APPENDIX B

STATEMENT OF ENERGY PERFORMANCE

PORTFOLIO MANAGER REFERENCE SHEET



STATEMENT OF ENERGY PERFORMANCE

Bristol CT - City Hall

Building ID: 2478708
For 12-month Period Ending: April 30, 2010¹
Date SEP becomes ineligible: N/A

Date SEP Generated: October 14, 2010

Facility

Bristol CT - City Hall
 111 North Main Street
 Bristol, CT 06010

Facility Owner

City of Bristol CT
 111 North Main Street
 Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
 111 North Main Street
 Bristol, CT 06010

Year Built: 1963

Gross Floor Area (ft²): 72,000

Energy Performance Rating² (1-100) 71

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	2,663,493
Natural Gas (kBtu) ⁴	163,737
Total Energy (kBtu)	2,827,230

Energy Intensity⁵

Site (kBtu/ft ² /yr)	79
Source (kBtu/ft ² /yr)	166

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	551

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	102
National Average Source EUI	215
% Difference from National Average Source EUI	-22%
Building Type	Office

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
 15 British American Blvd
 Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol CT - City Hall	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Office	Is this an accurate description of the space in question?		☐
Location	111 North Main Street, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
City Hall (Office)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	72,000 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Weekly operating hours	40 Hours	Is this the total number of hours per week that the Office space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	166 (Default)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100. The normal worker density ranges between 0.3 and 5.3 workers per 1000 square feet (92.8 square meters)		☐
Number of PCs	158 (Default)	Is this the number of personal computers in the Office?		☐
Percent Cooled	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 51254653009 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
03/19/2010	04/18/2010	56,832.00
02/19/2010	03/18/2010	38,016.00
01/19/2010	02/18/2010	79,488.00
12/19/2009	01/18/2010	22,743.00
11/19/2009	12/18/2009	71,424.00
10/19/2009	11/18/2009	33,408.00
09/19/2009	10/18/2009	90,240.00
08/19/2009	09/18/2009	90,240.00
07/19/2009	08/18/2009	92,544.00
06/19/2009	07/18/2009	87,936.00
05/19/2009	06/18/2009	56,832.00
51254653009 Consumption (kWh (thousand Watt-hours))		719,703.00
51254653009 Consumption (kBtu (thousand Btu))		2,455,626.64
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		2,455,626.64
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Natural Gas		
Meter: Gas Service (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
03/20/2010	04/19/2010	32.00
02/20/2010	03/19/2010	200.00
01/20/2010	02/19/2010	409.00
12/20/2009	01/19/2010	750.00
11/20/2009	12/19/2009	215.00
10/20/2009	11/19/2009	31.00
09/20/2009	10/19/2009	0.00
08/20/2009	09/19/2009	0.00
07/20/2009	08/19/2009	0.00
06/20/2009	07/19/2009	0.00
05/20/2009	06/19/2009	0.00

Gas Service Consumption (therms)	1,637.00
Gas Service Consumption (kBtu (thousand Btu))	163,700.00
Total Natural Gas Consumption (kBtu (thousand Btu))	163,700.00
Is this the total Natural Gas consumption at this building including all Natural Gas meters?	☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol CT - City Hall
111 North Main Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol CT - City Hall	
Gross Floor Area Excluding Parking: (ft ²)	72,000
Year Built	1963
For 12-month Evaluation Period Ending Date:	April 30, 2010

Facility Space Use Summary

City Hall	
Space Type	Office
Gross Floor Area(ft ²)	72,000
Weekly operating hours	40
Workers on Main Shift ^d	166
Number of PCs ^d	158
Percent Cooled	50% or more
Percent Heated	50% or more

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 04/30/2010)	Baseline (Ending Date 04/30/2010)	Rating of 75	Target	National Average
Energy Performance Rating	71	71	75	N/A	50
Energy Intensity					
Site (kBtu/ft ²)	79	79	76	N/A	102
Source (kBtu/ft ²)	166	166	159	N/A	215
Energy Cost					
\$/year	\$ 83,565.65	\$ 83,565.65	\$ 79,768.65	N/A	\$ 107,845.36
\$/ft ² /year	\$ 1.16	\$ 1.16	\$ 1.11	N/A	\$ 1.50
Greenhouse Gas Emissions					
MtCO ₂ e/year	551	551	526	N/A	711
kgCO ₂ e/ft ² /year	8	8	8	N/A	10

More than 50% of your building is defined as Office. Please note that your rating accounts for all of the spaces listed. The National Average column presents energy performance data your building would have if your building had an average rating of 50.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.

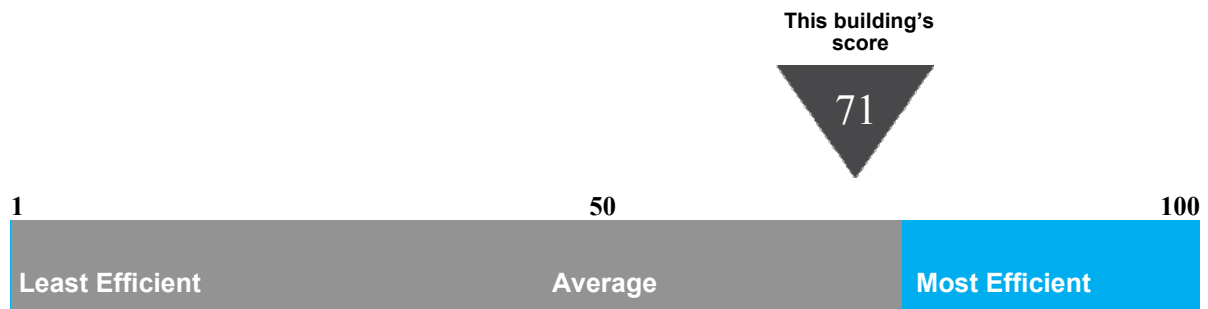
Statement of Energy Performance

2010

Bristol CT - City Hall
111 North Main Street
Bristol, CT 06010

Portfolio Manager Building ID: 2478708

The energy use of this building has been measured and compared to other similar buildings using the Environmental Protection Agency's (EPA's) Energy Performance Scale of 1–100, with 1 being the least energy efficient and 100 the most energy efficient. For more information, visit energystar.gov/benchmark.



This building uses 166 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending April 2010

Buildings with a score of
75 or higher may qualify
for EPA's ENERGY STAR.

I certify that the information contained within this statement is accurate and in accordance with U.S. Environmental Protection Agency's measurement standards, found at energystar.gov

Date of certification





STATEMENT OF ENERGY PERFORMANCE

Bristol, CT- City Hall Annex Garage

Building ID: 2478726

For 12-month Period Ending: August 31, 2010

Date SEP becomes ineligible: N/A

Date SEP Generated: October 14, 2010

Facility

Bristol, CT- City Hall Annex Garage
111 North Main Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1965

Gross Floor Area (ft²): 2,250Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	22,231
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	22,231

Energy Intensity⁵

Site (kBtu/ft ² /yr)	10
Source (kBtu/ft ² /yr)	33

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	3

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	25
National Average Source EUI	56
% Difference from National Average Source EUI	-41%
Building Type	Storage/Shipping/Non-Refrigerated Warehouse

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT- City Hall Annex Garage	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Storage/Shipping/Non-Refrigerated Warehouse	Is this an accurate description of the space in question?		☐
Location	111 North Main Street, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
City Hall Annex (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	2,250 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	40Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	2(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 891029692 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/18/2010	08/17/2010	266.00
06/18/2010	07/17/2010	259.00
05/18/2010	06/17/2010	299.00
04/18/2010	05/17/2010	339.00
03/18/2010	04/17/2010	501.00
02/18/2010	03/17/2010	510.00
01/18/2010	02/17/2010	652.00
12/18/2009	01/17/2010	788.00
11/18/2009	12/17/2009	580.00
10/18/2009	11/17/2009	882.00
09/18/2009	10/17/2009	998.00
891029692 Consumption (kWh (thousand Watt-hours))		6,074.00
891029692 Consumption (kBtu (thousand Btu))		20,724.49
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		20,724.49
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT- City Hall Annex Garage
111 North Main Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT- City Hall Annex Garage	
Gross Floor Area Excluding Parking: (ft ²)	2,250
Year Built	1965
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

City Hall Annex	
Space Type	Other - Storage/Shipping/Non-Refrigerated Warehouse
Gross Floor Area(ft ²)	2,250
Number of PCs ^a	0
Weekly operating hours ^a	40
Workers on Main Shift ^a	2

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	10	10	0	N/A	25
Source (kBtu/ft ²)	33	33	0	N/A	56
Energy Cost					
\$/year	\$ 630.26	\$ 630.26	N/A	N/A	\$ 1,594.79
\$/ft ² /year	\$ 0.28	\$ 0.28	N/A	N/A	\$ 0.71
Greenhouse Gas Emissions					
MtCO ₂ e/year	3	3	0	N/A	8
kgCO ₂ e/ft ² /year	1	1	0	N/A	3

More than 50% of your building is defined as Storage/Shipping/Non-Refrigerated Warehouse. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Storage/Shipping/Non-Refrigerated Warehouse. This building uses X% less energy per square foot than the CBECS national average for Storage/Shipping/Non-Refrigerated Warehouse.

Notes:

- o - This attribute is optional.
- d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Water Dept Main Office & Garage

Building ID: 2478759

For 12-month Period Ending: March 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: November 05, 2010

Facility

Bristol, CT - Water Dept Main Office &
Garage
119 Riverside Avenue
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1926

Gross Floor Area (ft²): 7,600Energy Performance Rating² (1-100) 70**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu) 210,002

Natural Gas - (kBtu)⁴ 0

Total Energy (kBtu) 210,002

Energy Intensity⁵Site (kBtu/ft²/yr) 53Source (kBtu/ft²/yr) 118**Emissions (based on site energy use)**Greenhouse Gas Emissions (MtCO₂e/year) 40**Electric Distribution Utility**

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI 67

National Average Source EUI 149

% Difference from National Average Source EUI -21%

Building Type Office

Stamp of Certifying Professional

Based on the conditions observed at the
time of my visit to this building, I certify that
the information contained within this
statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality N/A

Acceptable Thermal Environmental Conditions N/A

Adequate Illumination N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Water Dept Main Office & Garage	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Office	Is this an accurate description of the space in question?		☐
Location	119 Riverside Avenue, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Water Dept Office (Office)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	7,600 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Weekly operating hours	40 Hours	Is this the total number of hours per week that the Office space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	15	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100. The normal worker density ranges between 0.3 and 5.3 workers per 1000 square feet (92.8 square meters)		☐
Number of PCs	20	Is this the number of personal computers in the Office?		☐
Percent Cooled	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 280129272 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
02/18/2010	03/17/2010	4,221.00
01/18/2010	02/17/2010	4,553.00
12/18/2009	01/17/2010	5,353.00
11/18/2009	12/17/2009	4,176.00
10/18/2009	11/17/2009	4,142.00
09/18/2009	10/17/2009	4,524.00
08/18/2009	09/17/2009	6,567.00
07/18/2009	08/17/2009	7,034.00
06/18/2009	07/17/2009	6,299.00
05/18/2009	06/17/2009	4,949.00
04/18/2009	05/17/2009	4,613.00
280129272 Consumption (kWh (thousand Watt-hours))		56,431.00
280129272 Consumption (kBtu (thousand Btu))		192,542.57
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		192,542.57
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Water Dept Main Office & Garage
119 Riverside Avenue
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT - Water Dept Main Office & Garage	
Gross Floor Area Excluding Parking: (ft ²)	7,600
Year Built	1926
For 12-month Evaluation Period Ending Date:	March 31, 2010

Facility Space Use Summary

Water Dept Office	
Space Type	Office
Gross Floor Area(ft ²)	7,600
Weekly operating hours	40
Workers on Main Shift	15
Number of PCs	20
Percent Cooled	50% or more
Percent Heated	50% or more

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 03/31/2010)	Baseline (Ending Date 03/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	70	70	75	N/A	50
Energy Intensity					
Site (kBtu/ft ²)	53	53	49	N/A	67
Source (kBtu/ft ²)	118	118	110	N/A	149
Energy Cost					
\$/year	\$ 7,042.77	\$ 7,042.77	\$ 6,618.65	N/A	\$ 8,949.29
\$/ft ² /year	\$ 0.93	\$ 0.93	\$ 0.87	N/A	\$ 1.18
Greenhouse Gas Emissions					
MtCO ₂ e/year	40	40	38	N/A	51
kgCO ₂ e/ft ² /year	5	5	5	N/A	6

More than 50% of your building is defined as Office. Please note that your rating accounts for all of the spaces listed. The National Average column presents energy performance data your building would have if your building had an average rating of 50.

Notes:

- o - This attribute is optional.
- d - A default value has been supplied by Portfolio Manager.

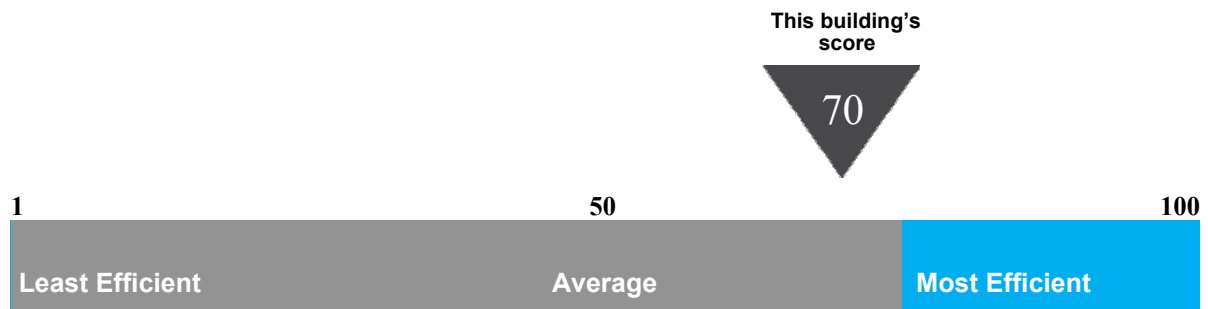
Statement of Energy Performance

2010

Bristol, CT - Water Dept Main Office & Garage
119 Riverside Avenue
Bristol, CT 06010

Portfolio Manager Building ID: 2478759

The energy use of this building has been measured and compared to other similar buildings using the Environmental Protection Agency's (EPA's) Energy Performance Scale of 1–100, with 1 being the least energy efficient and 100 the most energy efficient. For more information, visit energystar.gov/benchmark.



This building uses 118 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending March 2010

Buildings with a score of
75 or higher may qualify
for EPA's ENERGY STAR.

I certify that the information contained within this statement is accurate and in accordance with U.S.
Environmental Protection Agency's measurement standards, found at energystar.gov

Date of certification





STATEMENT OF ENERGY PERFORMANCE

Bristol CT - Water Filtration Plant

Building ID: 2480300

For 12-month Period Ending: February 28, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: November 01, 2010

Facility

Bristol CT - Water Filtration Plant
1080 Terryville Road
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1988

Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	4,659,611
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	4,659,611

Energy Intensity⁵

Site (kBtu/gpd)	1
Source (kBtu/gpd)	3

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	728

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	2
National Average Source EUI	8
% Difference from National Average Source EUI	-65%
Building Type	Water Treatment

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol CT - Water Filtration Plant	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Water Treatment	Is this an accurate description of the space in question?		☐
Location	1080 Terryville Road, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Water Utility/Wastewater Plant	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Water Treatment Plant (Water Treatment and Distribution Utility)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 890376902 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
01/18/2010	02/17/2010	101,760.00
12/18/2009	01/17/2010	125,568.00
11/18/2009	12/17/2009	100,608.00
10/18/2009	11/17/2009	94,080.00
09/18/2009	10/17/2009	124,032.00
08/18/2009	09/17/2009	144,768.00
07/18/2009	08/17/2009	125,568.00
06/18/2009	07/17/2009	130,560.00
05/18/2009	06/17/2009	116,352.00
04/18/2009	05/17/2009	97,536.00
03/18/2009	04/17/2009	102,144.00
890376902 Consumption (kWh (thousand Watt-hours))		1,262,976.00
890376902 Consumption (kBtu (thousand Btu))		4,309,274.11
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		4,309,274.11
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Flow Type: Average Flow Meter		
Meter Name: Average Flow Meter		
Start Date	End Date	Average Flow (MGD (million gallons per day))
01/18/2010	02/17/2010	6.00
12/18/2009	01/17/2010	6.00
11/18/2009	12/17/2009	6.00
10/18/2009	11/17/2009	6.00

09/18/2009	10/17/2009	6.00
08/18/2009	09/17/2009	6.00
07/18/2009	08/17/2009	10.00
06/18/2009	07/17/2009	10.00
05/18/2009	06/17/2009	6.00
04/18/2009	05/17/2009	6.00
03/18/2009	04/17/2009	6.00
Total Flow (MGD)		74.00

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP) and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

General Information:

Bristol CT - Water Filtration Plant	
Year Built	1988
For 12-month Evaluation Period Ending Date:	February 28, 2010

Facility Space Use Summary

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	Current (Ending Date: 02/28/2010)	Baseline (Ending Date: 02/28/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/gpd)	1	1	0	N/A	2
Source (kBtu/gpd)	3	3	0	N/A	8
Energy Cost					
\$/year	\$ 78,595	\$ 78,595	N/A	N/A	\$ 149,705
\$/mgpd/year	\$12,301.57	\$12,301.57	N/A	N/A	\$23,431.56
Greenhouse Gas Emissions					
MtCO ₂ e/year	728	728	0	N/A	1,387
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A



STATEMENT OF ENERGY PERFORMANCE

Well House #2

Building ID: 2494986

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: November 04, 2010

Facility

Well House #2
Mechanic Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 2002**Gross Floor Area (ft²):** 256**Energy Performance Rating² (1-100)** N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	846,976
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	846,976

Energy Intensity⁵

Site (kBtu/ft ² /yr)	3309
Source (kBtu/ft ² /yr)	11050

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	105

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	5088%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Well House #2	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Mechanic Street, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Well House #2 (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	256 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 890867202 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/15/2010	08/14/2010	34,910.00
06/15/2010	07/14/2010	32,610.00
05/15/2010	06/14/2010	7,460.00
04/15/2010	05/14/2010	10,660.00
03/15/2010	04/14/2010	21,440.00
02/15/2010	03/14/2010	21,000.00
01/15/2010	02/14/2010	20,750.00
12/15/2009	01/14/2010	26,820.00
11/15/2009	12/14/2009	14,190.00
10/15/2009	11/14/2009	11,720.00
09/15/2009	10/14/2009	18,020.00
890867202 Consumption (kWh (thousand Watt-hours))		219,580.00
890867202 Consumption (kBtu (thousand Btu))		749,206.96
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		749,206.96
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building?
Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.

☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.

☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Well House #2
Mechanic Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Well House #2	
Gross Floor Area Excluding Parking: (ft ²)	256
Year Built	2002
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Well House #2	
Space Type	Other - Other
Gross Floor Area(ft ²)	256
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	3309	3309	0	N/A	104
Source (kBtu/ft ²)	11050	11050	0	N/A	213
Energy Cost					
\$/year	\$ 18,970.71	\$ 18,970.71	N/A	N/A	\$ 596.33
\$/ft ² /year	\$ 74.10	\$ 74.10	N/A	N/A	\$ 2.33
Greenhouse Gas Emissions					
MtCO ₂ e/year	105	105	0	N/A	3
kgCO ₂ e/ft ² /year	411	411	0	N/A	13

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Well House #1

Building ID: 2494983
 For 12-month Period Ending: July 31, 2010¹
 Date SEP becomes ineligible: N/A

Date SEP Generated: November 04, 2010

Facility

Well House #1
 Barlowe Street
 Bristol, CT 06010

Facility Owner

City of Bristol CT
 111 North Main Street
 Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
 111 North Main Street
 Bristol, CT 06010

Year Built: 1948

Gross Floor Area (ft²): 252

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	69,738
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	69,738

Energy Intensity⁵

Site (kBtu/ft ² /yr)	277
Source (kBtu/ft ² /yr)	924

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	9

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	334%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
 15 British American Blvd
 Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Well House #1	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Barlowe Street, Bristol , CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Well House #1 (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	252 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 886100742 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
06/19/2010	07/18/2010	3,902.00
05/19/2010	06/18/2010	920.00
04/19/2010	05/18/2010	680.00
03/19/2010	04/18/2010	640.00
02/19/2010	03/18/2010	1,280.00
01/19/2010	02/18/2010	1,800.00
12/19/2009	01/18/2010	2,240.00
11/19/2009	12/18/2009	280.00
10/19/2009	11/18/2009	2,276.00
09/19/2009	10/18/2009	2,129.00
08/19/2009	09/18/2009	2,203.00
886100742 Consumption (kWh (thousand Watt-hours))		18,350.00
886100742 Consumption (kBtu (thousand Btu))		62,610.20
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		62,610.20
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Well House #1
Barlowe Street
Bristol , CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Well House #1	
Gross Floor Area Excluding Parking: (ft ²)	252
Year Built	1948
For 12-month Evaluation Period Ending Date:	July 31, 2010

Facility Space Use Summary

Well House #1	
Space Type	Other - Other
Gross Floor Area(ft ²)	252
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 07/31/2010)	Baseline (Ending Date 07/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	277	277	0	N/A	104
Source (kBtu/ft ²)	924	924	0	N/A	213
Energy Cost					
\$/year	\$ 2,601.68	\$ 2,601.68	N/A	N/A	\$ 977.72
\$/ft ² /year	\$ 10.32	\$ 10.32	N/A	N/A	\$ 3.88
Greenhouse Gas Emissions					
MtCO ₂ e/year	9	9	0	N/A	3
kgCO ₂ e/ft ² /year	34	34	0	N/A	13

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Well House #3-5

Building ID: 2494989

For 12-month Period Ending: August 31, 2010

Date SEP becomes ineligible: N/A

Date SEP Generated: November 04, 2010

Facility

Well House #3-5
Mix Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1965

Gross Floor Area (ft²): 257Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	1,723,131
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	1,723,131

Energy Intensity⁵

Site (kBtu/ft ² /yr)	6705
Source (kBtu/ft ² /yr)	22394

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	214

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	10414%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Well House #3-5	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Mix Street, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Well House #3-5 (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	257 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 875932009 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/11/2010	08/10/2010	44,960.00
06/11/2010	07/10/2010	42,400.00
05/11/2010	06/10/2010	42,560.00
04/11/2010	05/10/2010	41,920.00
03/11/2010	04/10/2010	43,200.00
02/11/2010	03/10/2010	45,920.00
01/11/2010	02/10/2010	45,600.00
12/11/2009	01/10/2010	51,840.00
11/11/2009	12/10/2009	40,000.00
10/11/2009	11/10/2009	31,520.00
09/11/2009	10/10/2009	28,640.00
875932009 Consumption (kWh (thousand Watt-hours))		458,560.00
875932009 Consumption (kBtu (thousand Btu))		1,564,606.72
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		1,564,606.72
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Well House #3-5
Mix Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Well House #3-5	
Gross Floor Area Excluding Parking: (ft ²)	257
Year Built	1965
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Well House #3-5	
Space Type	Other - Other
Gross Floor Area(ft ²)	257
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	6705	6705	0	N/A	104
Source (kBtu/ft ²)	22394	22394	0	N/A	213
Energy Cost					
\$/year	\$ 23,406.32	\$ 23,406.32	N/A	N/A	\$ 363.06
\$/ft ² /year	\$ 91.08	\$ 91.08	N/A	N/A	\$ 1.41
Greenhouse Gas Emissions					
MtCO ₂ e/year	214	214	0	N/A	3
kgCO ₂ e/ft ² /year	833	833	0	N/A	13

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Pump & Control Bldg

Building ID: 2494991

For 12-month Period Ending: May 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: November 04, 2010

Facility

Pump & Control Bldg
Hill Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1966

Gross Floor Area (ft²): 1,050Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	348,947
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	348,947

Energy Intensity⁵

Site (kBtu/ft ² /yr)	332
Source (kBtu/ft ² /yr)	1110

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	43

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	421%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Pump & Control Bldg	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Hill Street, Bristol , CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Pump and Control (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	1,050 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 886091962 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
04/25/2010	05/24/2010	5,760.00
03/25/2010	04/24/2010	5,920.00
02/25/2010	03/24/2010	6,880.00
01/25/2010	02/24/2010	7,040.00
12/25/2009	01/24/2010	10,080.00
11/25/2009	12/24/2009	6,240.00
10/25/2009	11/24/2009	9,280.00
09/25/2009	10/24/2009	9,280.00
08/25/2009	09/24/2009	11,840.00
07/25/2009	08/24/2009	10,240.00
06/25/2009	07/24/2009	11,360.00
886091962 Consumption (kWh (thousand Watt-hours))		93,920.00
886091962 Consumption (kBtu (thousand Btu))		320,455.04
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		320,455.04
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building?
Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.

☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.

☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Pump & Control Bldg
Hill Street
Bristol , CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Pump & Control Bldg	
Gross Floor Area Excluding Parking: (ft ²)	1,050
Year Built	1966
For 12-month Evaluation Period Ending Date:	May 31, 2010

Facility Space Use Summary

Pump and Control	
Space Type	Other - Other
Gross Floor Area(ft ²)	1,050
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 05/31/2010)	Baseline (Ending Date 05/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	332	332	0	N/A	104
Source (kBtu/ft ²)	1110	1110	0	N/A	213
Energy Cost					
\$/year	\$ 15,752.14	\$ 15,752.14	N/A	N/A	\$ 4,929.51
\$/ft ² /year	\$ 15.00	\$ 15.00	N/A	N/A	\$ 4.69
Greenhouse Gas Emissions					
MtCO ₂ e/year	43	43	0	N/A	13
kgCO ₂ e/ft ² /year	41	41	0	N/A	13

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Pump & Control Bldg - Wolcott St

Building ID: 2494995
 For 12-month Period Ending: July 31, 2010¹
 Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility
 Pump & Control Bldg - Wolcott St
 Wolcott Street
 Bristol, CT 06010

Facility Owner
 N/A

Primary Contact for this Facility
 N/A

Year Built: 2006
Gross Floor Area (ft²): 610

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	88,469
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	88,469

Energy Intensity⁵

Site (kBtu/ft ² /yr)	145
Source (kBtu/ft ² /yr)	484

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	127%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Pump & Control Bldg - Wolcott St	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Wolcott Street, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Wolcott Street PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	610 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 890527152 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
06/27/2010	07/26/2010	1,295.00
05/27/2010	06/26/2010	1,509.00
04/27/2010	05/26/2010	1,399.00
03/27/2010	04/26/2010	1,958.00
02/27/2010	03/26/2010	3,771.00
01/27/2010	02/26/2010	4,596.00
12/27/2009	01/26/2010	2,946.00
11/27/2009	12/26/2009	2,882.00
10/27/2009	11/26/2009	1,462.00
09/27/2009	10/26/2009	877.00
08/27/2009	09/26/2009	1,092.00
890527152 Consumption (kWh (thousand Watt-hours))		23,787.00
890527152 Consumption (kBtu (thousand Btu))		81,161.24
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		81,161.24
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Pump & Control Bldg - Wolcott St
Wolcott Street
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

General Information

Pump & Control Bldg - Wolcott St	
Gross Floor Area Excluding Parking: (ft ²)	610
Year Built	2006
For 12-month Evaluation Period Ending Date:	July 31, 2010

Facility Space Use Summary

Wolcott Street PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	610
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 07/31/2010)	Baseline (Ending Date 07/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	145	145	0	N/A	104
Source (kBtu/ft ²)	484	484	0	N/A	213
Energy Cost					
\$/year	\$ 6,285.16	\$ 6,285.16	N/A	N/A	\$ 4,507.04
\$/ft ² /year	\$ 10.30	\$ 10.30	N/A	N/A	\$ 7.39
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Pump & Control Bldg - Peck Lane

Building ID: 2494994
For 12-month Period Ending: July 31, 2010¹
Date SEP becomes ineligible: N/A

Date SEP Generated: November 04, 2010

Facility

Pump & Control Bldg - Peck Lane
 Peck Lane
 Bristol, CT 06010

Facility Owner

City of Bristol CT
 111 North Main Street
 Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
 111 North Main Street
 Bristol, CT 06010

Year Built: 2001

Gross Floor Area (ft²): 864

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	304,446
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	304,446

Energy Intensity⁵

Site (kBtu/ft ² /yr)	352
Source (kBtu/ft ² /yr)	1177

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	38

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	453%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
 15 British American Blvd
 Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Pump & Control Bldg - Peck Lane	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Peck Lane, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Peck Lane PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	864 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 889149882 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
06/27/2010	07/26/2010	6,880.00
05/27/2010	06/26/2010	6,120.00
04/27/2010	05/26/2010	5,360.00
03/27/2010	04/26/2010	7,250.00
02/27/2010	03/26/2010	8,270.00
01/27/2010	02/26/2010	9,490.00
12/27/2009	01/26/2010	9,940.00
11/27/2009	12/26/2009	10,390.00
10/27/2009	11/26/2009	6,940.00
09/27/2009	10/26/2009	6,310.00
08/27/2009	09/26/2009	4,980.00
889149882 Consumption (kWh (thousand Watt-hours))		81,930.00
889149882 Consumption (kBtu (thousand Btu))		279,545.16
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		279,545.16
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building?
Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.

☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.

☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Pump & Control Bldg - Peck Lane
Peck Lane
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Pump & Control Bldg - Peck Lane	
Gross Floor Area Excluding Parking: (ft ²)	864
Year Built	2001
For 12-month Evaluation Period Ending Date:	July 31, 2010

Facility Space Use Summary

Peck Lane PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	864
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 07/31/2010)	Baseline (Ending Date 07/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	352	352	0	N/A	104
Source (kBtu/ft ²)	1177	1177	0	N/A	213
Energy Cost					
\$/year	\$ 8,793.85	\$ 8,793.85	N/A	N/A	\$ 2,595.45
\$/ft ² /year	\$ 10.18	\$ 10.18	N/A	N/A	\$ 3.00
Greenhouse Gas Emissions					
MtCO ₂ e/year	38	38	0	N/A	11
kgCO ₂ e/ft ² /year	44	44	0	N/A	13

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Police/Court Complex

Building ID: 2478765
 For 12-month Period Ending: April 30, 2010¹
 Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility
 Bristol, CT - Police/Court Complex
 131 North Main Street
 Bristol, CT 06010

Facility Owner
 N/A

Primary Contact for this Facility
 N/A

Year Built: 1979
Gross Floor Area (ft²): 68,077

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	3,981,541
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	3,981,541

Energy Intensity⁵

Site (kBtu/ft ² /yr)	124
Source (kBtu/ft ² /yr)	261

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	78
National Average Source EUI	157
% Difference from National Average Source EUI	66%
Building Type	Fire Station/Police Station

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Police/Court Complex	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Fire Station/Police Station	Is this an accurate description of the space in question?		☐
Location	131 North Main Street, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Police Court Complex (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	68,077 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	100(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	168Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	40(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐
Parking Garage (Parking)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	48,360 Sq. Ft.	Is this the total square footage of the entire parking area (enclosed + nonenclosed + open floor area)?		☐
Enclosed Floor Area	22,906 Sq. Ft.	Is this the total square footage of the enclosed garage space? An enclosed garage is defined as having both sides and a roof.		☐
Non-Enclosed Floor Area (w/roof)	12,727 Sq. Ft.	Is this the total square footage of the nonenclosed garage space? This is typically defined as the portion of the garage above ground (contains no sides but is under a roof).		☐

Open Floor Area (w/o roof)	12,727 Sq. Ft.	Is this the total square footage of the nonenclosed parking area without a roof? This is typically defined as open parking lots or the very top level of an above ground parking garage.	☐
Weekly Hours of Access	168 Hours	Is this the total number of hours per week when it is possible for a vehicle to enter or exit?	☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 891790242 (kWh (thousand Watt-hours)) Space(s): Police Court Complex Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
03/19/2010	04/18/2010	92,160.00
02/19/2010	03/18/2010	87,840.00
01/19/2010	02/18/2010	89,280.00
12/19/2009	01/18/2010	103,680.00
11/19/2009	12/18/2009	90,720.00
10/19/2009	11/18/2009	61,200.00
09/19/2009	10/18/2009	110,160.00
08/19/2009	09/18/2009	110,160.00
07/19/2009	08/18/2009	110,160.00
06/19/2009	07/18/2009	120,960.00
05/19/2009	06/18/2009	99,360.00
891790242 Consumption (kWh (thousand Watt-hours))		1,075,680.00
891790242 Consumption (kBtu (thousand Btu))		3,670,220.16
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		3,670,220.16
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Police/Court Complex
131 North Main Street
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

General Information

Bristol, CT - Police/Court Complex	
Gross Floor Area Excluding Parking: (ft ²)	68,077
Year Built	1979
For 12-month Evaluation Period Ending Date:	April 30, 2010

Facility Space Use Summary

Police Court Complex		Parking Garage	
Space Type	Other - Fire Station/Police Station	Space Type	Parking
Gross Floor Area(ft ²)	68,077	Gross Floor Area(ft ²)	48,360
Number of PCs ^o	100	Enclosed Floor Area	22,906
Weekly operating hours ^o	168	Non-Enclosed Floor Area (w/roof)	12,727
Workers on Main Shift ^o	40	Open Floor Area (w/o roof)	12,727
		Weekly Hours of Access	168

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 04/30/2010)	Baseline (Ending Date 04/30/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	124	124	16	N/A	78
Source (kBtu/ft ²)	261	261	33	N/A	157
Energy Cost					
\$/year	\$ 98,534.63	\$ 98,534.63	\$ 12,360.60	N/A	\$ 62,081.59
\$/ft ² /year	\$ 1.45	\$ 1.45	\$ 0.18	N/A	\$ 0.91
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Fire Station/Police Station. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Fire Station/Police Station. This building uses X% less energy per square foot than the CBECS national average for Fire Station/Police Station.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - RW Park Service Building

Building ID: 2478768

For 12-month Period Ending: April 30, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility

Bristol, CT - RW Park Service Building
Page Park Road
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

Year Built: 1950**Gross Floor Area (ft²):** 2,741**Energy Performance Rating²** (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	86,380
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	86,380

Energy Intensity⁵

Site (kBtu/ft ² /yr)	129
Source (kBtu/ft ² /yr)	204

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	65
National Average Source EUI	136
% Difference from National Average Source EUI	50%
Building Type	Recreation

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - RW Park Service Building	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Recreation	Is this an accurate description of the space in question?		☐
Location	Page Park Road, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Rockwell Park (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	2,741 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	60Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	5(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 886989342 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
03/16/2010	04/15/2010	1,995.00
02/16/2010	03/15/2010	2,498.00
01/16/2010	02/15/2010	3,186.00
12/16/2009	01/15/2010	3,508.00
11/16/2009	12/15/2009	1,635.00
10/16/2009	11/15/2009	1,558.00
09/16/2009	10/15/2009	1,725.00
08/16/2009	09/15/2009	2,156.00
07/16/2009	08/15/2009	1,915.00
06/16/2009	07/15/2009	1,616.00
05/16/2009	06/15/2009	1,594.00
886989342 Consumption (kWh (thousand Watt-hours))		23,386.00
886989342 Consumption (kBtu (thousand Btu))		79,793.03
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		79,793.03
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - RW Park Service Building
Page Park Road
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

General Information

Bristol, CT - RW Park Service Building	
Gross Floor Area Excluding Parking: (ft ²)	2,741
Year Built	1950
For 12-month Evaluation Period Ending Date:	April 30, 2010

Facility Space Use Summary

Rockwell Park	
Space Type	Other - Recreation
Gross Floor Area(ft ²)	2,741
Number of PCs ^o	0
Weekly operating hours ^o	60
Workers on Main Shift ^o	5

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 04/30/2010)	Baseline (Ending Date 04/30/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	129	129	0	N/A	65
Source (kBtu/ft ²)	204	204	0	N/A	136
Energy Cost					
\$/year	\$ 8,027.24	\$ 8,027.24	N/A	N/A	\$ 4,044.11
\$/ft ² /year	\$ 2.93	\$ 2.93	N/A	N/A	\$ 1.48
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Recreation. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Recreation. This building uses X% less energy per square foot than the CBECS national average for Recreation.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol CT - Rockwell Pavilion

Building ID: 2483635

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility

Bristol CT - Rockwell Pavilion
Jacob St/Muzzy St.
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

Year Built: 1963**Gross Floor Area (ft²):** 2,625**Energy Performance Rating²** (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	1,036
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	1,036

Energy Intensity⁵

Site (kBtu/ft ² /yr)	71
Source (kBtu/ft ² /yr)	72

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	-66%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol CT - Rockwell Pavilion	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Jacob St/Muzzy St., Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Rockwell Pavilion (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	2,625 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 891388992 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/26/2010	08/25/2010	46.20
06/26/2010	07/25/2010	45.50
05/26/2010	06/25/2010	46.10
04/26/2010	05/25/2010	41.10
03/26/2010	04/25/2010	39.70
02/26/2010	03/25/2010	2.00
01/26/2010	02/25/2010	2.00
12/26/2009	01/25/2010	2.00
11/26/2009	12/25/2009	2.00
10/26/2009	11/25/2009	7.70
09/26/2009	10/25/2009	39.60
891388992 Consumption (kWh (thousand Watt-hours))		273.90
891388992 Consumption (kBtu (thousand Btu))		934.55
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		934.55
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol CT - Rockwell Pavilion
Jacob St/Muzzy St.
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

General Information

Bristol CT - Rockwell Pavilion	
Gross Floor Area Excluding Parking: (ft ²)	2,625
Year Built	1963
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Rockwell Pavilion	
Space Type	Other - Other
Gross Floor Area(ft ²)	2,625
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	71	71	0	N/A	104
Source (kBtu/ft ²)	72	72	0	N/A	213
Energy Cost					
\$/year	\$ 2,176.19	\$ 2,176.19	N/A	N/A	\$ 3,195.76
\$/ft ² /year	\$ 0.83	\$ 0.83	N/A	N/A	\$ 1.22
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Bathhouse

Building ID: 2478769

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility
Bristol, CT - Bathhouse
1 Rockwell Park Rd.
Bristol, CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1921

Gross Floor Area (ft²): 2,574Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	186,077
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	186,077

Energy Intensity⁵

Site (kBtu/ft ² /yr)	72
Source (kBtu/ft ² /yr)	241

Emissions (based on site energy use)
Greenhouse Gas Emissions (MtCO₂e/year)

N/A

Electric Distribution Utility
N/A

National Average Comparison

National Average Site EUI	25
National Average Source EUI	56
% Difference from National Average Source EUI	331%
Building Type	Storage/Shipping/Non-Refrigerated Warehouse

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional
N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Bathhouse	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Storage/Shipping/Non-Refrigerated Warehouse	Is this an accurate description of the space in question?		☐
Location	1 Rockwell Park Rd., Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Bathhouse (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	2,574 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	40Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	2(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 891581942 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/26/2010	08/25/2010	6,948.00
06/26/2010	07/25/2010	7,331.00
05/26/2010	06/25/2010	4,253.00
04/26/2010	05/25/2010	2,096.00
03/26/2010	04/25/2010	2,468.00
02/26/2010	03/25/2010	3,812.00
01/26/2010	02/25/2010	5,073.00
12/26/2009	01/25/2010	4,849.00
11/26/2009	12/25/2009	6,268.00
10/26/2009	11/25/2009	4,079.00
09/26/2009	10/25/2009	3,143.00
891581942 Consumption (kWh (thousand Watt-hours))		50,320.00
891581942 Consumption (kBtu (thousand Btu))		171,691.84
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		171,691.84
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility
Bristol, CT - Bathhouse
1 Rockwell Park Rd.
Bristol, CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Bristol, CT - Bathhouse	
Gross Floor Area Excluding Parking: (ft ²)	2,574
Year Built	1921
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Bathhouse	
Space Type	Other - Storage/Shipping/Non-Refrigerated Warehouse
Gross Floor Area(ft ²)	2,574
Number of PCs ^a	0
Weekly operating hours ^a	40
Workers on Main Shift ^a	2

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	72	72	0	N/A	25
Source (kBtu/ft ²)	241	241	0	N/A	56
Energy Cost					
\$/year	\$ 10,182.47	\$ 10,182.47	N/A	N/A	\$ 3,521.40
\$/ft ² /year	\$ 3.96	\$ 3.96	N/A	N/A	\$ 1.37
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Storage/Shipping/Non-Refrigerated Warehouse. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Storage/Shipping/Non-Refrigerated Warehouse. This building uses X% less energy per square foot than the CBECS national average for Storage/Shipping/Non-Refrigerated Warehouse.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Muzzy Field

Building ID: 2478774
 For 12-month Period Ending: July 31, 2010
 Date SEP becomes ineligible: N/A

Date SEP Generated: October 18, 2010

Facility
 Bristol, CT - Muzzy Field
 Muzzy Street
 Bristol, CT 06010

Facility Owner
 City of Bristol CT
 111 North Main Street
 Bristol, CT 06010

Primary Contact for this Facility
 Roger Rousseau
 111 North Main Street
 Bristol, CT 06010

Year Built: 1922
Gross Floor Area (ft²): 1,000

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	231,708
Natural Gas (kBtu) ⁴	10,777
Total Energy (kBtu)	242,485

Energy Intensity⁵

Site (kBtu/ft ² /yr)	242
Source (kBtu/ft ² /yr)	785

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	29

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	65
National Average Source EUI	136
% Difference from National Average Source EUI	477%
Building Type	Recreation

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
 15 British American Blvd
 Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Muzzy Field	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Recreation	Is this an accurate description of the space in question?		☐
Location	Muzzy Street, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Muzzy Field (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	1,000 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	2(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	60Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	10(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 891980632 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
06/19/2010	07/18/2010	7,840.00
05/19/2010	06/18/2010	14,720.00
04/19/2010	05/18/2010	8,800.00
03/19/2010	04/18/2010	2,080.00
02/19/2010	03/18/2010	3,840.00
01/19/2010	02/18/2010	4,000.00
12/19/2009	01/18/2010	860.00
11/19/2009	12/18/2009	800.00
10/19/2009	11/18/2009	4,160.00
09/19/2009	10/18/2009	10,400.00
08/19/2009	09/18/2009	5,920.00
891980632 Consumption (kWh (thousand Watt-hours))		63,420.00
891980632 Consumption (kBtu (thousand Btu))		216,389.04
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		216,389.04
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Natural Gas		
Meter: Gas Service (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
06/19/2010	07/18/2010	16.00
05/19/2010	06/18/2010	11.00
04/19/2010	05/18/2010	7.00
03/19/2010	04/18/2010	0.00
02/19/2010	03/18/2010	0.00
01/19/2010	02/18/2010	0.00
12/19/2009	01/18/2010	0.00
11/19/2009	12/18/2009	12.00
10/19/2009	11/18/2009	19.00
09/19/2009	10/18/2009	19.00
08/19/2009	09/18/2009	13.00

Gas Service Consumption (therms)	97.00
Gas Service Consumption (kBtu (thousand Btu))	9,700.00
Total Natural Gas Consumption (kBtu (thousand Btu))	9,700.00
Is this the total Natural Gas consumption at this building including all Natural Gas meters?	☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Muzzy Field
Muzzy Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT - Muzzy Field	
Gross Floor Area Excluding Parking: (ft ²)	1,000
Year Built	1922
For 12-month Evaluation Period Ending Date:	July 31, 2010

Facility Space Use Summary

Muzzy Field	
Space Type	Other - Recreation
Gross Floor Area(ft ²)	1,000
Number of PCs°	2
Weekly operating hours°	60
Workers on Main Shift°	10

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 07/31/2010)	Baseline (Ending Date 07/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	242	242	0	N/A	65
Source (kBtu/ft ²)	785	785	0	N/A	136
Energy Cost					
\$/year	\$ 28,267.00	\$ 28,267.00	N/A	N/A	\$ 7,577.35
\$/ft ² /year	\$ 28.27	\$ 28.27	N/A	N/A	\$ 7.58
Greenhouse Gas Emissions					
MtCO ₂ e/year	29	29	0	N/A	8
kgCO ₂ e/ft ² /year	29	29	0	N/A	8

More than 50% of your building is defined as Recreation. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Recreation. This building uses X% less energy per square foot than the CBECS national average for Recreation.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Ski Lodge

Building ID: 2478777

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility
Bristol, CT - Ski Lodge
1 Page Park Road
Bristol, CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1960
Gross Floor Area (ft²): 665

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	42,568
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	42,568

Energy Intensity⁵

Site (kBtu/ft ² /yr)	64
Source (kBtu/ft ² /yr)	214

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	65
National Average Source EUI	136
% Difference from National Average Source EUI	57%
Building Type	Recreation

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Ski Lodge	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Recreation	Is this an accurate description of the space in question?		☐
Location	1 Page Park Road, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Ski Lodge (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	665 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	5(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	80Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	10(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 890947292 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/15/2010	08/14/2010	133.00
06/15/2010	07/14/2010	242.00
05/15/2010	06/14/2010	429.00
04/15/2010	05/14/2010	575.00
03/15/2010	04/14/2010	951.00
02/15/2010	03/14/2010	2,193.00
01/15/2010	02/14/2010	2,512.00
12/15/2009	01/14/2010	2,678.00
11/15/2009	12/14/2009	1,071.00
10/15/2009	11/14/2009	896.00
09/15/2009	10/14/2009	238.00
890947292 Consumption (kWh (thousand Watt-hours))		11,918.00
890947292 Consumption (kBtu (thousand Btu))		40,664.22
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		40,664.22
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Ski Lodge
1 Page Park Road
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

General Information

Bristol, CT - Ski Lodge	
Gross Floor Area Excluding Parking: (ft ²)	665
Year Built	1960
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Ski Lodge	
Space Type	Other - Recreation
Gross Floor Area(ft ²)	665
Number of PCs ^o	5
Weekly operating hours ^o	80
Workers on Main Shift ^o	10

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	64	64	0	N/A	65
Source (kBtu/ft ²)	214	214	0	N/A	136
Energy Cost					
\$/year	\$ 2,491.49	\$ 2,491.49	N/A	N/A	\$ 2,530.02
\$/ft ² /year	\$ 3.75	\$ 3.75	N/A	N/A	\$ 3.81
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Recreation. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Recreation. This building uses X% less energy per square foot than the CBECS national average for Recreation.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Page Park Pavilion

Building ID: 2478785

For 12-month Period Ending: April 30, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility

Bristol, CT - Page Park Pavilion
1 Orchard Park Road
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

Year Built: 1963**Gross Floor Area (ft²):** 2,943**Energy Performance Rating²** (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	13,648
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	13,648

Energy Intensity⁵

Site (kBtu/ft ² /yr)	177
Source (kBtu/ft ² /yr)	190

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	65
National Average Source EUI	136
% Difference from National Average Source EUI	39%
Building Type	Recreation

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Page Park Pavilion	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Recreation	Is this an accurate description of the space in question?		☐
Location	1 Orchard Park Road, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Page Park Pavilion (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	2,943 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	1(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	60Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	2(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 886968632 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
03/16/2010	04/15/2010	272.00
02/16/2010	03/15/2010	373.00
01/16/2010	02/15/2010	522.00
12/16/2009	01/15/2010	529.00
11/16/2009	12/15/2009	365.00
10/16/2009	11/15/2009	386.00
09/16/2009	10/15/2009	124.00
08/16/2009	09/15/2009	39.00
07/16/2009	08/15/2009	507.00
06/16/2009	07/15/2009	500.00
05/16/2009	06/15/2009	128.00
886968632 Consumption (kWh (thousand Watt-hours))		3,745.00
886968632 Consumption (kBtu (thousand Btu))		12,777.94
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		12,777.94
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Page Park Pavilion
1 Orchard Park Road
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

General Information

Bristol, CT - Page Park Pavilion	
Gross Floor Area Excluding Parking: (ft ²)	2,943
Year Built	1963
For 12-month Evaluation Period Ending Date:	April 30, 2010

Facility Space Use Summary

Page Park Pavilion	
Space Type	Other - Recreation
Gross Floor Area(ft ²)	2,943
Number of PCs ^o	1
Weekly operating hours ^o	60
Workers on Main Shift ^o	2

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 04/30/2010)	Baseline (Ending Date 04/30/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	177	177	0	N/A	65
Source (kBtu/ft ²)	190	190	0	N/A	136
Energy Cost					
\$/year	\$ 7,208.04	\$ 7,208.04	N/A	N/A	\$ 2,648.07
\$/ft ² /year	\$ 2.45	\$ 2.45	N/A	N/A	\$ 0.90
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Recreation. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Recreation. This building uses X% less energy per square foot than the CBECS national average for Recreation.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Recreation Building

Building ID: 2478781

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility

Bristol, CT - Recreation Building
3 Page Park Road
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

Year Built: 1955**Gross Floor Area (ft²):** 2,671**Energy Performance Rating²** (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	2,902
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	2,902

Energy Intensity⁵

Site (kBtu/ft ² /yr)	1
Source (kBtu/ft ² /yr)	4

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	65
National Average Source EUI	136
% Difference from National Average Source EUI	-97%
Building Type	Recreation

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Recreation Building	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Recreation	Is this an accurate description of the space in question?		☐
Location	3 Page Park Road , Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Recreation Building (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	2,671 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	5(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	60Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	2(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 886968652 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/16/2010	08/15/2010	75.00
06/16/2010	07/15/2010	150.00
05/16/2010	06/15/2010	103.00
04/16/2010	05/15/2010	24.00
03/16/2010	04/15/2010	78.00
02/16/2010	03/15/2010	46.00
01/16/2010	02/15/2010	60.00
12/16/2009	01/15/2010	157.00
11/16/2009	12/15/2009	46.00
10/16/2009	11/15/2009	27.00
09/16/2009	10/15/2009	15.00
886968652 Consumption (kWh (thousand Watt-hours))		781.00
886968652 Consumption (kBtu (thousand Btu))		2,664.77
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		2,664.77
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Recreation Building
3 Page Park Road
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

General Information

Bristol, CT - Recreation Building	
Gross Floor Area Excluding Parking: (ft ²)	2,671
Year Built	1955
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Recreation Building	
Space Type	Other - Recreation
Gross Floor Area(ft ²)	2,671
Number of PCs ^o	5
Weekly operating hours ^o	60
Workers on Main Shift ^o	2

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	1	1	0	N/A	65
Source (kBtu/ft ²)	4	4	0	N/A	136
Energy Cost					
\$/year	\$ 564.20	\$ 564.20	N/A	N/A	\$ 33,644.95
\$/ft ² /year	\$ 0.21	\$ 0.21	N/A	N/A	\$ 12.52
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Recreation. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Recreation. This building uses X% less energy per square foot than the CBECS national average for Recreation.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Fire Headquarters

Building ID: 2478786

For 12-month Period Ending: March 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: October 14, 2010

Facility

Bristol, CT - Fire Headquarters
181 North Main Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1963

Gross Floor Area (ft²): 17,880Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	374,191
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	374,191

Energy Intensity⁵

Site (kBtu/ft ² /yr)	71
Source (kBtu/ft ² /yr)	121

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	113

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	78
National Average Source EUI	157
% Difference from National Average Source EUI	-23%
Building Type	Fire Station/Police Station

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

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Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Fire Headquarters	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Fire Station/Police Station	Is this an accurate description of the space in question?		☐
Location	181 North Main Street, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Fire Dept HQs (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	17,880 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	6(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	168Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	20(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 890376902 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
02/18/2010	03/17/2010	7,640.00
01/18/2010	02/17/2010	7,880.00
12/18/2009	01/17/2010	9,000.00
11/18/2009	12/17/2009	8,440.00
10/18/2009	11/17/2009	8,800.00
09/18/2009	10/17/2009	8,000.00
08/18/2009	09/17/2009	9,960.00
07/18/2009	08/17/2009	11,360.00
06/18/2009	07/17/2009	11,720.00
05/18/2009	06/17/2009	9,360.00
04/18/2009	05/17/2009	8,680.00
890376902 Consumption (kWh (thousand Watt-hours))		100,840.00
890376902 Consumption (kBtu (thousand Btu))		344,066.08
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		344,066.08
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building?
Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.

☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.

☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Fire Headquarters
181 North Main Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT - Fire Headquarters	
Gross Floor Area Excluding Parking: (ft ²)	17,880
Year Built	1963
For 12-month Evaluation Period Ending Date:	March 31, 2010

Facility Space Use Summary

Fire Dept HQs	
Space Type	Other - Fire Station/Police Station
Gross Floor Area(ft ²)	17,880
Number of PCs ^o	6
Weekly operating hours ^o	168
Workers on Main Shift ^o	20

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 03/31/2010)	Baseline (Ending Date 03/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	71	71	0	N/A	78
Source (kBtu/ft ²)	121	121	0	N/A	157
Energy Cost					
\$/year	\$ 24,325.17	\$ 24,325.17	N/A	N/A	\$ 26,599.79
\$/ft ² /year	\$ 1.36	\$ 1.36	N/A	N/A	\$ 1.49
Greenhouse Gas Emissions					
MtCO ₂ e/year	113	113	0	N/A	124
kgCO ₂ e/ft ² /year	6	6	0	N/A	7

More than 50% of your building is defined as Fire Station/Police Station. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Fire Station/Police Station. This building uses X% less energy per square foot than the CBECS national average for Fire Station/Police Station.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Engine 5 Fire Station

Building ID: 2478802

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: October 14, 2010

Facility

Bristol, CT - Engine 5 Fire Station
285 Mix Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1964**Gross Floor Area (ft²):** 3,450**Energy Performance Rating²** (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	99,093
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	99,093

Energy Intensity⁵

Site (kBtu/ft ² /yr)	111
Source (kBtu/ft ² /yr)	179

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	33

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	78
National Average Source EUI	157
% Difference from National Average Source EUI	14%
Building Type	Fire Station/Police Station

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Engine 5 Fire Station	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Fire Station/Police Station	Is this an accurate description of the space in question?		☐
Location	285 Mix Street, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Engine Co. 5 (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	3,450 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	5(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	168Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	4(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 891246982 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/12/2010	08/11/2010	2,745.00
06/12/2010	07/11/2010	2,814.00
05/12/2010	06/11/2010	2,200.00
04/12/2010	05/11/2010	1,979.00
03/12/2010	04/11/2010	2,320.00
02/12/2010	03/11/2010	2,642.00
01/12/2010	02/11/2010	2,475.00
12/12/2009	01/11/2010	3,128.00
11/12/2009	12/11/2009	2,825.00
10/12/2009	11/11/2009	1,763.00
09/12/2009	10/11/2009	1,614.00
891246982 Consumption (kWh (thousand Watt-hours))		26,505.00
891246982 Consumption (kBtu (thousand Btu))		90,435.06
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		90,435.06
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Engine 5 Fire Station
285 Mix Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT - Engine 5 Fire Station	
Gross Floor Area Excluding Parking: (ft ²)	3,450
Year Built	1964
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Engine Co. 5	
Space Type	Other - Fire Station/Police Station
Gross Floor Area(ft ²)	3,450
Number of PCs ^o	5
Weekly operating hours ^o	168
Workers on Main Shift ^o	4

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	111	111	0	N/A	78
Source (kBtu/ft ²)	179	179	0	N/A	157
Energy Cost					
\$/year	\$ 5,859.67	\$ 5,859.67	N/A	N/A	\$ 4,117.24
\$/ft ² /year	\$ 1.70	\$ 1.70	N/A	N/A	\$ 1.19
Greenhouse Gas Emissions					
MtCO ₂ e/year	33	33	0	N/A	23
kgCO ₂ e/ft ² /year	10	10	0	N/A	7

More than 50% of your building is defined as Fire Station/Police Station. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Fire Station/Police Station. This building uses X% less energy per square foot than the CBECS national average for Fire Station/Police Station.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Engine 2 Fire Station

Building ID: 2478788

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: October 14, 2010

Facility

Bristol, CT - Engine 2 Fire Station
151 Hill Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1968

Gross Floor Area (ft²): 3,826Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - (kBtu)	0
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	0

Energy Intensity⁵

Site (kBtu/ft ² /yr)	115
Source (kBtu/ft ² /yr)	120

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	33

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	78
National Average Source EUI	157
% Difference from National Average Source EUI	-23%
Building Type	Fire Station/Police Station

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Engine 2 Fire Station	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Fire Station/Police Station	Is this an accurate description of the space in question?		☐
Location	151 Hill Street, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Fire Station (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	3,826 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	2(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	168Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	4(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building?
Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.

☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.

☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Engine 2 Fire Station
151 Hill Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT - Engine 2 Fire Station	
Gross Floor Area Excluding Parking: (ft ²)	3,826
Year Built	1968
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Fire Station	
Space Type	Other - Fire Station/Police Station
Gross Floor Area(ft ²)	3,826
Number of PCs ^o	2
Weekly operating hours ^o	168
Workers on Main Shift ^o	4

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2009)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	115	36	0	N/A	78
Source (kBtu/ft ²)	120	119	0	N/A	157
Energy Cost					
\$/year	\$ 5,214.06	\$ 2,974.17	N/A	N/A	\$ 3,537.72
\$/ft ² /year	\$ 1.36	\$ 0.78	N/A	N/A	\$ 0.92
Greenhouse Gas Emissions					
MtCO ₂ e/year	33	17	0	N/A	22
kgCO ₂ e/ft ² /year	9	4	0	N/A	6

More than 50% of your building is defined as Fire Station/Police Station. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Fire Station/Police Station. This building uses X% less energy per square foot than the CBECS national average for Fire Station/Police Station.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Engine 4 Fire Station

Building ID: 2478801

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: October 14, 2010

Facility

Bristol, CT - Engine 4 Fire Station
17 Vincent P. Kelly Road
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1963

Gross Floor Area (ft²): 3,572Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	104,867
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	104,867

Energy Intensity⁵

Site (kBtu/ft ² /yr)	136
Source (kBtu/ft ² /yr)	206

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	41

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	78
National Average Source EUI	157
% Difference from National Average Source EUI	31%
Building Type	Fire Station/Police Station

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Engine 4 Fire Station	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Fire Station/Police Station	Is this an accurate description of the space in question?		☐
Location	17 Vincent P. Kelly Road, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Engine Co. 4 (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	3,572 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	4(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	168Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	4(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 009242006 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/15/2010	08/14/2010	3,625.00
06/15/2010	07/14/2010	3,348.00
05/15/2010	06/14/2010	2,402.00
04/15/2010	05/14/2010	2,029.00
03/15/2010	04/14/2010	2,133.00
02/15/2010	03/14/2010	2,476.00
01/15/2010	02/14/2010	2,191.00
12/15/2009	01/14/2010	2,834.00
11/15/2009	12/14/2009	2,470.00
10/15/2009	11/14/2009	2,005.00
09/15/2009	10/14/2009	2,035.00
009242006 Consumption (kWh (thousand Watt-hours))		27,548.00
009242006 Consumption (kBtu (thousand Btu))		93,993.78
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		93,993.78
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Engine 4 Fire Station
17 Vincent P. Kelly Road
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT - Engine 4 Fire Station	
Gross Floor Area Excluding Parking: (ft ²)	3,572
Year Built	1963
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Engine Co. 4	
Space Type	Other - Fire Station/Police Station
Gross Floor Area(ft ²)	3,572
Number of PCs ^o	4
Weekly operating hours ^o	168
Workers on Main Shift ^o	4

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	136	136	0	N/A	78
Source (kBtu/ft ²)	206	206	0	N/A	157
Energy Cost					
\$/year	\$ 6,906.06	\$ 6,906.06	N/A	N/A	\$ 3,959.08
\$/ft ² /year	\$ 1.93	\$ 1.93	N/A	N/A	\$ 1.11
Greenhouse Gas Emissions					
MtCO ₂ e/year	41	41	0	N/A	24
kgCO ₂ e/ft ² /year	11	11	0	N/A	6

More than 50% of your building is defined as Fire Station/Police Station. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Fire Station/Police Station. This building uses X% less energy per square foot than the CBECS national average for Fire Station/Police Station.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Senior/Community Center

Building ID: 2478805

For 12-month Period Ending: June 30, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: October 15, 2010

Facility

Bristol, CT - Senior/Community Center
240 Stafford Avenue
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1956

Gross Floor Area (ft²): 53,464Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	1,059,233
Natural Gas (kBtu) ⁴	2,023,190
Total Energy (kBtu)	3,082,423

Energy Intensity⁵

Site (kBtu/ft ² /yr)	58
Source (kBtu/ft ² /yr)	106

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	239

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	65
National Average Source EUI	136
% Difference from National Average Source EUI	-22%
Building Type	Recreation

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Senior/Community Center	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Recreation	Is this an accurate description of the space in question?		☐
Location	240 Stafford Avenue, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Senior Center (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	53,464 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	10(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	56Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	10(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 889915822 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
05/14/2010	06/13/2010	31,360.00
04/14/2010	05/13/2010	25,760.00
03/14/2010	04/13/2010	20,960.00
02/14/2010	03/13/2010	24,480.00
01/14/2010	02/13/2010	25,920.00
12/14/2009	01/13/2010	24,480.00
11/14/2009	12/13/2009	28,960.00
10/14/2009	11/13/2009	25,760.00
09/14/2009	10/13/2009	22,880.00
08/14/2009	09/13/2009	20,160.00
07/14/2009	08/13/2009	30,080.00
889915822 Consumption (kWh (thousand Watt-hours))		280,800.00
889915822 Consumption (kBtu (thousand Btu))		958,089.60
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		958,089.60
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Natural Gas		
Meter: Gas Service (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
05/31/2010	06/30/2010	152.00
05/01/2010	05/30/2010	174.00
03/31/2010	04/30/2010	349.00
03/01/2010	03/30/2010	1,842.00
01/31/2010	02/28/2010	4,035.00
12/31/2009	01/30/2010	5,117.00
12/01/2009	12/30/2009	4,376.00
10/31/2009	11/30/2009	1,286.00
10/01/2009	10/30/2009	921.00
08/31/2009	09/30/2009	165.00
07/31/2009	08/30/2009	152.00

Gas Service Consumption (therms)	18,569.00
Gas Service Consumption (kBtu (thousand Btu))	1,856,900.00
Total Natural Gas Consumption (kBtu (thousand Btu))	1,856,900.00
Is this the total Natural Gas consumption at this building including all Natural Gas meters?	☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Senior/Community Center
240 Stafford Avenue
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT - Senior/Community Center	
Gross Floor Area Excluding Parking: (ft ²)	53,464
Year Built	1956
For 12-month Evaluation Period Ending Date:	June 30, 2010

Facility Space Use Summary

Senior Center	
Space Type	Other - Recreation
Gross Floor Area(ft ²)	53,464
Number of PCs ^o	10
Weekly operating hours ^o	56
Workers on Main Shift ^o	10

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 06/30/2010)	Baseline (Ending Date 06/30/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	58	58	0	N/A	65
Source (kBtu/ft ²)	106	106	0	N/A	136
Energy Cost					
\$/year	\$ 58,882.88	\$ 58,882.88	N/A	N/A	\$ 66,390.06
\$/ft ² /year	\$ 1.10	\$ 1.10	N/A	N/A	\$ 1.24
Greenhouse Gas Emissions					
MtCO ₂ e/year	239	239	0	N/A	269
kgCO ₂ e/ft ² /year	4	4	0	N/A	5

More than 50% of your building is defined as Recreation. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Recreation. This building uses X% less energy per square foot than the CBECS national average for Recreation.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Main Public Library Building

Building ID: 2478807

For 12-month Period Ending: November 30, 2009¹

Date SEP becomes ineligible: N/A

Date SEP Generated: October 18, 2010

Facility

Bristol, CT - Main Public Library Building
5 High Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1907

Gross Floor Area (ft²): 40,000Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	2,069,077
Natural Gas (kBtu) ⁴	1,326,203
Total Energy (kBtu)	3,395,280

Energy Intensity⁵

Site (kBtu/ft ² /yr)	85
Source (kBtu/ft ² /yr)	207

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	328

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	246
% Difference from National Average Source EUI	-16%
Building Type	Library

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Main Public Library Building	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Library	Is this an accurate description of the space in question?		☐
Location	5 High Street, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Main Library (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	40,000 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	30(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	64Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	10(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 891799122 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
10/17/2009	11/16/2009	36,864.00
09/17/2009	10/16/2009	51,072.00
08/17/2009	09/16/2009	62,208.00
07/17/2009	08/16/2009	65,280.00
06/17/2009	07/16/2009	62,976.00
05/17/2009	06/16/2009	59,904.00
04/17/2009	05/16/2009	48,000.00
03/17/2009	04/16/2009	47,616.00
02/19/2009	03/17/2009	53,376.00
01/20/2009	02/18/2009	28,742.00
12/31/2008	01/19/2009	21,178.00
891799122 Consumption (kWh (thousand Watt-hours))		537,216.00
891799122 Consumption (kBtu (thousand Btu))		1,832,980.99
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		1,832,980.99
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Natural Gas		
Meter: Gas Service (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
10/31/2009	11/30/2009	2,757.00
10/01/2009	10/30/2009	1,318.00
08/31/2009	09/30/2009	784.00
07/31/2009	08/30/2009	0.00
07/01/2009	07/30/2009	0.00
05/31/2009	06/30/2009	0.00
05/01/2009	05/30/2009	0.00
03/31/2009	04/30/2009	0.00
03/01/2009	03/30/2009	1,093.00
01/31/2009	02/28/2009	2,648.00
12/31/2008	01/30/2009	3,572.00

Gas Service Consumption (therms)	12,172.00
Gas Service Consumption (kBtu (thousand Btu))	1,217,200.00
Total Natural Gas Consumption (kBtu (thousand Btu))	1,217,200.00
Is this the total Natural Gas consumption at this building including all Natural Gas meters?	☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Main Public Library Building
5 High Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT - Main Public Library Building	
Gross Floor Area Excluding Parking: (ft ²)	40,000
Year Built	1907
For 12-month Evaluation Period Ending Date:	November 30, 2009

Facility Space Use Summary

Main Library	
Space Type	Other - Library
Gross Floor Area(ft ²)	40,000
Number of PCs ^o	30
Weekly operating hours ^o	64
Workers on Main Shift ^o	10

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 11/30/2009)	Baseline (Ending Date 11/30/2009)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	85	85	0	N/A	104
Source (kBtu/ft ²)	207	207	0	N/A	246
Energy Cost					
\$/year	\$ 60,524.63	\$ 60,524.63	N/A	N/A	\$ 74,158.36
\$/ft ² /year	\$ 1.51	\$ 1.51	N/A	N/A	\$ 1.85
Greenhouse Gas Emissions					
MtCO ₂ e/year	328	328	0	N/A	402
kgCO ₂ e/ft ² /year	8	8	0	N/A	10

More than 50% of your building is defined as Library. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Library. This building uses X% less energy per square foot than the CBECS national average for Library.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT- Manross Public Library

Building ID: 2478809
For 12-month Period Ending: July 31, 2010¹
Date SEP becomes ineligible: N/A

Date SEP Generated: October 18, 2010

Facility

Bristol, CT- Manross Public Library
 260 Central Street
 Bristol, CT 06010

Facility Owner

City of Bristol CT
 111 North Main Street
 Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
 111 North Main Street
 Bristol, CT 06010

Year Built: 1976

Gross Floor Area (ft²): 12,846

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	454,486
Natural Gas (kBtu) ⁴	1,035,728
Total Energy (kBtu)	1,490,214

Energy Intensity⁵

Site (kBtu/ft ² /yr)	116
Source (kBtu/ft ² /yr)	203

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	112

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	246
% Difference from National Average Source EUI	-18%
Building Type	Library

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
 15 British American Blvd
 Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT- Manross Public Library	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Library	Is this an accurate description of the space in question?		☐
Location	260 Central Street, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Public Library (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	12,846 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	10(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	64Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	10(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 890390732 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
06/14/2010	07/13/2010	15,000.00
05/14/2010	06/13/2010	12,600.00
04/14/2010	05/13/2010	8,400.00
03/14/2010	04/13/2010	8,760.00
02/14/2010	03/13/2010	12,120.00
01/14/2010	02/13/2010	11,280.00
12/14/2009	01/13/2010	13,680.00
11/14/2009	12/13/2009	10,320.00
10/14/2009	11/13/2009	8,640.00
09/14/2009	10/13/2009	7,440.00
08/14/2009	09/13/2009	11,160.00
890390732 Consumption (kWh (thousand Watt-hours))		119,400.00
890390732 Consumption (kBtu (thousand Btu))		407,392.80
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		407,392.80
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Natural Gas		
Meter: Gas Service (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
07/01/2010	07/30/2010	0.00
05/31/2010	06/30/2010	0.00
05/01/2010	05/30/2010	116.00
03/31/2010	04/30/2010	455.00
03/01/2010	03/30/2010	1,170.00
01/31/2010	02/28/2010	1,825.00
12/31/2009	01/30/2010	2,147.00
12/01/2009	12/30/2009	2,166.00
10/31/2009	11/30/2009	1,042.00
10/01/2009	10/30/2009	585.00
08/31/2009	09/30/2009	0.00

Gas Service Consumption (therms)	9,506.00
Gas Service Consumption (kBtu (thousand Btu))	950,600.00
Total Natural Gas Consumption (kBtu (thousand Btu))	950,600.00
Is this the total Natural Gas consumption at this building including all Natural Gas meters?	☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT- Manross Public Library
260 Central Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT- Manross Public Library	
Gross Floor Area Excluding Parking: (ft ²)	12,846
Year Built	1976
For 12-month Evaluation Period Ending Date:	July 31, 2010

Facility Space Use Summary

Public Library	
Space Type	Other - Library
Gross Floor Area(ft ²)	12,846
Number of PCs ^o	10
Weekly operating hours ^o	64
Workers on Main Shift ^o	10

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 07/31/2010)	Baseline (Ending Date 07/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	116	116	0	N/A	104
Source (kBtu/ft ²)	203	203	0	N/A	246
Energy Cost					
\$/year	\$ 26,905.89	\$ 26,905.89	N/A	N/A	\$ 24,120.44
\$/ft ² /year	\$ 2.09	\$ 2.09	N/A	N/A	\$ 1.87
Greenhouse Gas Emissions					
MtCO ₂ e/year	112	112	0	N/A	100
kgCO ₂ e/ft ² /year	9	9	0	N/A	8

More than 50% of your building is defined as Library. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Library. This building uses X% less energy per square foot than the CBECS national average for Library.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Youth Services

Building ID: 2478812
For 12-month Period Ending: July 31, 2010¹
Date SEP becomes ineligible: N/A

Date SEP Generated: October 18, 2010

Facility
 Bristol, CT - Youth Services
 51 High Street
 Bristol, CT 06010

Facility Owner
 City of Bristol CT
 111 North Main Street
 Bristol, CT 06010

Primary Contact for this Facility
 Roger Rousseau
 111 North Main Street
 Bristol, CT 06010

Year Built: 1900
Gross Floor Area (ft²): 6,828

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	146,922
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	146,922

Energy Intensity⁵

Site (kBtu/ft ² /yr)	71
Source (kBtu/ft ² /yr)	122

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	43

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	65
National Average Source EUI	136
% Difference from National Average Source EUI	-10%
Building Type	Recreation

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
 15 British American Blvd
 Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Youth Services	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Recreation	Is this an accurate description of the space in question?		☐
Location	51 High Street, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Youth Center (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	6,828 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	10(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	64Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	5(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 890802462 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
06/19/2010	07/18/2010	4,458.00
05/19/2010	06/18/2010	3,687.00
04/19/2010	05/18/2010	3,303.00
03/19/2010	04/18/2010	3,705.00
02/19/2010	03/18/2010	3,368.00
01/19/2010	02/18/2010	3,218.00
12/19/2009	01/18/2010	3,693.00
11/19/2009	12/18/2009	3,183.00
10/19/2009	11/18/2009	3,016.00
09/19/2009	10/18/2009	3,266.00
08/19/2009	09/18/2009	4,300.00
890802462 Consumption (kWh (thousand Watt-hours))		39,197.00
890802462 Consumption (kBtu (thousand Btu))		133,740.16
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		133,740.16
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building?
Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.

☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.

☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Youth Services
51 High Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT - Youth Services	
Gross Floor Area Excluding Parking: (ft²)	6,828
Year Built	1900
For 12-month Evaluation Period Ending Date:	July 31, 2010

Facility Space Use Summary

Youth Center	
Space Type	Other - Recreation
Gross Floor Area(ft²)	6,828
Number of PCs°	10
Weekly operating hours°	64
Workers on Main Shift°	5

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 07/31/2010)	Baseline (Ending Date 07/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft²)	71	71	0	N/A	65
Source (kBtu/ft²)	122	122	0	N/A	136
Energy Cost					
\$/year	\$ 12,575.95	\$ 12,575.95	N/A	N/A	\$ 11,479.24
\$/ft²/year	\$ 1.84	\$ 1.84	N/A	N/A	\$ 1.68
Greenhouse Gas Emissions					
MtCO ₂ e/year	43	43	0	N/A	39
kgCO ₂ e/ft²/year	6	6	0	N/A	5

More than 50% of your building is defined as Recreation. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Recreation. This building uses X% less energy per square foot than the CBECS national average for Recreation.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Dog Pound

Building ID: 2478814
 For 12-month Period Ending: July 31, 2010
 Date SEP becomes ineligible: N/A

Date SEP Generated: November 05, 2010

Facility

Bristol, CT - Dog Pound
 126 Vincent P. Kelly Road
 Bristol, CT 06010

Facility Owner

City of Bristol CT
 111 North Main Street
 Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
 111 North Main Street
 Bristol, CT 06010

Year Built: 1978

Gross Floor Area (ft²): 1,800

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Natural Gas (kBtu) ⁴	164,268
Electricity - (kBtu)	0
Total Energy (kBtu)	164,268

Energy Intensity⁵

Site (kBtu/ft ² /yr)	91
Source (kBtu/ft ² /yr)	96

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	9

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	-55%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
 15 British American Blvd
 Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Dog Pound	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	126 Vincent P. Kelly Road, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Animal Control (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	1,800 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	40Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	5(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Natural Gas		
Meter: Gas Service (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
06/17/2010	07/16/2010	25.00
05/17/2010	06/16/2010	33.00
04/17/2010	05/16/2010	84.00
03/17/2010	04/16/2010	144.00
02/17/2010	03/16/2010	283.00
01/17/2010	02/16/2010	334.00
12/17/2009	01/16/2010	410.00
11/17/2009	12/16/2009	162.00
10/17/2009	11/16/2009	71.00
09/17/2009	10/16/2009	37.00
08/17/2009	09/16/2009	31.00
Gas Service Consumption (therms)		1,614.00
Gas Service Consumption (kBtu (thousand Btu))		161,400.00
Total Natural Gas Consumption (kBtu (thousand Btu))		161,400.00
Is this the total Natural Gas consumption at this building including all Natural Gas meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Dog Pound
126 Vincent P. Kelly Road
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT - Dog Pound	
Gross Floor Area Excluding Parking: (ft ²)	1,800
Year Built	1978
For 12-month Evaluation Period Ending Date:	July 31, 2010

Facility Space Use Summary

Animal Control	
Space Type	Other - Other
Gross Floor Area(ft ²)	1,800
Number of PCs ^o	0
Weekly operating hours ^o	40
Workers on Main Shift ^o	5

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 07/31/2010)	Baseline (Ending Date 07/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	91	91	0	N/A	104
Source (kBtu/ft ²)	96	96	0	N/A	213
Energy Cost					
\$/year	\$ 3,662.69	\$ 3,662.69	N/A	N/A	\$ 4,174.01
\$/ft ² /year	\$ 2.03	\$ 2.03	N/A	N/A	\$ 2.31
Greenhouse Gas Emissions					
MtCO ₂ e/year	9	9	0	N/A	10
kgCO ₂ e/ft ² /year	5	5	0	N/A	6

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Hill Street Building

Building ID: 2483714

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: November 01, 2010

Facility

Bristol, CT - Hill Street Building
165 Hill Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1920

Gross Floor Area (ft²): 2,466Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	1,768
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	1,768

Energy Intensity⁵

Site (kBtu/ft ² /yr)	1
Source (kBtu/ft ² /yr)	2

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	0

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	25
National Average Source EUI	56
% Difference from National Average Source EUI	-96%
Building Type	Storage/Shipping/Non-Refrigerated Warehouse

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Hill Street Building	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Storage/Shipping/Non-Refrigerated Warehouse	Is this an accurate description of the space in question?		☐
Location	165 Hill Street , Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Hill St Storage (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	2,466 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 890811832 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/18/2010	08/17/2010	38.00
06/18/2010	07/17/2010	45.00
05/18/2010	06/17/2010	39.00
04/18/2010	05/17/2010	36.00
03/18/2010	04/17/2010	44.00
02/18/2010	03/17/2010	37.00
01/18/2010	02/17/2010	38.00
12/18/2009	01/17/2010	44.00
11/18/2009	12/17/2009	39.00
10/18/2009	11/17/2009	54.00
09/18/2009	10/17/2009	63.00
890811832 Consumption (kWh (thousand Watt-hours))		477.00
890811832 Consumption (kBtu (thousand Btu))		1,627.52
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		1,627.52
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Hill Street Building
165 Hill Street
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT - Hill Street Building	
Gross Floor Area Excluding Parking: (ft ²)	2,466
Year Built	1920
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Hill St Storage	
Space Type	Other - Storage/Shipping/Non-Refrigerated Warehouse
Gross Floor Area(ft ²)	2,466
Number of PCs ^a	0
Weekly operating hours ^a	0
Workers on Main Shift ^a	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	1	1	0	N/A	25
Source (kBtu/ft ²)	2	2	0	N/A	56
Energy Cost					
\$/year	\$ 576.47	\$ 576.47	N/A	N/A	\$ 20,016.32
\$/ft ² /year	\$ 0.23	\$ 0.23	N/A	N/A	\$ 7.99
Greenhouse Gas Emissions					
MtCO ₂ e/year	0	0	0	N/A	0
kgCO ₂ e/ft ² /year	0	0	0	N/A	0

More than 50% of your building is defined as Storage/Shipping/Non-Refrigerated Warehouse. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Storage/Shipping/Non-Refrigerated Warehouse. This building uses X% less energy per square foot than the CBECS national average for Storage/Shipping/Non-Refrigerated Warehouse.

Notes:

- o - This attribute is optional.
- d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - City Yard Complex

Building ID: 2483708
 For 12-month Period Ending: July 31, 2010¹
 Date SEP becomes ineligible: N/A

Date SEP Generated: November 05, 2010

Facility

Bristol, CT - City Yard Complex
 95 Vincent P. Kelly Rd.
 Bristol, CT 06010

Facility Owner

City of Bristol CT
 111 North Main Street
 Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
 111 North Main Street
 Bristol, CT 06010

Year Built: 1970

Gross Floor Area (ft²): 22,740

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	85,576
Natural Gas (kBtu) ⁴	1,602,949
Total Energy (kBtu)	1,688,525

Energy Intensity⁵

Site (kBtu/ft ² /yr)	74
Source (kBtu/ft ² /yr)	86

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	96

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	25
National Average Source EUI	56
% Difference from National Average Source EUI	54%
Building Type	Storage/Shipping/Non-Refrigerated Warehouse

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
 15 British American Blvd
 Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - City Yard Complex	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Storage/Shipping/Non-Refrigerated Warehouse	Is this an accurate description of the space in question?		☐
Location	95 Vincent P. Kelly Rd., Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
City Yard (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	22,740 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	40Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	3(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 891540112 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
06/14/2010	07/13/2010	900.00
05/14/2010	06/13/2010	1,052.00
04/14/2010	05/13/2010	1,181.00
03/14/2010	04/13/2010	1,402.00
02/14/2010	03/13/2010	3,705.00
01/14/2010	02/13/2010	3,278.00
12/14/2009	01/13/2010	5,778.00
11/14/2009	12/13/2009	2,501.00
10/14/2009	11/13/2009	1,565.00
09/14/2009	10/13/2009	1,281.00
08/14/2009	09/13/2009	992.00
891540112 Consumption (kWh (thousand Watt-hours))		23,635.00
891540112 Consumption (kBtu (thousand Btu))		80,642.62
Meter: 890126452 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
06/16/2010	07/15/2010	0.00
05/16/2010	06/15/2010	0.00
04/16/2010	05/15/2010	0.00
03/16/2010	04/15/2010	0.00
02/16/2010	03/15/2010	2.00
01/16/2010	02/15/2010	5.00
12/16/2009	01/15/2010	10.00
11/16/2009	12/15/2009	7.00
10/16/2009	11/15/2009	0.00
09/16/2009	10/15/2009	0.00
08/16/2009	09/15/2009	0.00
890126452 Consumption (kWh (thousand Watt-hours))		24.00
890126452 Consumption (kBtu (thousand Btu))		81.89

Meter: 882345722 (kWh (thousand Watt-hours))**Space(s):** Entire Facility**Generation Method:** Grid Purchase

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
06/16/2010	07/15/2010	0.00
05/16/2010	06/15/2010	0.00
04/16/2010	05/15/2010	0.00
03/16/2010	04/15/2010	1.00
02/16/2010	03/15/2010	1.00
01/16/2010	02/15/2010	1.00
12/16/2009	01/15/2010	0.00
11/16/2009	12/15/2009	0.00
10/16/2009	11/15/2009	0.00
09/16/2009	10/15/2009	0.00
08/16/2009	09/15/2009	0.00
882345722 Consumption (kWh (thousand Watt-hours))		3.00
882345722 Consumption (kBtu (thousand Btu))		10.24
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		80,734.74
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas**Meter: Gas Service (therms)****Space(s):** Entire Facility

Start Date	End Date	Energy Use (therms)
07/01/2010	07/30/2010	0.00
05/31/2010	06/30/2010	0.00
05/01/2010	05/30/2010	79.00
03/31/2010	04/30/2010	165.00
03/01/2010	03/30/2010	1,732.00
01/31/2010	02/28/2010	3,747.00
12/31/2009	01/30/2010	4,125.00
12/01/2009	12/30/2009	3,439.00
10/31/2009	11/30/2009	889.00
10/01/2009	10/30/2009	520.00
08/31/2009	09/30/2009	16.00
Gas Service Consumption (therms)		14,712.00
Gas Service Consumption (kBtu (thousand Btu))		1,471,200.00
Total Natural Gas Consumption (kBtu (thousand Btu))		1,471,200.00
Is this the total Natural Gas consumption at this building including all Natural Gas meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building?
Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.

☐**On-Site Solar and Wind Energy**

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.



Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - City Yard Complex
95 Vincent P. Kelly Rd.
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Bristol, CT - City Yard Complex	
Gross Floor Area Excluding Parking: (ft ²)	22,740
Year Built	1970
For 12-month Evaluation Period Ending Date:	July 31, 2010

Facility Space Use Summary

City Yard	
Space Type	Other - Storage/Shipping/Non-Refrigerated Warehouse
Gross Floor Area(ft ²)	22,740
Number of PCs ^a	0
Weekly operating hours ^a	40
Workers on Main Shift ^a	3

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 07/31/2010)	Baseline (Ending Date 07/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	74	74	0	N/A	25
Source (kBtu/ft ²)	86	86	0	N/A	56
Energy Cost					
\$/year	\$ 31,231.02	\$ 31,231.02	N/A	N/A	\$ 10,515.49
\$/ft ² /year	\$ 1.37	\$ 1.37	N/A	N/A	\$ 0.46
Greenhouse Gas Emissions					
MtCO ₂ e/year	96	96	0	N/A	32
kgCO ₂ e/ft ² /year	4	4	0	N/A	1

More than 50% of your building is defined as Storage/Shipping/Non-Refrigerated Warehouse. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Storage/Shipping/Non-Refrigerated Warehouse. This building uses X% less energy per square foot than the CBECS national average for Storage/Shipping/Non-Refrigerated Warehouse.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Transfer Station Quonset Hut

Building ID: 2483725

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility

Bristol, CT - Transfer Station Quonset Hut
685 Lake Avenue
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

Year Built: 2004**Gross Floor Area (ft²):** 2,250**Energy Performance Rating² (1-100)** N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	10,308
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	10,308

Energy Intensity⁵

Site (kBtu/ft ² /yr)	5
Source (kBtu/ft ² /yr)	15

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	-93%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Transfer Station Quonset Hut	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	685 Lake Avenue, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Transfer Station Hut (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	2,250 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	2(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	40Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	5(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 890534802 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/15/2010	08/14/2010	93.00
06/15/2010	07/14/2010	248.00
05/15/2010	06/14/2010	289.00
04/15/2010	05/14/2010	256.00
03/15/2010	04/14/2010	270.00
02/15/2010	03/14/2010	272.00
01/15/2010	02/14/2010	246.00
12/15/2009	01/14/2010	525.00
11/15/2009	12/14/2009	199.00
10/15/2009	11/14/2009	169.00
09/15/2009	10/14/2009	257.00
890534802 Consumption (kWh (thousand Watt-hours))		2,824.00
890534802 Consumption (kBtu (thousand Btu))		9,635.49
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		9,635.49
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Transfer Station Quonset Hut
685 Lake Avenue
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

General Information

Bristol, CT - Transfer Station Quonset Hut	
Gross Floor Area Excluding Parking: (ft ²)	2,250
Year Built	2004
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Transfer Station Hut	
Space Type	Other - Other
Gross Floor Area(ft ²)	2,250
Number of PCs ^o	2
Weekly operating hours ^o	40
Workers on Main Shift ^o	5

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	5	5	0	N/A	104
Source (kBtu/ft ²)	15	15	0	N/A	213
Energy Cost					
\$/year	\$ 934.23	\$ 934.23	N/A	N/A	\$ 21,213.96
\$/ft ² /year	\$ 0.42	\$ 0.42	N/A	N/A	\$ 9.54
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol, CT - Transfer Station Office and Scale House

Building ID: 2483720

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility

Bristol, CT - Transfer Station Office and
Scale House
685 Lake Avenue
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

Year Built: 2004**Gross Floor Area (ft²):** 435**Energy Performance Rating²** (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu) 76,442

Natural Gas - (kBtu)⁴ 0

Total Energy (kBtu) 76,442

Energy Intensity⁵Site (kBtu/ft²/yr) 176Source (kBtu/ft²/yr) 587**Emissions** (based on site energy use)Greenhouse Gas Emissions (MtCO₂e/year) N/A**Electric Distribution Utility**

N/A

National Average Comparison

National Average Site EUI 104

National Average Source EUI 213

% Difference from National Average Source EUI 176%

Building Type Other

Stamp of Certifying Professional

Based on the conditions observed at the
time of my visit to this building, I certify that
the information contained within this
statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality N/A

Acceptable Thermal Environmental Conditions N/A

Adequate Illumination N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol, CT - Transfer Station Office and Scale House	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	685 Lake Avenue, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Transfer Station (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	435 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	2(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	40Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	5(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 891775132 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/15/2010	08/14/2010	2,251.00
06/15/2010	07/14/2010	2,241.00
05/15/2010	06/14/2010	1,451.00
04/15/2010	05/14/2010	596.00
03/15/2010	04/14/2010	1,051.00
02/15/2010	03/14/2010	2,807.00
01/15/2010	02/14/2010	2,840.00
12/15/2009	01/14/2010	4,093.00
11/15/2009	12/14/2009	1,677.00
10/15/2009	11/14/2009	1,147.00
09/15/2009	10/14/2009	465.00
891775132 Consumption (kWh (thousand Watt-hours))		20,619.00
891775132 Consumption (kBtu (thousand Btu))		70,352.03
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		70,352.03
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Bristol, CT - Transfer Station Office and Scale House
685 Lake Avenue
Bristol, CT 06010

Facility Owner

N/A

Primary Contact for this Facility

N/A

General Information

Bristol, CT - Transfer Station Office and Scale House	
Gross Floor Area Excluding Parking: (ft ²)	435
Year Built	2004
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Transfer Station	
Space Type	Other - Other
Gross Floor Area(ft ²)	435
Number of PCs ^o	2
Weekly operating hours ^o	40
Workers on Main Shift ^o	5

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	176	176	0	N/A	104
Source (kBtu/ft ²)	587	587	0	N/A	213
Energy Cost					
\$/year	\$ 1,781.56	\$ 1,781.56	N/A	N/A	\$ 1,054.36
\$/ft ² /year	\$ 4.10	\$ 4.10	N/A	N/A	\$ 2.43
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Bristol CT - Water Pollution Control Plant

Building ID: 2480303

For 12-month Period Ending: July 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: November 01, 2010

Facility

Bristol CT - Water Pollution Control Plant
75 Battisto Road
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1987**Energy Performance Rating²** (1-100) 91**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	12,273,126
Natural Gas (kBtu) ⁴	3,144,321
Total Energy (kBtu)	15,417,447

Energy Intensity⁵

Site (kBtu/gpd)	2
Source (kBtu/gpd)	5

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	1,693

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	3
National Average Source EUI	9
% Difference from National Average Source EUI	-46%
Building Type	Wastewater

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Bristol CT - Water Pollution Control Plant	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Wastewater	Is this an accurate description of the space in question?		☐
Location	75 Battisto Road, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Water Utility/Wastewater Plant	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
WPCP (Municipal Wastewater Treatment Plant)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Average Influent Biological Demand (BOD5) Concentration	146 mg/l (milligrams per liter)	Is this the average biological demand concentration of the wastewater flowing into the facility? This should be the average concentration estimated over a 12 month period. BOD5 should be reported in mg/l. BOD5 is not the same as CBOD5, the carbonaceous biological oxygen demand. BOD5 is required for the energy performance rating.		☐
Average Effluent Biological Demand (BOD5) Concentration	4 mg/l (milligrams per liter)	Is this the average biological demand concentration of the wastewater after it is treated and is leaving the facility? This should be the average concentration estimated over a 12 month period. BOD5 should be reported in mg/l. BOD5 is not the same as CBOD5, the carbonaceous biological oxygen demand. BOD5 is required for the energy performance rating.		☐
Plant Design Flow Rate	11 MGD (million gallons per day)	Is this the plant design flow rate, measured in million gallons per day (MGD)? This is the amount of flow the plant is designed to process.		☐
Fixed Film Trickle Filtration Process	No	Does this facility have an onsite fixed film trickle filtration process? Trickle filtration is a process used to reduce BOD, pathogens, and nitrogen levels.		☐
Nutrient Removal	Yes	Does this facility conduct nutrient removal as part of the treatment process? Nutrient removal is considered any process included for the purpose of removing nutrients (i.e., nitrogen, phosphorous). This may include biological nitrification, biological denitrification, phosphorus removal, or recirculating sand filters.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 890434882 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
06/20/2010	07/19/2010	329,760.00
05/20/2010	06/19/2010	303,840.00
04/20/2010	05/19/2010	289,440.00
03/20/2010	04/19/2010	329,760.00
02/20/2010	03/19/2010	291,600.00
01/20/2010	02/19/2010	259,920.00
12/20/2009	01/19/2010	308,160.00
11/20/2009	12/19/2009	257,760.00
10/20/2009	11/19/2009	188,640.00
09/20/2009	10/19/2009	414,720.00
08/20/2009	09/19/2009	316,080.00
890434882 Consumption (kWh (thousand Watt-hours))		3,289,680.00
890434882 Consumption (kBtu (thousand Btu))		11,224,388.16
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		11,224,388.16
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Natural Gas		
Meter: Gas Service (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
07/01/2010	07/30/2010	92.00
05/31/2010	06/30/2010	152.00
05/01/2010	05/30/2010	293.00
03/31/2010	04/30/2010	1,139.00
03/01/2010	03/30/2010	3,530.00
01/31/2010	02/28/2010	5,229.00
12/31/2009	01/30/2010	8,180.00
12/01/2009	12/30/2009	7,018.00
10/31/2009	11/30/2009	1,972.00
10/01/2009	10/30/2009	1,052.00
08/31/2009	09/30/2009	198.00

Gas Service Consumption (therms)	28,855.00
Gas Service Consumption (kBtu (thousand Btu))	2,885,500.00
Total Natural Gas Consumption (kBtu (thousand Btu))	2,885,500.00
Is this the total Natural Gas consumption at this building including all Natural Gas meters?	☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building?
Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.

☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.

☐

Flow Type: Average Influent Flow Meter		
Meter Name: Average Influent Flow Meter		
Start Date	End Date	Average Influent Flow (MGD (million gallons per day))
07/01/2010	07/31/2010	5.80
06/01/2010	06/30/2010	6.60
05/01/2010	05/31/2010	7.60
04/01/2010	04/30/2010	12.60
03/01/2010	03/31/2010	15.10
02/01/2010	02/28/2010	9.80
01/01/2010	01/31/2010	9.70
12/01/2009	12/31/2009	10.10
11/01/2009	11/30/2009	8.30
10/01/2009	10/31/2009	8.00
09/01/2009	09/30/2009	7.00
08/01/2009	08/31/2009	8.80
Total Flow (MGD)		109.40

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP) and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

General Information:

Bristol CT - Water Pollution Control Plant	
Year Built	1987
For 12-month Evaluation Period Ending Date:	July 31, 2010

Facility Space Use Summary

WPCP	
Space Type	Municipal Wastewater Treatment Plant
Average Influent Biological Demand (BOD5) Concentration	146
Average Effluent Biological Demand (BOD5) Concentration	4
Plant Design Flow Rate	11
Fixed Film Trickle Filtration Process	No
Nutrient Removal	Yes

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date: 07/31/2010)	Baseline (Ending Date: 07/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	91	91	75	N/A	50
Energy Intensity					
Site (kBtu/gpd)	2	2	N/A	N/A	3
Source (kBtu/gpd)	5	5	N/A	N/A	9
Energy Cost					
\$/year	\$ 195,958	\$ 195,958	N/A	N/A	\$ 362,929
\$/mgpd/year	\$21,495.06	\$21,495.06	N/A	N/A	\$39,810.38
Greenhouse Gas Emissions					
MtCO ₂ e/year	1,693	1,693	N/A	N/A	3,136
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

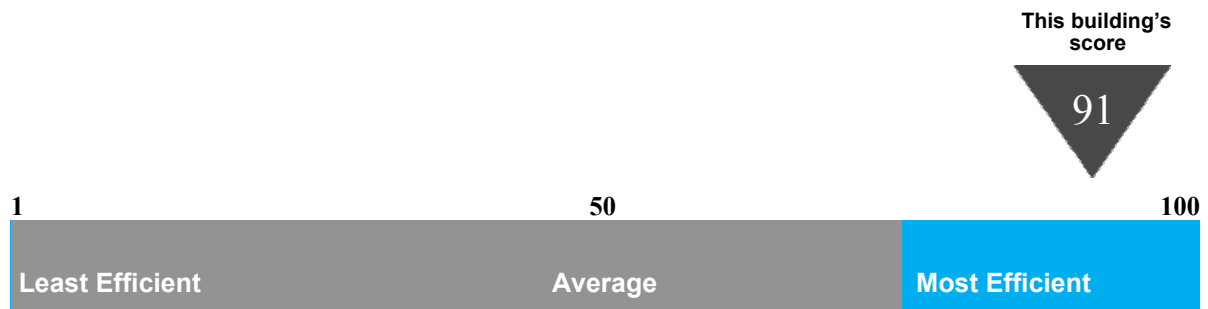
Statement of Energy Performance

2010

Bristol CT - Water Pollution Control Plant
75 Battisto Road
Bristol, CT 06010

Portfolio Manager Building ID: 2480303

The energy use of this building has been measured and compared to other similar buildings using the Environmental Protection Agency's (EPA's) Energy Performance Scale of 1–100, with 1 being the least energy efficient and 100 the most energy efficient. For more information, visit energystar.gov/benchmark.



This building uses N/A kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending July 2010

Buildings with a score of 75 or higher may qualify for EPA's ENERGY STAR.

I certify that the information contained within this statement is accurate and in accordance with U.S. Environmental Protection Agency's measurement standards, found at energystar.gov

Date of certification





STATEMENT OF ENERGY PERFORMANCE

WPC - Broad St PS

Building ID: 2495005

For 12-month Period Ending: August 31, 2010

Date SEP becomes ineligible: N/A

Date SEP Generated: November 04, 2010

Facility

WPC - Broad St PS
Broad St
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1990

Gross Floor Area (ft²): 3,200Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	3,833,521
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	3,833,521

Energy Intensity⁵

Site (kBtu/ft ² /yr)	1198
Source (kBtu/ft ² /yr)	4001

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	476

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	1779%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	WPC - Broad St PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Broad St, Bristol , CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Broad St PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	3,200 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 891605802 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/21/2010	08/20/2010	52,992.00
06/21/2010	07/20/2010	55,872.00
05/21/2010	06/20/2010	60,480.00
04/21/2010	05/20/2010	82,944.00
03/21/2010	04/20/2010	201,024.00
02/21/2010	03/20/2010	139,968.00
01/21/2010	02/20/2010	103,104.00
12/21/2009	01/20/2010	119,232.00
11/21/2009	12/20/2009	78,912.00
10/21/2009	11/20/2009	54,720.00
09/21/2009	10/20/2009	93,312.00
891605802 Consumption (kWh (thousand Watt-hours))		1,042,560.00
891605802 Consumption (kBtu (thousand Btu))		3,557,214.72
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		3,557,214.72
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

WPC - Broad St PS
Broad St
Bristol , CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

WPC - Broad St PS	
Gross Floor Area Excluding Parking: (ft ²)	3,200
Year Built	1990
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Broad St PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	3,200
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	1198	1198	0	N/A	104
Source (kBtu/ft ²)	4001	4001	0	N/A	213
Energy Cost					
\$/year	\$ 67,202.27	\$ 67,202.27	N/A	N/A	\$ 5,834.02
\$/ft ² /year	\$ 21.00	\$ 21.00	N/A	N/A	\$ 1.82
Greenhouse Gas Emissions					
MtCO ₂ e/year	476	476	0	N/A	41
kgCO ₂ e/ft ² /year	149	149	0	N/A	13

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

WPC - Cherry Hill PS

Building ID: 2495009

For 12-month Period Ending: August 31, 2010

Date SEP becomes ineligible: N/A

Date SEP Generated: November 04, 2010

Facility

WPC - Cherry Hill PS
Cherry Hill
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1990

Gross Floor Area (ft²): 250Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	41,301
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	41,301

Energy Intensity⁵

Site (kBtu/ft ² /yr)	165
Source (kBtu/ft ² /yr)	552

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	5

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	159%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	WPC - Cherry Hill PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Cherry Hill , Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Cherry Hill PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	250 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 886124482 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/11/2010	08/10/2010	670.00
06/11/2010	07/10/2010	760.00
05/11/2010	06/10/2010	803.00
04/11/2010	05/10/2010	905.00
03/11/2010	04/10/2010	1,073.00
02/11/2010	03/10/2010	1,113.00
01/11/2010	02/10/2010	1,132.00
12/11/2009	01/10/2010	1,467.00
11/11/2009	12/10/2009	1,336.00
10/11/2009	11/10/2009	983.00
09/11/2009	10/10/2009	924.00
886124482 Consumption (kWh (thousand Watt-hours))		11,166.00
886124482 Consumption (kBtu (thousand Btu))		38,098.39
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		38,098.39
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

WPC - Cherry Hill PS
Cherry Hill
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

WPC - Cherry Hill PS	
Gross Floor Area Excluding Parking: (ft ²)	250
Year Built	1990
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Cherry Hill PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	250
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	165	165	0	N/A	104
Source (kBtu/ft ²)	552	552	0	N/A	213
Energy Cost					
\$/year	\$ 1,177.42	\$ 1,177.42	N/A	N/A	\$ 741.23
\$/ft ² /year	\$ 4.71	\$ 4.71	N/A	N/A	\$ 2.97
Greenhouse Gas Emissions					
MtCO ₂ e/year	5	5	0	N/A	3
kgCO ₂ e/ft ² /year	21	21	0	N/A	13

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Drayla PS

Building ID: 2495017

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility
Drayla PS
Drayla
Bristol, CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1990
Gross Floor Area (ft²): 50

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	1,588
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	1,588

Energy Intensity⁵

Site (kBtu/ft ² /yr)	32
Source (kBtu/ft ² /yr)	106

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	-50%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Drayla PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Drayla, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Drayla PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	50 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 886998202 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/10/2010	08/09/2010	31.00
06/10/2010	07/09/2010	37.00
05/10/2010	06/09/2010	37.00
04/10/2010	05/09/2010	44.00
03/10/2010	04/09/2010	55.00
02/10/2010	03/09/2010	32.00
01/10/2010	02/09/2010	51.00
12/10/2009	01/09/2010	40.00
11/10/2009	12/09/2009	38.00
10/10/2009	11/09/2009	35.00
09/10/2009	10/09/2009	32.00
886998202 Consumption (kWh (thousand Watt-hours))		432.00
886998202 Consumption (kBtu (thousand Btu))		1,473.98
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		1,473.98
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility
Drayla PS
Drayla
Bristol, CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Drayla PS	
Gross Floor Area Excluding Parking: (ft ²)	50
Year Built	1990
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Drayla PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	50
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	32	32	0	N/A	104
Source (kBtu/ft ²)	106	106	0	N/A	213
Energy Cost					
\$/year	\$ 522.54	\$ 522.54	N/A	N/A	\$ 1,711.09
\$/ft ² /year	\$ 10.45	\$ 10.45	N/A	N/A	\$ 34.22
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Cross St PS

Building ID: 2495013

For 12-month Period Ending: August 31, 2010

Date SEP becomes ineligible: N/A

Date SEP Generated: November 04, 2010

Facility

Cross St PS
Cross St
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1990

Gross Floor Area (ft²): 250Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	215,523
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	215,523

Energy Intensity⁵

Site (kBtu/ft ² /yr)	862
Source (kBtu/ft ² /yr)	2879

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	27

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	1252%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

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Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Cross St PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Cross St, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Cross St PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	250 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 890393852 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/15/2010	08/14/2010	5,952.00
06/15/2010	07/14/2010	5,856.00
05/15/2010	06/14/2010	6,144.00
04/15/2010	05/14/2010	4,800.00
03/15/2010	04/14/2010	5,568.00
02/15/2010	03/14/2010	5,088.00
01/15/2010	02/14/2010	4,416.00
12/15/2009	01/14/2010	5,472.00
11/15/2009	12/14/2009	4,608.00
10/15/2009	11/14/2009	4,416.00
09/15/2009	10/14/2009	4,896.00
890393852 Consumption (kWh (thousand Watt-hours))		57,216.00
890393852 Consumption (kBtu (thousand Btu))		195,220.99
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		195,220.99
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Cross St PS
Cross St
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Cross St PS	
Gross Floor Area Excluding Parking: (ft ²)	250
Year Built	1990
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Cross St PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	250
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	862	862	0	N/A	104
Source (kBtu/ft ²)	2879	2879	0	N/A	213
Energy Cost					
\$/year	\$ 4,535.09	\$ 4,535.09	N/A	N/A	\$ 547.10
\$/ft ² /year	\$ 18.14	\$ 18.14	N/A	N/A	\$ 2.19
Greenhouse Gas Emissions					
MtCO ₂ e/year	27	27	0	N/A	3
kgCO ₂ e/ft ² /year	107	107	0	N/A	13

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

East Main PS

Building ID: 2495021

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility
East Main PS
East Main
Bristol, CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1990
Gross Floor Area (ft²): 486

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	293,419
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	293,419

Energy Intensity⁵

Site (kBtu/ft ² /yr)	604
Source (kBtu/ft ² /yr)	2017

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	847%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

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In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	East Main PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	East Main, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
East Main PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	486 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 890169212 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/15/2010	08/14/2010	4,360.00
06/15/2010	07/14/2010	4,650.00
05/15/2010	06/14/2010	6,090.00
04/15/2010	05/14/2010	7,260.00
03/15/2010	04/14/2010	13,050.00
02/15/2010	03/14/2010	9,720.00
01/15/2010	02/14/2010	7,850.00
12/15/2009	01/14/2010	10,090.00
11/15/2009	12/14/2009	6,440.00
10/15/2009	11/14/2009	5,490.00
09/15/2009	10/14/2009	5,060.00
890169212 Consumption (kWh (thousand Watt-hours))		80,060.00
890169212 Consumption (kBtu (thousand Btu))		273,164.72
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		273,164.72
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility
East Main PS
East Main
Bristol, CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

East Main PS	
Gross Floor Area Excluding Parking: (ft ²)	486
Year Built	1990
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

East Main PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	486
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	604	604	0	N/A	104
Source (kBtu/ft ²)	2017	2017	0	N/A	213
Energy Cost					
\$/year	\$ 6,233.14	\$ 6,233.14	N/A	N/A	\$ 1,073.72
\$/ft ² /year	\$ 12.83	\$ 12.83	N/A	N/A	\$ 2.21
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Lake St PS

Building ID: 2495027

For 12-month Period Ending: September 30, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: November 04, 2010

Facility

Lake St PS
Lake St
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1990

Gross Floor Area (ft²): 250Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	137,631
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	137,631

Energy Intensity⁵

Site (kBtu/ft ² /yr)	551
Source (kBtu/ft ² /yr)	1839

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	17

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	763%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Lake St PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Lake St, Bristol , CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Lake St PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	250 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 890404892 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
08/13/2010	09/12/2010	2,208.00
07/13/2010	08/12/2010	4,608.00
06/13/2010	07/12/2010	3,576.00
05/13/2010	06/12/2010	3,240.00
04/13/2010	05/12/2010	3,744.00
03/13/2010	04/12/2010	1,248.00
02/13/2010	03/12/2010	4,416.00
01/13/2010	02/12/2010	2,976.00
12/13/2009	01/12/2010	2,304.00
11/13/2009	12/12/2009	2,208.00
10/13/2009	11/12/2009	1,744.00
890404892 Consumption (kWh (thousand Watt-hours))		32,272.00
890404892 Consumption (kBtu (thousand Btu))		110,112.06
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		110,112.06
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building?
Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.

☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.

☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Lake St PS
Lake St
Bristol , CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Lake St PS	
Gross Floor Area Excluding Parking: (ft ²)	250
Year Built	1990
For 12-month Evaluation Period Ending Date:	September 30, 2010

Facility Space Use Summary

Lake St PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	250
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 09/30/2010)	Baseline (Ending Date 09/30/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	551	551	0	N/A	104
Source (kBtu/ft ²)	1839	1839	0	N/A	213
Energy Cost					
\$/year	\$ 5,349.08	\$ 5,349.08	N/A	N/A	\$ 1,010.51
\$/ft ² /year	\$ 21.40	\$ 21.40	N/A	N/A	\$ 4.04
Greenhouse Gas Emissions					
MtCO ₂ e/year	17	17	0	N/A	3
kgCO ₂ e/ft ² /year	68	68	0	N/A	13

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Julia St PS

Building ID: 2495025

For 12-month Period Ending: September 30, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility
Julia St PS
Julia St
Bristol , CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1990
Gross Floor Area (ft²): 300

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	283,481
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	283,481

Energy Intensity⁵

Site (kBtu/ft ² /yr)	945
Source (kBtu/ft ² /yr)	3156

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	1382%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Julia St PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Julia St, Bristol , CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Julia St PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	300 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 886089042 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
08/13/2010	09/12/2010	3,520.00
07/13/2010	08/12/2010	3,840.00
06/13/2010	07/12/2010	5,120.00
05/13/2010	06/12/2010	6,720.00
04/13/2010	05/12/2010	12,640.00
03/13/2010	04/12/2010	9,760.00
02/13/2010	03/12/2010	7,680.00
01/13/2010	02/12/2010	10,560.00
12/13/2009	01/12/2010	7,040.00
11/13/2009	12/12/2009	5,920.00
10/13/2009	11/12/2009	4,960.00
886089042 Consumption (kWh (thousand Watt-hours))		77,760.00
886089042 Consumption (kBtu (thousand Btu))		265,317.12
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		265,317.12
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility
Julia St PS
Julia St
Bristol , CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Julia St PS	
Gross Floor Area Excluding Parking: (ft ²)	300
Year Built	1990
For 12-month Evaluation Period Ending Date:	September 30, 2010

Facility Space Use Summary

Julia St PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	300
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 09/30/2010)	Baseline (Ending Date 09/30/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	945	945	0	N/A	104
Source (kBtu/ft ²)	3156	3156	0	N/A	213
Energy Cost					
\$/year	\$ 5,425.42	\$ 5,425.42	N/A	N/A	\$ 597.12
\$/ft ² /year	\$ 18.08	\$ 18.08	N/A	N/A	\$ 1.99
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Ivy PS

Building ID: 2495024

For 12-month Period Ending: August 31, 2010

Date SEP becomes ineligible: N/A

Date SEP Generated: November 04, 2010

Facility

Ivy PS
Ivy St
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1990

Gross Floor Area (ft²): 250Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	47,461
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	47,461

Energy Intensity⁵

Site (kBtu/ft ² /yr)	190
Source (kBtu/ft ² /yr)	634

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	6

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	198%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Ivy PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Ivy St, Bristol , CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Ivy St PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	250 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 886126132 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/11/2010	08/10/2010	572.00
06/11/2010	07/10/2010	785.00
05/11/2010	06/10/2010	854.00
04/11/2010	05/10/2010	1,118.00
03/11/2010	04/10/2010	1,872.00
02/11/2010	03/10/2010	1,607.00
01/11/2010	02/10/2010	1,494.00
12/11/2009	01/10/2010	1,835.00
11/11/2009	12/10/2009	1,211.00
10/11/2009	11/10/2009	914.00
09/11/2009	10/10/2009	784.00
886126132 Consumption (kWh (thousand Watt-hours))		13,046.00
886126132 Consumption (kBtu (thousand Btu))		44,512.95
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		44,512.95
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Ivy PS
Ivy St
Bristol , CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

Ivy PS	
Gross Floor Area Excluding Parking: (ft ²)	250
Year Built	1990
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Ivy St PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	250
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	190	190	0	N/A	104
Source (kBtu/ft ²)	634	634	0	N/A	213
Energy Cost					
\$/year	\$ 943.27	\$ 943.27	N/A	N/A	\$ 516.72
\$/ft ² /year	\$ 3.77	\$ 3.77	N/A	N/A	\$ 2.07
Greenhouse Gas Emissions					
MtCO ₂ e/year	6	6	0	N/A	3
kgCO ₂ e/ft ² /year	24	24	0	N/A	13

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

Lufkin St PS

Building ID: 2495029

For 12-month Period Ending: September 30, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility
Lufkin St PS
Lufkin St
Bristol, CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1990
Gross Floor Area (ft²): 210

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	18,699
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	18,699

Energy Intensity⁵

Site (kBtu/ft ² /yr)	89
Source (kBtu/ft ² /yr)	297

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	40%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Lufkin St PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Lufkin St, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Lufkin St (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	210 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 890645762 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
08/07/2010	09/06/2010	282.00
07/07/2010	08/06/2010	245.00
06/07/2010	07/06/2010	289.00
05/07/2010	06/06/2010	360.00
04/07/2010	05/06/2010	441.00
03/07/2010	04/06/2010	560.00
02/07/2010	03/06/2010	580.00
01/07/2010	02/06/2010	662.00
12/07/2009	01/06/2010	688.00
11/07/2009	12/06/2009	517.00
10/07/2009	11/06/2009	487.00
890645762 Consumption (kWh (thousand Watt-hours))		5,111.00
890645762 Consumption (kBtu (thousand Btu))		17,438.73
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		17,438.73
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility
Lufkin St PS
Lufkin St
Bristol, CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Lufkin St PS	
Gross Floor Area Excluding Parking: (ft ²)	210
Year Built	1990
For 12-month Evaluation Period Ending Date:	September 30, 2010

Facility Space Use Summary

Lufkin St	
Space Type	Other - Other
Gross Floor Area(ft ²)	210
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 09/30/2010)	Baseline (Ending Date 09/30/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	89	89	0	N/A	104
Source (kBtu/ft ²)	297	297	0	N/A	213
Energy Cost					
\$/year	\$ 1,407.51	\$ 1,407.51	N/A	N/A	\$ 1,643.99
\$/ft ² /year	\$ 6.70	\$ 6.70	N/A	N/A	\$ 7.83
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

WPC - Middle St PS

Building ID: 2495033

For 12-month Period Ending: August 31, 2010

Date SEP becomes ineligible: N/A

Date SEP Generated: November 04, 2010

Facility

WPC - Middle St PS
Middle St
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

Year Built: 1990

Gross Floor Area (ft²): 250Energy Performance Rating² (1-100) N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	122,595
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	122,595

Energy Intensity⁵

Site (kBtu/ft ² /yr)	490
Source (kBtu/ft ² /yr)	1638

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	15

Electric Distribution Utility

Northeast Util - Connecticut Light & Power Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	669%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

Matthew Goss
15 British American Blvd
Latham, NY 12110

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	WPC - Middle St PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Middle St, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Middle PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	250 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Northeast Util - Connecticut Light & Power Co

Fuel Type: Electricity		
Meter: 886090412 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/15/2010	08/14/2010	2,320.00
06/15/2010	07/14/2010	2,560.00
05/15/2010	06/14/2010	2,880.00
04/15/2010	05/14/2010	2,800.00
03/15/2010	04/14/2010	3,360.00
02/15/2010	03/14/2010	3,600.00
01/15/2010	02/14/2010	3,360.00
12/15/2009	01/14/2010	4,080.00
11/15/2009	12/14/2009	3,200.00
10/15/2009	11/14/2009	2,640.00
09/15/2009	10/14/2009	2,480.00
886090412 Consumption (kWh (thousand Watt-hours))		33,280.00
886090412 Consumption (kBtu (thousand Btu))		113,551.36
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		113,551.36
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

WPC - Middle St PS
Middle St
Bristol, CT 06010

Facility Owner

City of Bristol CT
111 North Main Street
Bristol, CT 06010

Primary Contact for this Facility

Roger Rousseau
111 North Main Street
Bristol, CT 06010

General Information

WPC - Middle St PS	
Gross Floor Area Excluding Parking: (ft ²)	250
Year Built	1990
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Middle PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	250
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	490	490	0	N/A	104
Source (kBtu/ft ²)	1638	1638	0	N/A	213
Energy Cost					
\$/year	\$ 2,979.64	\$ 2,979.64	N/A	N/A	\$ 631.92
\$/ft ² /year	\$ 11.92	\$ 11.92	N/A	N/A	\$ 2.53
Greenhouse Gas Emissions					
MtCO ₂ e/year	15	15	0	N/A	3
kgCO ₂ e/ft ² /year	61	61	0	N/A	13

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

WPC - Matthews St PS

Building ID: 2495032

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility
WPC - Matthews St PS
Matthews St
Bristol, CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1990
Gross Floor Area (ft²): 330

Energy Performance Rating² (1-100) N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	120,479
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	120,479

Energy Intensity⁵

Site (kBtu/ft ² /yr)	365
Source (kBtu/ft ² /yr)	1219

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	473%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	WPC - Matthews St PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Matthews St, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Matthews PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	330 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 886091532 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/18/2010	08/17/2010	2,400.00
06/18/2010	07/17/2010	2,800.00
05/18/2010	06/17/2010	2,720.00
04/18/2010	05/17/2010	2,600.00
03/18/2010	04/17/2010	3,920.00
02/18/2010	03/17/2010	3,320.00
01/18/2010	02/17/2010	2,800.00
12/18/2009	01/17/2010	3,480.00
11/18/2009	12/17/2009	3,120.00
10/18/2009	11/17/2009	3,040.00
09/18/2009	10/17/2009	2,400.00
886091532 Consumption (kWh (thousand Watt-hours))		32,600.00
886091532 Consumption (kBtu (thousand Btu))		111,231.20
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		111,231.20
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility
WPC - Matthews St PS
Matthews St
Bristol, CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

WPC - Matthews St PS	
Gross Floor Area Excluding Parking: (ft ²)	330
Year Built	1990
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Matthews PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	330
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	365	365	0	N/A	104
Source (kBtu/ft ²)	1219	1219	0	N/A	213
Energy Cost					
\$/year	\$ 2,530.87	\$ 2,530.87	N/A	N/A	\$ 720.95
\$/ft ² /year	\$ 7.67	\$ 7.67	N/A	N/A	\$ 2.18
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

WPC - Minor PS

Building ID: 2495035

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

FacilityWPC - Minor PS
Minor Street
Bristol, CT 06010**Facility Owner**

N/A

Primary Contact for this Facility

N/A

Year Built: 1990**Gross Floor Area (ft²):** 405**Energy Performance Rating² (1-100):** N/A**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	121,352
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	121,352

Energy Intensity⁵

Site (kBtu/ft ² /yr)	300
Source (kBtu/ft ² /yr)	1001

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	370%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	WPC - Minor PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Minor Street, Bristol , CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Minor PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	405 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 886091262 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/18/2010	08/17/2010	960.00
06/18/2010	07/17/2010	1,680.00
05/18/2010	06/17/2010	2,240.00
04/18/2010	05/17/2010	2,400.00
03/18/2010	04/17/2010	4,160.00
02/18/2010	03/17/2010	4,160.00
01/18/2010	02/17/2010	3,440.00
12/18/2009	01/17/2010	4,320.00
11/18/2009	12/17/2009	3,760.00
10/18/2009	11/17/2009	3,760.00
09/18/2009	10/17/2009	2,560.00
886091262 Consumption (kWh (thousand Watt-hours))		33,440.00
886091262 Consumption (kBtu (thousand Btu))		114,097.28
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		114,097.28
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility
WPC - Minor PS
Minor Street
Bristol , CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

WPC - Minor PS	
Gross Floor Area Excluding Parking: (ft ²)	405
Year Built	1990
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Minor PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	405
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	300	300	0	N/A	104
Source (kBtu/ft ²)	1001	1001	0	N/A	213
Energy Cost					
\$/year	\$ 2,455.60	\$ 2,455.60	N/A	N/A	\$ 852.33
\$/ft ² /year	\$ 6.06	\$ 6.06	N/A	N/A	\$ 2.10
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



STATEMENT OF ENERGY PERFORMANCE

WPC - Tyler PS

Building ID: 2495037

For 12-month Period Ending: August 31, 2010¹

Date SEP becomes ineligible: N/A

Date SEP Generated: February 10, 2011

Facility
WPC - Tyler PS
Tyler St
Bristol, CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1990
Gross Floor Area (ft²): 213

Energy Performance Rating² (1-100): N/A

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	75,207
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	75,207

Energy Intensity⁵

Site (kBtu/ft ² /yr)	353
Source (kBtu/ft ² /yr)	1179

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	N/A

Electric Distribution Utility

N/A

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	454%
Building Type	Other

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁶ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	WPC - Tyler PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	Tyler St, Bristol, CT 06010	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Tyler PS (Other)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	213 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	0Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	0(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility:

Fuel Type: Electricity		
Meter: 890071542 (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/17/2010	08/16/2010	1,457.00
06/17/2010	07/16/2010	1,339.00
05/17/2010	06/16/2010	1,246.00
04/17/2010	05/16/2010	1,054.00
03/17/2010	04/16/2010	2,476.00
02/17/2010	03/16/2010	2,408.00
01/17/2010	02/16/2010	2,050.00
12/17/2009	01/16/2010	2,534.00
11/17/2009	12/16/2009	2,171.00
10/17/2009	11/16/2009	1,946.00
09/17/2009	10/16/2009	1,679.00
890071542 Consumption (kWh (thousand Watt-hours))		20,360.00
890071542 Consumption (kBtu (thousand Btu))		69,468.32
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		69,468.32
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility
WPC - Tyler PS
Tyler St
Bristol, CT 06010

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

WPC - Tyler PS	
Gross Floor Area Excluding Parking: (ft ²)	213
Year Built	1990
For 12-month Evaluation Period Ending Date:	August 31, 2010

Facility Space Use Summary

Tyler PS	
Space Type	Other - Other
Gross Floor Area(ft ²)	213
Number of PCs ^o	0
Weekly operating hours ^o	0
Workers on Main Shift ^o	0

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2010)	Baseline (Ending Date 08/31/2010)	Rating of 75	Target	National Average
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft ²)	353	353	0	N/A	104
Source (kBtu/ft ²)	1179	1179	0	N/A	213
Energy Cost					
\$/year	\$ 1,823.80	\$ 1,823.80	N/A	N/A	\$ 537.20
\$/ft ² /year	\$ 8.56	\$ 8.56	N/A	N/A	\$ 2.52
Greenhouse Gas Emissions					
MtCO ₂ e/year	N/A	N/A	N/A	N/A	N/A
kgCO ₂ e/ft ² /year	N/A	N/A	N/A	N/A	N/A

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Other. This building uses X% less energy per square foot than the CBECS national average for Other.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.



PORTFOLIO MANAGER QUICK REFERENCE GUIDE

Portfolio Manager is an interactive energy management tool that allows you to track and assess energy and water consumption across your entire portfolio of buildings in a secure online environment. Use this Quick Reference Guide to identify opportunities for energy efficiency improvements, track your progress over time, and verify results.

IDENTIFY ENERGY EFFICIENCY PROJECTS

Use Portfolio Manager to identify under-performing buildings to target for energy efficiency improvements and establish baselines for setting and measuring progress for energy efficiency improvement projects over time.

STEP	ACTIVITY	ACTION
1	Access Portfolio Manager. (step not shown)	Visit www.energystar.gov/benchmark . Scroll down to the Login section on the right-hand side in the middle of the page.
2	Access your account: (step not shown) • Create a new account. • Login to an existing account.	• Click REGISTER, and follow instructions. • Enter user name and password, and click LOGIN.
3	Review system updates and enter account. (step not shown)	Click ACCESS MY PORTFOLIO , located below Welcome to Portfolio Manager .
4	Add a new facility. (step not shown)	Click ADD a Property, located in the upper right portion of the screen.
5	Select property type and enter general facility information. (step not shown)	Select the option that most closely resembles your facility and click CONTINUE . Enter general data and click SAVE . For more information on facility space types, see: www.energystar.gov/index.cfm?c=eligibility.bus_portfolio/portfolio_manager_space_types .
6	Enter space use data.	From the Facility Summary page, shown above, go to the Space Use section, located half way down the page, and click ADD SPACE . • Enter a facility name. In the Select a Space Type menu, select the appropriate space type(s) for your building. If your space is not listed, select Other. Click CONTINUE. • Enter building characteristics. Click SAVE. Information required for each space type is listed here: www.energystar.gov/index.cfm?c=eligibility.bus_portfolio/portfolio_manager_space_types. • Repeat steps above to add all major spaces in your facility. Use bulk import service to minimize manual data entry of large sets of facility data (10 or more facilities or campuses are required). • Go back to My Portfolio by clicking on the link in the upper left portion of the page. • Click IMPORT Facility Data Using Templates, located below Add a Property.
7	Enter energy use data.	From the Facility Summary page, go to the Energy Meters section, located below the Space Use section, and click ADD METER . • Enter meter name, type, and units. Click SAVE. • Enter number of months and start date. Click CONTINUE. • Enter energy use and cost for each month. Click SAVE. • Repeat for all energy meters and fuel types.

PORTFOLIO MANAGER

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[Home](#) > **My Portfolio**

Group Averages

Baseline Rating: 72 Facilities Included: 1	Current Rating: 80 Facilities Included: 1
Change from Baseline: Group Adjusted Percent Energy Use (%): -14.8% Facilities Included: 2	

Averages are weighted by Total Floor Space.
[More about Baselines](#)
[More about Change from Baseline: Adjusted Energy Use](#)

[Add a Property](#)
[Import Facility Data Using Templates](#)

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[Share Facilities](#)
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My Facilities
My Campuses

GROUP: Fire Stations

8

VIEW: Summary View

9a

[Download](#) in Excel

Search Facility Name:

Search

Results 1 - 2 of 2

All # A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Facility Name	Current Source Energy Intensity (kBtu/Sq. Ft.)	Change from Baseline: Adjusted Energy Use (%)	Change from Baseline: Energy Use Intensity (kBtu/Sq. Ft.)	Change from Baseline: GHG Emissions (MtCO ₂ e)	Total Energy Cost per Sq. Ft. (US Dollars (\$))
Fire Station 1	160.1	-12.3	-6.1	-275.86	\$0.30
Fire Station 2	172.6	-17.2	-10.7	-488.62	\$0.37

[Download](#) in Excel

9b

Search Facility Name:

Search

Results 1 - 2 of 2

All # A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

The rating is calculated by using the last day of the latest full calendar month where all meters in the facility have meter entries; the Period Ending date reflects that particular date.

STEP	ACTIVITY	ACTION
8	Create custom groups.	Organize facilities into groups (e.g., Fire Stations, Northwest Region). Groups are completely customizable, and each facility may belong to multiple groups. - From the My Portfolio page, click CREATE GROUP, located directly to the right of the Group drop-down menu. - Follow instructions to select buildings and name your group. - Once they have been saved, custom groups will be available in the Group drop-down menu.
9	View and interpret results.	Option 1: Go to My Portfolio and view all buildings to compare performance metrics. Option 2: Export data to Microsoft® Excel. - On the My Portfolio page, select the view, from the View drop-down menu that will display the data you wish to export. The My Portfolio page will update to display the selected view. (9a) - Select the DOWNLOAD IN EXCEL link. A File Download dialog window will open. Follow the steps provided by Excel. (9b) - Use Excel functionality to view building energy performance graphically. The example below shows a comparison of Energy Use Intensity for a portfolio of fire stations, identifying under-performing buildings to target for energy efficiency improvements.

TRACK PROGRESS OVER TIME

Portfolio Manager comes pre-populated with nine standard summary views of facility data, which are displayed on the My Portfolio summary page. These standard views include:

- Summary: Energy Use
- Performance: Green House Gas Emissions
- Performance: Financial
- Performance: Water Use

Additionally, users can create and save custom downloadable views by choosing from more than 70 different metrics. The default view set by the user will display automatically after logging into Portfolio Manager, and data from all views can be exported to Microsoft® Excel.

PORTFOLIO MANAGER

Home > My Portfolio

GROUP: Fire Stations | Create Group | Edit Group | View All

VIEW: MyView | **Create View** | Edit View | View All

Download in Excel

Results 1 - 2 of 2

Facility Name	Number of Students	% Difference from National Average Source EUI	Baseline Weather Normalized Source Energy Intensity (kBtu/Sq. Ft.)	Current Weather Normalized Source Energy Intensity (kBtu/Sq. Ft.)	Baseline Rating (1-100)	Current Rating (1-100)	Total Floor Space (Sq. Ft.)
Fire Station 1	0	-32.6	180.4	160.1	72	80	300,000
Fire Station 2	0	9.9	208.4	172.6	N/A	N/A	300,000

PORTFOLIO MANAGER

Home > My Portfolio > Create New View

Create New View
How do I use this page?

Number of Facilities to display on each page:
☐ 25 ☒ 50 ☐ 100 ☐ All (note: larger Portfolios will take longer to load)

To create/edit a custom View of your facilities in Portfolio Manager, select **up to 7** columns from the list below. Use "Preferred Column Order" to set the order in which they will display in the View.

View Name: **Set this View as My Portfolio Default:** ☐

Preferred Column Order	Facility Data	Preferred Column Order	Facility Data
1	ENERGY STAR Rating	1	Water
2	Baseline Rating (1-100) (N/A for Campuses)	2	Indoor Water Cost (US Dollars (\$))
3	Current Rating (1-100) (N/A for Campuses)	3	Indoor Water Use (kGal)
4	Target Rating (1-100) (N/A for Campuses)	4	Indoor Water Use per Sq. Ft. (kGal)
5	Period Ending Dates	5	Outdoor Water Cost (US Dollars (\$))
6	Baseline Energy Period Ending Date	6	Outdoor Water Use (kGal)
7	Current Energy Period Ending Date	7	Total Indoor and Outdoor Water Cost (US Dollars (\$))
8	Water Use Period Ending	8	Total Indoor and Outdoor Water Use (kGal)
9	Site Energy	9	Wastewater/Sewer Cost (US Dollars (\$))
10	Baseline Site Electric Use (kWh)	10	Wastewater/Sewer Use (kGal)
		11	Water Use Alerts (N/A for Campuses)
		12	Performance: GHG Emissions

CREATE A CUSTOM VIEW

STEP ACTION

- From the **My Portfolio** page or the **Facility Summary** page, select the **Create View** link, located directly to the right of the **View** drop-down menu.
- Enter a name for the view. To set as the default view, select the box labeled **Set this View as My Portfolio Default**, located directly to the right of **View Name**. You may include up to 7 (seven) columns in each view.
- Choose each metric to be included in the view by selecting an order number from the **Preferred Column Order** drop-down menu to the left of the **Facility Data** column.
- Click **SAVE** at the bottom of the page. You will be returned to the **My Portfolio** page, and your custom view will be available in the **View** drop-down menu. (step not shown)

VERIFY AND DOCUMENT RESULTS

Use Portfolio Manager to quickly and accurately document reductions in energy use, greenhouse gas emissions, water use, and energy costs for an individual building or an entire portfolio. This valuable information can be used to provide a level of transparency and accountability to help demonstrate strategic use of funding.

Generate a Statement of Energy Performance that includes valuable information about your building's performance, including:

- Normalized energy use intensity
- National average comparisons
- Greenhouse gas emissions
- Energy performance rating (if available)

In addition, you can also request an Energy Performance Report to see the change in performance over time for selected buildings or an entire portfolio. Available comparative metrics in this report include:

- Normalized energy use intensity
- Total electric use
- Total natural gas use
- Energy performance rating (if available)

OMB No. 2050-0347

STATEMENT OF ENERGY PERFORMANCE Fire Station 2

Building ID: 1642681
For 12-month Period Ending: December 31, 2008¹
Date SEP becomes ineligible: N/A

Date SEP Generated: March 05, 2009

Facility Fire Station 2 000 Blank Street Arlington, VA 22209	Facility Owner N/A	Primary Contact for this Facility N/A
Year Built: 1990 Gross Floor Area (ft ²): 300,000	Energy Intensity⁵ Site (kBtu/ft ² /yr) 52 Source (kBtu/ft ² /yr) 173	
Energy Performance Rating ² (1-100)	Emissions (based on site energy use) Greenhouse Gas Emissions (MTCO ₂ e/year) 2,352	
Site Energy Use Summary³ Electricity (kBtu) 15,500,000 Natural Gas (kBtu) Total Energy (kBtu)	Energy Intensity⁴ Site (kBtu/ft ² /yr) 62 Source (kBtu/ft ² /yr) 173 Emissions (based on site energy use) Greenhouse Gas Emissions (MTCO ₂ e/year) 2,352	
Electric Distribution Utility Virginia Electric & Power Co National Average Comparison National Average Site EUI 78 National Average Source EUI 157 % Difference from National Average Source EUI 10% Building Type Fire Station/Police Station	Stamp of Certifying Professional Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate. Certifying Professional N/A	
Meets Industry Standards⁶ for Indoor Environmental Conditions: Ventilation for Acceptable Indoor Air Quality N/A Acceptable Thermal Environmental Conditions N/A Adequate Illumination N/A		

Notes:
1. Application for the ENERGY STAR award is submitted by EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Intensity values are calculated as follows: Intensity = Total Energy / Gross Floor Area (kBtu/ft²/yr).
6. See ASHRAE 90.1-2001, Table 6.1 for more information.

ENERGY STAR **PORTFOLIO MANAGER**

Home > My Portfolio > Fire Station 2

Facility Summary: **Fire Station 2**
[How do I use this page?](#)

Building ID: 1642681
Level of Access: Building Data Administrator

Electric Distribution Utility: Virginia Electric & Power Co
Regional Power Grid: [SERC Virginia/Carolina](#)
[Select my Power Generation Plant](#) to calculate my electric emissions rate
Electric Emissions Rate (lbCO₂/kWh) 151.7 ([what is this?](#))

1 [Generate a Statement of Energy Performance](#) for uses other than applying for the ENERGY STAR

General Information Edit	
Address: 000 Blank Street, Arlington, VA 22209	
Year Built: 1990	
Property Type: Single Facility	
Baseline Rating: N/A	Current Rating: N/A
Eligibility for the ENERGY STAR	
N/A	

GENERATE A STATEMENT OF ENERGY PERFORMANCE AND AN ENERGY PERFORMANCE REPORT

STEP	ACTION
1	From your selected building's Facility Summary page, click GENERATE A STATEMENT OF ENERGY PERFORMANCE .
2	On the next page, select a period ending date. (step not shown)
3	Click GENERATE REPORT , located in the bottom right corner of the screen. (step not shown)
4	Save the Statement of Energy Performance, accompanying Data Checklist, and Facility Summary that include information on energy use intensity and greenhouse gas emissions.
5	From the My Portfolio page, click REQUEST ENERGY PERFORMANCE REPORT , located under Work with Facilities , which shows reductions in key performance indicators over a user-specified time period. Specify the type of report, the facilities to be included, and the requested report columns. The report will be e-mailed to a user-specified address within one business day. (step not shown)

APPENDIX C

Water and Wastewater Process Analysis

Bristol CT WPCF - UV Disinfection System

 Prepared By: M.Messmann

 Date: 10/14/2010

Power for 1 Unit (4 modules)	39.2 kVA
Assumed Power Factor	80%
Power Consumption for 1 Unit	31 kW

Flow Capacity per UV Unit	8.3 MGD
Flow Capacity per Module	2.1 MGD

\$/kWh	\$0.15

Disinfection Period (April through October)	Avg Plant Flow (MGD)	# of Lamp Modules Required	Projected Monthly Electrical Consumption (kWh) ¹	Actual Annual Electric Consumption (kWh) ²	Current Monthly Cost	Projected Monthly Cost	Electrical Cost Savings
Aug-08	7.1	4	22,956	22,956	\$3,535.15	\$3,535.15	\$0.00
Apr-09	8.8	5	28,694	45,911	\$7,070.30	\$4,418.94	\$2,651.36
May-09	8.2	4	22,956	22,956	\$3,535.15	\$3,535.15	\$0.00
Jun-09	9.2	5	28,694	45,911	\$7,070.30	\$4,418.94	\$2,651.36
Jul-09	10.9	6	34,433	45,911	\$7,070.30	\$5,302.73	\$1,767.58
Aug-09	8.8	5	28,694	45,911	\$7,070.30	\$4,418.94	\$2,651.36
Apr-10	12.6	6	34,433	45,911	\$7,070.30	\$5,302.73	\$1,767.58
May-10	7.6	4	22,956	22,956	\$3,535.15	\$3,535.15	\$0.00
Jun-10	6.6	4	22,956	22,956	\$3,535.15	\$3,535.15	\$0.00
Jul-10	5.8	3	17,217	22,956	\$3,535.15	\$2,651.36	\$883.79
2009 total:			143,472	206,600	\$31,816.35	\$22,094.69	\$9,721.66

1. With flow pacing ability on existing UV units.

2. Actual Annual Consumption assumes all 4 modules run per unit.

APPENDIX D

HVAC Equipment Inventories

City Hall HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler (x2)	Mechanical Room	Building	Columbia	MPH-60	80%	3	30
ACCU	Outside	Phone Room	Mitsubishi	MU09TW	Unknown	Unknown	20
ACCU	Data Center Roof	Data Center	Liebert	280.316.850	Unknown	Unknown	20
ACCU	Outside	Vault	Liebert	PFH020A-PL3	Unknown	Unknown	20
ACCU	Outside	Computer Room	EDPAC	PFGS	Unknown	Unknown	20
Water Cooled Chiller	Mechanical Room	Building	Trane	CGWBD181ECNPN80E GTGP	Unknown	Unknown	20
Cooling Tower	Roof	Chiller	BAC	U095284301	Unknown	1	20
Gas DHW	Boiler Room	Domestic Hot Water Lines	Bradford White	125,000 BTU/hr; 75 Gallons	Unknown	Unknown	-
Electric DHW	Storage Room	Domestic Hot Water Lines	Kenmore	5,500 Watts; 30 Gallons	Unknown	Unknown	-

City Hall Annex HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Furnace	Garage	Garage	Unknown	KG GRA 96 C-16B	82.3%	2	18
Furnace	Garage	Garage	Airease	160 MBH Input Capacity	80.5%	2	18

Water Department Office & Garage HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
ACCU	Roof	Server Closet	Sanyo	Unknown	Unknown	1	20
ACCU	Roof	Building	Heil	HAC048AKA4	Unknown	1	20
Rooftop Packaged Heat/Cool Unit	Roof	Offices	Carrier	50PA012510AA	Unknown	23	15
Hot Water Unit Heater	Lobby/Lockers	Lobby/Lockers	Sterling	HS-180	Unknown	Unknown	20
Hot Water Boiler	Lobby/Lockers	Lobby/Lockers	A.O. Smith	19A-S/W-05	80%	Unknown	35
Hot Water Unit Heater	Break Room	Break Room	Modine	HS-63501	Unknown	Unknown	20
Gas Unit Heater (x2)	Garage	Garage	Modine	Unknown	80%	Unknown	13
Gas Unit Heater	Left Garage	Left Garage	Reznor	Unknown	80%	Unknown	13
Electric DWH	Basement	Domestic Hot Water Lines	AO Smith	4,500 Watts; 40 Gallon	Unknown	10	-

Water Filtration Plant HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Chiller	Basement	Basement	Trane	CGWCC301MDNDD323BDFMPT	Unknown	Unknown	20
Hot Water Boiler	Mechanical Room	Building	Crown	VH-11	80%	Unknown	35
Hot Water Heater	Basement Mech Room	Bay Floor	State	4,500 Watts	Unknown	Unknown	-
Hot Water Unit Heater	Mechanical Room	Mechanical Room	Trane	Unknown	Unknown	Unknown	20
Hot Water Unit Heater	Basement	Basement	Trane	Unknown	Unknown	Unknown	20
Hot Water Unit Heater (x2)	Basement	Basement	Modine	HS 86S01	Unknown	Unknown	20
Hot Water Unit Heater	Generator Room	Generator Room	Trane	Unknown	Unknown	Unknown	20
Hot Water Unit Heater	Chemical Room	Chemical Room	Trane	UHSA-060-8C-AAC	Unknown	Unknown	20

Water Filtration Plant HVAC Equipment Service Lives							
Gas Fired Unit Heater (x4)	Garage	Garage	Unknown	Unknown	80%	Unknown	13
Hot Water Unit Heater	Stairwell	Stairwell	Trane	Unknown	Unknown	Unknown	20

High Pump House HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Oil Fired Boiler	Pump House	Pump House	Dunkirk	Empire II 178 MBH	82.4%	10	20

Barlow Well House HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Well House	Well House	QMark	Unknown	100%	Unknown	13

Hill Street Generator Building HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Generator Building	Generator Building	Unknown	9K953A	100%	Unknown	13

Wolcott Well House HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Well House	Well House	QMark	MUH074	100%	Unknown	13

Hill Street Well House HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Well House	Well House	Singer	UHS-10 10kW	100%	Unknown	13
Oil Fired Boiler	Well House	Well House	Dunkirk	4EW150T	80%	Unknown	35

Peck Lane Well House HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater (x2)	Well House	Well House	Task Master	P3P5107CAIN	100%	Unknown	13

Mix Street Well House HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Well House	Well House	Electromode	5 kW	100%	Unknown	13
Electric Unit Heater	Chemical Room	Cheimcal Room	QMark	5 kW	100%	Unknown	13

Mix Street Generator House HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Generator Room	Generator Room	QMark	MUH0704 7.5kW	100%	Unknown	13

Mix Street Well House #3 HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Well House	Well House	Berko	5kW	100%	Unknown	13

Mix Street Well House #4 HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Well House	Well House	Berko	5kW	100%	Unknown	13

Mix Street Well House #5 HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Well House	Well House	Berko	5kW w/ Integral Thermostat	100%	Unknown	13

Mechanic Street Well House #2 HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Well House	Well House	Unknown	5kW	100%	Unknown	13

Generator Room #2 HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Generator Room	Generator Room	QMark	MUH-10-4 10kW	100%	Unknown	13

Police Department HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler	Mechanical Room	Domestic Hot Water Lines in Summer	Weil McLain	478	81%	10	35
Boiler (x2)	Mechanical Room	Building	Smith	350 Mills	82.5%	Unknown	35
ACCU	Outside	First Floor Communication	Unknown	Unknown	Unknown	Unknown	20
ACCU	Roof	Basement AHU	Trane	RAVA-2504-MC	Unknown	Unknown	20
ACCU	Outside	Data Room	Data Aire Inc	DRCV-0534	Unknown	10	20
Electric Unit Heaters	Stairwells	Stairwells	Unknown	10 kW	100%	Unknown	13
Hot Water Unit Heater	Basement Sump Pump Room	Basement Sump Pump Room	Trane	Unknown	Unknown	Unknown	20
Hot Water Unit Heater (x3)	Weight Room	Weight Room	Trane	UHSA-0905-8A-AAE	Unknown	Unknown	20
Hot Water Unit Heater	Bathroom	Bathroom	Trane	UHSA-0389-3A-AA0	Unknown	Unknown	20
Hot Water Unit Heater	Mechanical Closet	Mechanical Closet	Trane	UHSA-0389-8A-AAG	Unknown	Unknown	20
Hot Water Unit Heater	3 rd Floor Garage	3 rd Floor Garage	Trane	Unknown	Unknown	Unknown	20
Hot Water Unit Heater	3 rd Floor Old Chiller Room	3 rd Floor Old Chiller Room	Trane	UHSA-126W-2C-AAF	Unknown	Unknown	20
Hot Water Unit Heater	Generator Room	Generator Room	Trane	Unknown	Unknown	Unknown	20
Hot Water Unit Heater (x2)	Police Maintenance	Police Maintenance	Trane	UHSA-0385-8A-AA0	Unknown	Unknown	20
Hot Water Unit Heater	Elevator Room	Elevator Room	Trane	UHSA-0385-8A-AA0	Unknown	Unknown	20
Water Cooled Chiller	3 rd Floor	1 st and 2 nd Floor	Trane	RTHB150FMC00NW000 UNN3LF2LF000N	Unknown	Unknown	23
Cooling Tower	Roof	Chiller	Marley	SH-22-54-4870	Unknown	Unknown	20
Gas DHW	Closet of Parking Garage	Domestic Hot Water Lines	Rheem	350,000 BTU/hr; 116 Gallons	Unknown	3	-

Rockwell Park HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler	Mechanical Room	Building	Burnham	Unknown	83.5%	Unknown	35
ACU (thru wall)	Office	Office	Crosley	1 Ton	Unknown	20	10
ACU (thru wall)	Garage	Garage	Fedders	2 Ton	Unknown	20	10
Hot Water Unit Heater	Locker Room	Locker Room	Trane	Unknown	Unknown	Unknown	20
Hot Water Unit Heater	Garage	Garage	Trane	Unknown	Unknown	Unknown	20
Electric DHW	Mechanical Room	Domestic Hot Water Lines	Hot Point	3,800 Watts; 40 Gallons	Unknown	Unknown	-

Rockwell Pavilion HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Furnace	Mechanical Room	Large Room	International	OHB6F097-130-5/BHF-6	93.5% AFUE	Unknown	18
Furnace	Mechanical Room	Remaining Building	International	OHB6F059-085-5/BHF-5	93.5% AFUE	Unknown	18
Electric DHW	Mechanical Room	Domestic Hot Water Lines	General Electric	4,500 Watts; 40 Gallons	Unknown	Unknown	-

Bathhouse HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Men's Bathroom	Men's Bathroom	Unknown	4 kW	100%	Unknown	13
Electric Unit Heater	Women's Bathroom	Men's Bathroom	Unknown	4 kW	100%	Unknown	13
Electric DHW	Concession	Domestic Hot Water Lines	Bradford White	4,500 Watts; 30 Gallons	Unknown	Unknown	-

Muzzy Field HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)

Electric Unit Heater	Bathroom	Bathroom	Unknown	Unknown	100%	Unknown	13
Electric Unit Heater	Locker Room	Locker Room	Federal Pacific	Unknown	100%	Unknown	13
Electric Unit Heater	Fertilizer Room	Fertilizer Room	Q Mark	5 kW	100%	Unknown	13
Electric Unit Heater	Officials Room	Officials Room	Q Mark	5 kW	100%	Unknown	13
Electric Unit Heater	Home Locker Room	Home Locker Room	Emerson	7.5 kW	100%	Unknown	13
PTAC (x2)	Press Box	Press Box	Zone-Aire	TEA09K345TA	Unknown	20	15
A/C Unit	Snack Stand	Snack Stand	Haier	Unknown	Unknown	Unknown	10
Gas DHW	Home Locker Room	Domestic Hot Water Lines	Vanguard	36,000 BTU/hr; 50 Gallons	Unknown	Unknown	-
Gas DHW	Officials Bathroom	Domestic Hot Water Lines	AO Smith	40,000 BTU/hr; 38 Gallons	Unknown	Unknown	-
Electric DHW	Power Room	Domestic Hot Water Lines	Hubbell	120 Gallons	Unknown	Unknown	-

Ski Lodge HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater (x2)	Main Floor	Main Floor	Singer	UHS-3	100%	Unknown	13
Electric DHW	Bathroom	Domestic Hot Water Lines	AO Smith	6 Gallons	Unknown	Unknown	-

Page Park Pavilion HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler	Mechanical Room	Building	Weil McLain	480 MBH Capacity	80%	30	35
Electric DHW	Mechanical Room	Domestic Hot Water Lines	AO Smith	6,000 Watts; 20 Gallon	Unknown	Unknown	-

Recreation Building HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Gas Fired Unit Heater (x2)	Main Floor	Main Floor	Unknown	60 MBH	80%	Unknown	13
Electric DHW	Mechanical Room	Domestic Hot Water Lines	AO Smith	6,000 Watts; 20 Gallon	Unknown	Unknown	-

Fire Headquarters HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler	Mechanical Room	Building	AO Smith	Cast Iron; 1,137 MBH Capacity	81%	Unknown	35
ACU (thru wall)	2 nd Floor Bedroom	2 nd Floor Bedroom	Westpoint	Unknown	Unknown	Unknown	15
ACU (thru wall)	Chief Administration Assistant Office	Chief Administration Assistant Office	Frigidaire	10,000 BTU	10.8 EER	Unknown	15
ACU (thru wall)	Office beside Break Room	Office beside Break Room	Frigidaire	Unknown	Unknown	Unknown	15
Hot Water Unit Heater (x6)	Bay Floor	Bay Floor	Trane	Unknown	Unknown	Unknown	20
ACCU	Outside	Unknown	Carrier	38CKB042500	Unknown	Unknown	20
Electric DHW	Mechanical Room	Domestic Hot Water Lines	Phase III	Indirect; 75 Gallons	Unknown	Unknown	-
Electric DHW	Mechanical Room	Domestic Hot Water Lines	AO Smith	4,500 Watts; 80 Gallons	Unknown	Unknown	-

Engine 2 HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler	Mechanical Room	Building	HB Smith	25 Mills	80%	Unknown	35
ACU (thru wall)	Bunk	Bunk	Kenmore	Mod# 253.71123; 12,000 BTU/hr	9.5 EER	Unknown	15
ACU (thru wall)	Break room	Break room	Unknown	Unknown	Unknown	Unknown	15
Hot Water Unit Heater (x2)	Engine Room	Engine Room	Modine	S280	Unknown	Unknown	20
Hot Water Unit Heater	Laundry	Laundry	Modine	S280	Unknown	Unknown	20
Hot Water Unit Heater (x2)	50 PS Vehicle	50 PS Vehicle	Modine	S280	Unknown	Unknown	20
Electric DHW	Mechanical Room	Domestic Hot Water Lines	AO Smith	4,500 Watts; 40 Gallons	Unknown	Unknown	-

Engine 3 HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler	Mechanical Room	Building	Weil McLain	FG55P1	80%	Unknown	35
ACU (thru wall)	Bunk	Bunk	Westinghouse	24,000 BTU/hr	Unknown	Unknown	15
ACU (thru wall)	Break room	Break room	Unknown	Unknown	Unknown	Unknown	15
Panel Radiator (x3)	Engine Room	Engine Room	Panel Block	CB 125F-4	Unknown	Unknown	25
Electric DHW	Mechanical Room	Domestic Hot Water Lines	General Electric	4,500 Watts; 40 Gallons	Unknown	4	-

Engine 4 HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler	Mechanical Room	Building	HB Smith	19 Series	80%	Unknown	35
ACU (thru wall)	Classroom	Classroom	Frigidaire	Unknown	Unknown	Unknown	15
ACU (thru wall)	Workout/ Bedroom	Workout/ Bedroom	Frigidaire	Unknown	Unknown	Unknown	15
ACU (thru wall)	Break Room	Break Room	Unknown	2 ton	Unknown	Unknown	15
Electric Cabinet Heater	Bathroom	Bathroom	Chromolox	5 kW	Unknown	Unknown	13
Hot Water Unit Heater	Classroom	Classroom	Carrier	Unknown	Unknown	Unknown	20
Hot Water Unit Heater	Garage	Garage	Carrier	Unknown	Unknown	Unknown	20
Electric DHW	Mechanical Room	Domestic Hot Water Lines	AO Smith	4,500 Watts; 40 Gallons	Unknown	Unknown	-

Engine 5 HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler	Mechanical Room	Building	HB Smith	19 Series	80%	Unknown	35
ACU (thru wall)	Break Room	Break Room	Panasonic	CW-1803SU	8.8 EER	16	15
ACU (thru wall)	Bunk	Bunk	Frigidaire	Unknown	Unknown	Unknown	15
Hot Water Unit Heater (x2)	Garage	Garage	Carrier	46S245239	Unknown	Unknown	20
Electric DHW	Mechanical Room	Domestic Hot Water Lines	General Electric	4,500 Watts; 40 Gallons	Unknown	5	-

Senior Center HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler	Boiler Room	Building	Weil McLain	3753 MBH Input Capacity	80%	Unknown	35
Rooftop AC Unit	Roof	Billiards/ Meals on Wheels	Carrier	Unknown	Unknown	Unknown	15
Rooftop AC Unit	Roof	Main Office	Carrier	50CK5036721B	Unknown	Unknown	15
Rooftop AC Unit	Roof	Senior Wing	Carrier	50CD00960HZ	Unknown	Unknown	15
Rooftop AC Unit	Roof	Day Care	Carrier	48CH501362REV	Unknown	Unknown	15
ACU (thru wall) (x2)	Ceramics	Ceramics	Unknown	Unknown	Unknown	Unknown	10
ACU (thru wall)	Board of Education Office	Board of Education Office	Frigidaire	FAK124RIV	9.5 EER	Unknown	10
ACU (thru wall) (x4)	West Wing	West Wing	Unknown	Unknown	Unknown	Unknown	10
Portable AC Unit	Server Room	Server Room	Everstar	MPM2-10CR-BB6	9 EER	Unknown	10
Hot Water Unit Heater (x2)	Side Vestibule	Side Vestibule	Unknown	Unknown	Unknown	Unknown	20
ACCU	Courtyard	Health Department, Fitness Room, Daycare	Carrier	38AE012500	9.3 EER	23	20
ACCU	Courtyard	East Wing	York	H1CB024S06B	Unknown	21	20
ACCU	Courtyard	Wellness Offices	Carrier	38EH042510DL	Unknown	Unknown	20
ACCU	Courtyard	Senior Wing	Carrier	38BP007550	Unknown	Unknown	20
ACCU	Courtyard	Senior Wing	Carrier	38BA008540	Unknown	Unknown	20
Packaged AC Unit	Outside	Gym	Trane	TCH210C300EA	Unknown	4	15
Hot Water Unit Heater (x6)	Gym	Gym	Unknown	Unknown	Unknown	Unknown	20
Gas DHW	Boiler Room	Domestic Hot Water Lines	AO Smith	275,000 BTU/hr; 100 Gallons	Unknown	13	-

Main Library HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler (x2)	Mechanical Room	Building	HB Smith	28HE-S/W-06	80%	Unknown	35
Cooling Tower	Outside	Chiller	Cooling Technology	ECS2-120	Unknown	5	20
Rooftop Heating/ AC Unit	Roof	History Room	Trane	YSC048A3RMA1GD100 A1A0030	80% Heat	4	15
Energy Recovery Unit	Roof	North Wing	Innovent	ES0001E/SP/WH-10000-CW/FR/VS-1-A	Unknown	Unknown	15
Energy Recovery Unit	Roof	South Wing	Innovent	100-ACF100C3B7 0ACF70C3B	Unknown	Unknown	15
Hot Water Unit Heater	Mechanical Room	Mechanical Room	Trane	UHSA020W2EAAIT0000 000	Unknown	Unknown	20
Electric Unit Heater	Stairwell	Stairwell	Unknown	FPQ2205	100%	Unknown	13
ACCU	Outside	Building	Mitsubishi	Unknown	Unknown	Unknown	20
Air Handling Unit	Mechanical Room	Building	Innovent	E5000-1C/SP/HW-6000-CW/HW/FR/VS/1-F	Unknown	Unknown	-
Air Handling Unit	Mechanical Room	Building	Trane	MECB003UA0A04A	Unknown	Unknown	-
Hot Water Unit Heater	Water Meter Room	Water Meter Room	Trane	UHSA-038	Unknown	Unknown	20
Hot Water Unit Heater	Water Meter Room	Water Meter Room	Trane	UHSA-060	Unknown	Unknown	20
Hot Water Unit Heater	Storage	Storage	Trane	UHSA060W12EAA11	Unknown	Unknown	20
ACU	Data Closet	Data Closet	Mitsubishi	Mr. Slim	Unknown	Unknown	10
Electric DHW	Maintenance Office	Domestic Hot Water Lines	Bradford White	4,500 Watts; 30 Gallons	Unknown	Unknown	-
Electric DHW	Mechanical Room	Domestic Hot Water Lines	Bradford White	4,500 Watts; 30 Gallons	Unknown	Unknown	-

Manross Library HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler	Mechanical Room	Building	HB Smith	25 Mills	81.5%	Unknown	35
Air Handling Unit	Mechanical Room	1 st Floor	Trane	BRCA2006	Unknown	Unknown	-
Air Handling Unit	Basement	Basement	Trane	SAUA-1506A	Unknown	Unknown	-
Air Cooled Chiller	Outside	Air Handling Units	Unknown	CRHM200ATD396	Unknown	Unknown	20
Electric DHW	Penthouse	Domestic Hot Water Lines	AO Smith	1,500 Watts; 6 Gallons	Unknown	Unknown	-
Electric DHW	Basement Mechanical Room	Domestic Hot Water Lines	Bradford White	1,500 Watts; 6 Gallons	Unknown	Unknown	-

Youth Services HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Air Handling Unit	Basement	1 st Floor	First Co.	33 MBH	Unknown	Unknown	-
Air Handling Unit	Attic	2 nd Floor	First Co.	60MBXB-HW	Unknown	Unknown	-
ACCU	Roof	2 nd Floor	American Standard	2A7A4060A1000AA	14 SEER	7	20
ACCU	Outside	Unknown	American Standard	2A7A4030A1000AA	Unknown	7	20
ACCU	Outside	Unknown	American Standard	2A7A4018A1000AA	Unknown	Unknown	20
ACCU	Outside	Unknown	American Standard	2A7A403A1000AA	Unknown	Unknown	20
ACCU	Roof	1 st Floor	American Standard	2A7A4030A1000AA	Unknown	7	20
Electric Unit Heater	Stairwell	Stairwell	QMark	Unknown	100%	Unknown	13
Boiler	Basement	Domestic Hot Water	Peerless	347,000 BTU/hr	Unknown	Unknown	-
Indirect DHW	Basement	Domestic Hot Water Lines	Triangle Tube	30 Gallons	Unknown	Unknown	-

Animal Control HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Furnace	Mechanical Room	Office	Comfort Aire	Conquest 90	93.5% AFUE	Unknown	18
Portable AC Unit	Office	Office	Everstar	MPK-10CR	9.5 EER	Unknown	10
Gas Fired Unit Heater (x2)	Kennels	Kennels	Carrier	75,000 MBH Input Capacity	80%	Unknown	13
Gas DHW	Basement	Domestic Hot Water Lines	AO Smith	75,100 BTU/hr	80% AFUE	Unknown	-

Hill Street HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Boiler	Basement Mechanical Room	Building	HB Smith	Unknown	80%	Unknown	35
ACU (thru wall) (x2)	Floor	Not Used	Carrier	Unknown	Unknown	Unknown	10
Electric DHW	Bathroom	Domestic Hot Water Lines	Unknown	Unknown	Unknown	Unknown	-

City Yard HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
ACU (thru wall)	Office	Office	Unknown	Unknown	Unknown	Unknown	10
ACU (thru wall)	Office	Office	Emerson	Unknown	Unknown	30	10
ACU (thru wall)	Street Division Office	Street Division Office	Goldstar	Unknown	Unknown	Unknown	10
ACU (thru wall)	Solid Waste Division Office	Solid Waste Division Office	Carrier	Unknown	Unknown	Unknown	10
ACU (thru wall)	Conference Room	Conference Room	Carrier	Unknown	Unknown	Unknown	10
ACU (thru wall)	Lunch Room	Lunch Room	Unknown	Unknown	Unknown	Unknown	10
ACU (thru wall) (x2)	Carpenter Shop	Carpenter Shop	Unknown	Unknown	Unknown	Unknown	10
Rooftop Packaged Heat Unit	Roof	Office Area	Unknown	Unknown	Unknown	Unknown	15
Gas Fired Unit Heater	Garage Parts Room	Garage Parts Room	Sterling	QVF-40	81	24	13
Gas Fired Unit Heater	Garage Next to Offices	Garage Next to Offices	Reznor	Unknown	Unknown	1	13
Gas Fired Unit Heater (x2)	Garage Next to Offices	Garage Next to Offices	Modine	Effinity 93	Unknown	Unknown	13
Gas Fired Unit Heater	2 nd Garage	2 nd Garage	Sterling	QV2	Unknown	Unknown	13
Gas Fired Unit Heater	2 nd Garage Oil Storage	2 nd Garage Oil Storage	Sterling	QV2	Unknown	Unknown	13
Gas Fired Unit Heater	2 nd Garage Storage	2 nd Garage Storage	Sterling	QV2	Unknown	Unknown	13
Gas Fired Unit Heater	2 nd Garage	2 nd Garage	Modine	High Efficiency	Unknown	Unknown	13
Gas Fired Unit Heater (x6)	2 nd Garage	2 nd Garage	Modine	Hot Dawg	Unknown	Unknown	13
ACU (thru wall)	2 nd Garage 2 nd Floor Office	2 nd Garage 2 nd Floor Office	Unknown	Unknown	Unknown	Unknown	10
Electric DHW	Locker Room	Domestic Hot Water Lines	AO Smith	4,500 Watts; 50 Gallons	Unknown	Unknown	-

Transfer Station Office and Scale House HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
PTAC (x3)	Office	Office	General Electric	AZ38H12DABM1	11.5 EER COP 3.4	5	15
ACU (thru wall)	Scale House	Scale House	Carrier	2 Ton	Unknown	Unknown	10
Electric DHW	Office	Domestic Hot Water Lines	General Electric	1,800 Watts; 5 Gallons	Unknown	Unknown	-

Transfer Station Quonset Hut HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Oil Unit Heater	Hut	Hut	Unknown	Unknown	Unknown	Unknown	18

WPC Administration Building HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
PTAC (x5)	Building	Building	Snyder	NE15CSC	Unknown	Unknown	15
Electric Unit Heater (x2)	Bathrooms	Bathrooms	Chromalox	Unknown	100%	Unknown	13
Electric DHW	Server Room	Domestic Hot Water Lines	AO Smith	1,500 Watts; 15 Gallons	Unknown	Unknown	-

WPC Operations Building HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Front Vestibule	Front Vestibule	Chromalox	Unknown	100%	Unknown	13
Electric Radiant Heater	Lab Office	Lab Office	Unknown	Unknown	100%	Unknown	10
Electric Unit Heater	Back of Building	Back of Building	Unknown	Unknown	100%	Unknown	13
Rooftop Packaged Heat Unit (x2)	Roof	Building	Reznor	Unknown	Unknown	Unknown	18
Rooftop Packaged Cooling Unit	Roof	Building	Trane	SEHDC254KDA0C36DI C0IBEL	Unknown	Unknown	15
Electric DHW	Basement	Domestic Hot Water Lines	Vanguard	2,000 Watts; 20 Gallons	Unknown	Unknown	-

WPC Headworks Building HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Rooftop Packaged Heat Unit	Roof	Building	Reznor	RPBL800-8-M-MV	Unknown	Unknown	18
Rooftop Packaged Heat Unit	Roof	Building	Reznor	HRPB150-8-5-MP	Unknown	9	18
Electric Unit Heater	Top of Pump Room	Building	QMark	Unknown	100%	Unknown	13
Electric DHW	Basement	Domestic Hot Water Lines	AO Smith	3,500 Watts; 120 Gallons	Unknown	Unknown	-

WPC Primary Building HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Gas Unit Heater	Basement	Basement	Modine	PD125AA0111	80%	<6	13
Packaged Heat Unit	On Grade	Building	Reznor	RXE-125-6-SVEAL	80%	Unknown	18
Electric DHW	Basement	Domestic Hot Water Lines	AO Smith	1,500 Watts; 6 Gallons	Unknown	Unknown	-

WPC Secondary Building HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Gas Unit Heater	Pump Room	Pump Room	Reznor	CEEXL125	80%	24	13
Gas Unit Heater	Pump Room	Pump Room	Reznor	Unknown	80%	Unknown	13
Packaged Heat Unit	On Grade	Building	Reznor	RXE250-6-SMVJ	80%	Unknown	18
Electric DHW	Pump Room	Domestic Hot Water Lines	AO Smith	1,500 Watts; 6 Gallons	Unknown	Unknown	-

WPC Air Blower Building HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Gas Unit Heater (x2)	Main Floor	Main Floor	Reznor	Unknown	80%	Unknown	13
Electric DHW	Main Floor	Domestic Hot Water Lines	AO Smith	1,500 Watts; 6 Gallons	Unknown	Unknown	-

WPC Pump House Building HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Main Floor	Main Floor	QMark	MUH-10-4	100%	Unknown	13
Electric Unit Heater	Pump Room	Pump Room	Chromalox	15 kW	100%	Unknown	13
Air Handler w/ Heat	Main Floor	Pump Room	Reznor	HXE125-8-S-MV-E	80%	Unknown	15
Electric DHW	Main Floor	Domestic Hot Water Lines	AO Smith	1,500 Watts; 6 Gallons	Unknown	Unknown	-

WPC Sludge Thickening Building HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Gas Unit Heater	1 st Room	1 st Room	Reznor	CEX105	80%	Unknown	13
Gas Unit Heater	2 nd Room	2 nd Room	Modine	15 kW	80%	Unknown	13
Electric Unit Heater	Bathroom	Bathroom	Chromalox	Unknown	100%	Unknown	13
Electric Unit Heater	Basement	Basement	QMark	Unknown	100%	Unknown	13
Electric Unit Heater	Air Blower Room	Air Blower Room	Chromalox	Unknown	100%	Unknown	13
Packaged Heat Unit	Roof	Building	Reznor	RPVE400-5-5MVJ	80%	>20	18

WPC Sludge Disposal Building HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Gas Unit Heater (x2)	Garage	Garage	Reznor	Unknown	80%	Unknown	13
Gas Unit Heater	Compost Facility	Compost Facility	Modine	PD 125	80%	Unknown	13
Gas Unit Heater	Maintenance Storage	Maintenance Storage	Reznor	Unknown	80%	Unknown	13
Gas Unit Heater	Maintenance Storage	Maintenance Storage	Sterling	Unknown	80%	Unknown	13
Electric Unit Heater	Electric Room	Electric Room	Space Mod	5 kW	100%	Unknown	13

Packaged Heat Unit	Roof	Belt Press Room	Reznor	RPVE350-5-5MVJ	80%	Unknown	18
Packaged Heat Unit	Roof	Building	Reznor	RPVE125-5-5MVJ	80%	Unknown	18

WPC Broad Street Pump Station HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Electrical Room	Electrical Room	Chromalox	Unknown	100%	Unknown	13
Electric Unit Heater	Basement	Basement	Chromalox	Unknown	100%	Unknown	13
Electric Unit Heater	Bathroom	Bathroom	Chromalox	Unknown	100%	Unknown	13
Electric DHW	Building	Domestic Hot Water Lines	AO Smith	1,500 Watts; 6 Gallons	Unknown	Unknown	-

WPC Cherry Hill Pump Station HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Pump Station	Pump Station	Berko	HUH-5247	100%	Unknown	13

WPC Cross Pump Station HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Pump Station	Pump Station	Chromalox	Unknown	100%	Unknown	13

WPC Drayla Pump Station HVAC Equipment Service Lives							
Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
No Equipment							

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Pump Station	Pump Station	Chromalox	15 kW	100%	Unknown	13

WPC Middle Pump Station HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Pump Station	Pump Station	Singer	10 kW	100%	Unknown	13

WPC Minor Pump Station HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Pump Station	Pump Station	Chromalox	15 kW	100%	Unknown	13

WPC Tyler Pump Station HVAC Equipment Service Lives

Description	Unit Location	Service Location	Manufacturer	Model	Estimated Efficiency	Estimated Age (Years)	ASHRAE Expected Life (Years)
Electric Unit Heater	Pump Station	Pump Station	QMark	MUH-07-4	100%	Unknown	13

APPENDIX E

HVAC Spreadsheet Analysis Models

Demand Limiting - Dedicated Generator - Muzzy Field

Fuel Rate 17 Gal/hr
 Cost Of Fuel \$1.77 per gal #2

Existing							Proposed				
<u>Month</u>	<u>Day</u>	<u>Month</u>	<u>Day</u>	<u>Delivery Charge</u>	<u>Total kWh</u>	<u>KW</u>	<u>Equiv Hours At Peak Demand</u>	<u>Generator Fuel Usage (gallons)</u>	<u>Generator Fuel Cost (\$)</u>	<u>Electric Cost</u>	<u>Cost Savings</u>
2009											
Sept	17	Oct	16	\$ 3,409.07	5920	211.8	28.0	475.2	\$841.04	\$ 819.20 *	\$1,748.83
Oct	17	Nov	16	\$ 4,208.86	10400	221.3	47.0	798.9	\$1,414.08	\$ 819.20 *	\$1,975.58
Nov	17	Dec	16	\$ 3,250.10	4160	221.3	18.8	319.6	\$565.63	\$ 819.20 *	\$1,865.27
Dec	17	Jan	19	\$ 158.42	800	1.4	571.4	0**	0**	\$ 158.42	\$0.00
2010											
Jan	20	Feb	17	\$ 192.11	860	1.6	537.5	0**	0**	\$ 192.11	\$0.00
Feb	18	Mar	18	\$ 819.20	4000	19.5	205.1	0**	0**	\$ 819.20	\$0.00
Mar	19	Apr	20	\$ 861.92	3840	71.2	53.9	0**	0**	\$ 861.92	\$0.00
Apr	21	May	18	\$ 2,358.32	2080	207.7	10.0	170.2	\$301.33	\$ 819.20 *	\$1,237.79
May	19	June	17	\$ 3,483.83	8800	210.7	41.8	710.0	\$1,256.73	\$ 819.20 *	\$1,407.90
June	18	July	20	\$ 4,473.82	14720	210.6	69.9	1,188.2	\$2,103.16	\$ 819.20 *	\$1,551.46
July	21	Aug	18	\$ 3,340.42	7840	208.0	37.7	640.8	\$1,134.16	\$ 819.20 *	\$1,387.06
Aug	19	Sept	22	\$ 2,465.55	2720	207.0	13.1	223.4	\$395.39	\$ 819.20 *	\$1,250.96
Totals				\$ 29,021.62	66140	1792.1	1,634.2	4,526.3	\$8,011.52	\$8,585.25	\$12,424.85

* Estimated Electric Bill for the electric usage not produced by the Generator.

** Generator not used during these months

Energy Audit Department	City Hall
Energy Audit Building	Data Center

Existing Building Envelope	
Wall Area	200 sqft
Wall Conductivity	0.3 u Value
Window Area	40 sqft
Window Conductivity	1 u Value
Roof Area	0 sqft
Roof Conductivity	0.35 u Value
Floor Area	1000 sqft
Volume	8000 cuft

Set Points	
Heating Set Point	0 deg F
Cooling Set Point	70 deg F

Internal Loads	
Lighting Density	1.00 w/sqft
Equipment Density	25.00 w/sqft
Occupancy	2 people
Occupant Sensible Load	250 btu/person
Infiltration	0.0 cfm
Exhaust	0 cfm

Building Equipment	
Heating System	256,000 Btuh
Heating Efficiency	81.5 %
Cooling System	100000 Btuh
Cooling Efficiency	9.0 EER
Vent Cooling	0 CFM
Vent Power	0 kW

Existing Load Summaries							
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load
deg F	Hours			btuh	btuh	btuh	btuh
102.5	2	0	1	-3,250	-89,238	0	-92,488
97.5	23	0	1	-2,750	-89,238	0	-91,988
92.5	93	0	1	-2,250	-89,238	0	-91,488
87.5	237	0	1	-1,750	-89,238	0	-90,988
82.5	452	0	1	-1,250	-89,238	0	-90,488
77.5	692	0	1	-750	-89,238	0	-89,988
72.5	858	0	1	-250	-89,238	0	-89,488
67.5	753	0	1	250	-89,238	0	-88,988
62.5	735	0	1	750	-89,238	0	-88,488
57.5	671	0	1	1,250	-89,238	0	-87,988
52.5	736	0	1	1,750	-89,238	0	-87,488
47.5	708	0	1	2,250	-89,238	0	-86,988
42.5	756	0	1	2,750	-89,238	0	-86,488
37.5	705	0	1	3,250	-89,238	0	-85,988
32.5	546	0	1	3,750	-89,238	0	-85,488
27.5	340	0	1	4,250	-89,238	0	-84,988
22.5	229	0	1	4,750	-89,238	0	-84,488
17.5	133	0	1	5,250	-89,238	0	-83,988
12.5	57	0	1	5,750	-89,238	0	-83,488
7.5	22	0	1	6,250	-89,238	0	-82,988
2.5	9	0	1	6,750	-89,238	0	-82,488
-2.5	2	1	0	250	-89,238	0	0
-7.5	1	1	0	750	-89,238	0	0
Total	8,760	3	8,757				

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	-123,317	-246,635	21	0	100	0
0	0	0	-122,651	-2,820,965	235	0	100	0
0	0	0	-121,984	-11,344,512	945	0	100	0
0	0	0	-121,317	-28,752,208	2,396	0	100	0
0	0	0	-120,651	-54,534,101	4,545	0	100	0
0	0	0	-119,984	-83,028,928	6,919	0	100	0
0	0	0	-119,317	-102,374,272	8,531	0	100	0
0	0	0	-118,651	-89,343,952	7,445	0	100	0
0	0	0	-117,984	-86,718,240	7,227	0	100	0
0	0	0	-117,317	-78,719,931	6,560	0	100	0
0	0	0	-116,651	-85,854,891	7,155	0	100	0
0	0	0	-115,984	-82,116,672	6,843	0	100	0
0	0	0	-115,317	-87,179,904	7,265	0	100	0
0	0	0	-114,651	-80,828,720	6,736	0	100	0
0	0	0	-113,984	-62,235,264	5,186	0	100	0
0	0	0	-113,317	-38,527,893	3,211	0	100	0
0	0	0	-112,651	-25,797,003	2,150	0	100	0
0	0	0	-111,984	-14,893,872	1,241	0	100	0
0	0	0	-111,317	-6,345,088	529	0	100	0
0	0	0	-110,651	-2,434,315	203	0	100	0
0	0	0	-109,984	-989,856	82	0	100	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
	0	0		-1,025,087,221	85,424		875,700	0

System Summary		
Existing System	Usage	Gas
	kWh	Therms
Heating		0
Cooling	85,424	
Vent Cooling	0	
Lighting	8,760	
Equipment	219,000	
Total	313,184	0

Proposed Building Envelope	
Wall Area	200 sqft
Wall Conductivity	0.3 u Value
Window Area	40 sqft
Window Conductivity	1 u Value
Roof Area	0 sqft
Roof Conductivity	0.35 u Value
Floor Area	1000 sqft
Volume	8000 cuft

Set Points	
Heating Set Point	0 deg F
Cooling Set Point	70 deg F

Internal Loads	
Lighting Density	1.00 w/sqft
Equipment Density	25.00 w/sqft
Occupancy	2 people
Occupant Sensible Load	250 btu/person
Infiltration	0.0 cfm
Exhaust	0 cfm

Building Equipment	
Heating System	256,000 Btuh
Heating Efficiency	81.5 %
Cooling System	100000 Btuh
Cooling Efficiency	12.0 EER
Vent Cooling	0 CFM
Vent Power	0 kW

Proposed Load Summaries							
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load
deg F	Hours		*	btuh	btuh	btuh	btuh
102.5	2	0	1	-3,250	-89,238	0	-92,488
97.5	23	0	1	-2,750	-89,238	0	-91,988
92.5	93	0	1	-2,250	-89,238	0	-91,488
87.5	237	0	1	-1,750	-89,238	0	-90,988
82.5	452	0	1	-1,250	-89,238	0	-90,488
77.5	692	0	1	-750	-89,238	0	-89,988
72.5	858	0	1	-250	-89,238	0	-89,488
67.5	753	0	1	250	-89,238	0	-88,988
62.5	735	0	1	750	-89,238	0	-88,488
57.5	671	0	1	1,250	-89,238	0	-87,988
52.5	736	0	1	1,750	-89,238	0	-87,488
47.5	708	0	1	2,250	-89,238	0	-86,988
42.5	756	0	1	2,750	-89,238	0	-86,488
37.5	705	0	1	3,250	-89,238	0	-85,988
32.5	546	0	1	3,750	-89,238	0	-85,488
27.5	340	0	1	4,250	-89,238	0	-84,988
22.5	229	0	1	4,750	-89,238	0	-84,488
17.5	133	0	1	5,250	-89,238	0	-83,988
12.5	57	0	1	5,750	-89,238	0	-83,488
7.5	22	0	1	6,250	-89,238	0	-82,988
2.5	9	0	1	6,750	-89,238	0	-82,488
-2.5	2	1	0	250	-89,238	0	0
-7.5	1	1	0	750	-89,238	0	0
Total	8,760	3	8,757				

Proposed Heating System			Proposed Cooling System			Proposed Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	-92,488	-184,976	15	0	100	0
0	0	0	-91,988	-2,115,724	176	0	100	0
0	0	0	-91,488	-8,508,384	709	0	100	0
0	0	0	-90,988	-21,564,156	1,797	0	100	0
0	0	0	-90,488	-40,900,576	3,408	0	100	0
0	0	0	-89,988	-62,271,696	5,189	0	100	0
0	0	0	-89,488	-76,780,704	6,398	0	100	0
0	0	0	-88,988	-67,007,964	5,584	0	100	0
0	0	0	-88,488	-65,038,680	5,420	0	100	0
0	0	0	-87,988	-59,039,948	4,920	0	100	0
0	0	0	-87,488	-64,391,168	5,366	0	100	0
0	0	0	-86,988	-61,587,504	5,132	0	100	0
0	0	0	-86,488	-65,384,928	5,449	0	100	0
0	0	0	-85,988	-60,621,540	5,052	0	100	0
0	0	0	-85,488	-46,676,448	3,890	0	100	0
0	0	0	-84,988	-28,895,920	2,408	0	100	0
0	0	0	-84,488	-19,347,752	1,612	0	100	0
0	0	0	-83,988	-11,170,404	931	0	100	0
0	0	0	-83,488	-4,758,816	397	0	100	0
0	0	0	-82,988	-1,825,736	152	0	100	0
0	0	0	-82,488	-742,392	62	0	100	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
	0	0		-768,815,416	64,068		875,700	0

System Summary	
Proposed System	Usage kWh
Heating	0
Cooling	64,068
Vent Cooling	0
Lighting	8,760
Equipment	219,000
Total	291,828

Estimated Savings
21,356 kWh

Notes:

- Negative Numbers indicate heat needs to be removed from the space
- Heating and Cooling columns determine if the building should be heating or cooling
- Vent Power is the ventilation fan motor horse power.

Energy Audit Department	
Energy Audit Building	City Hall Annex

Existing Building Envelope		
Wall Area	2484	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	2250	sqft
Roof Conductivity	0.35	u Value
Floor Area	2250	sqft
Volume	27000	cuft

Set Points		
Heating Set Point	50	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	0.32	w/sqft
Occupancy	2	people
Occupant Sensible Load	250	btu/person
Infiltration	1,350.0	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	256,000	Btuh
Heating Efficiency	81.5	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	2,500	CFM
Vent Power	0.2	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-34,486	-3,725	-32,805	-71,016	
97.5	23	0	1	-26,822	-3,725	-25,515	-56,063	
92.5	93	0	1	-19,159	-3,725	-18,225	-41,109	
87.5	237	0	1	-11,495	-3,725	-10,935	-26,156	
82.5	452	0	1	-3,832	-3,725	-3,645	-11,202	
77.5	692	0	1	3,832	-3,725	3,645	0	
72.5	858	0	1	11,495	-3,725	10,935	0	
67.5	753	0	1	19,159	-3,725	18,225	0	
62.5	735	0	1	26,822	-3,725	25,515	0	
57.5	671	0	1	34,486	-3,725	32,805	0	
52.5	736	0	1	42,149	-3,725	40,095	0	
47.5	708	1	0	3,832	-3,725	3,645	3,751	
42.5	756	1	0	11,495	-3,725	10,935	18,705	
37.5	705	1	0	19,159	-3,725	18,225	33,658	
32.5	546	1	0	26,822	-3,725	25,515	48,612	
27.5	340	1	0	34,486	-3,725	32,805	63,565	
22.5	229	1	0	42,149	-3,725	40,095	78,519	
17.5	133	1	0	49,813	-3,725	47,385	93,472	
12.5	57	1	0	57,476	-3,725	54,675	108,426	
7.5	22	1	0	65,140	-3,725	61,965	123,379	
2.5	9	1	0	72,803	-3,725	69,255	138,333	
-2.5	2	1	0	80,467	-3,725	76,545	153,286	
-7.5	1	1	0	88,130	-3,725	83,835	168,240	
Total	8,760	3,508	5,252					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-60,750	100	0
0	0	0	0	0	0	-47,250	100	5
0	0	0	0	0	0	-33,750	100	19
0	0	0	0	0	0	-20,250	100	47
0	0	0	0	0	0	-6,750	100	90
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
4,603	3,258,941	955	0	0	0	0	0	0
22,951	17,350,863	5,084	0	0	0	0	0	0
41,299	29,115,605	8,531	0	0	0	0	0	0
59,647	32,567,034	9,542	0	0	0	0	0	0
77,994	26,518,108	7,770	0	0	0	0	0	0
96,342	22,062,384	6,464	0	0	0	0	0	0
114,690	15,253,789	4,469	0	0	0	0	0	0
133,038	7,583,166	2,222	0	0	0	0	0	0
151,386	3,330,489	976	0	0	0	0	0	0
169,734	1,527,603	448	0	0	0	0	0	0
188,082	376,163	110	0	0	0	0	0	0
206,429	206,429	60	0	0	0	0	0	0
	159,150,575	46,631		0	0		80,700	161

System Summary		
Existing System	Usage	Gas
	kWh	Therms
Heating		1592
Cooling	0	
Vent Cooling	161	
Lighting	1,971	
Equipment	6,307	
Total	8,440	1592

Energy Audit Department	Water Department
Energy Audit Building	High Service Pump Station

Existing Building Envelope		
Wall Area	1020	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	650	sqft
Roof Conductivity	0.3	u Value
Floor Area	650	sqft
Volume	6500	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	5.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	54.2	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	210,000	Btuh
Heating Efficiency	74	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	2,300	CFM
Vent Power	0.2	kW

Existing Load Summaries							
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load
deg F	Hours			btuh	btuh	btuh	btuh
102.5	2	0	1	-11,273	-11,314	-1,316	-23,903
97.5	23	0	1	-8,768	-11,314	-1,024	-21,105
92.5	93	0	1	-6,263	-11,314	-731	-18,308
87.5	237	0	1	-3,758	-11,314	-439	-15,510
82.5	452	0	1	-1,253	-11,314	-146	-12,713
77.5	692	0	1	1,253	-11,314	146	-9,915
72.5	858	0	1	3,758	-11,314	439	-7,118
67.5	753	0	1	6,263	-11,314	731	-4,320
62.5	735	1	0	1,253	-11,314	146	0
57.5	671	1	0	3,758	-11,314	439	0
52.5	736	1	0	6,263	-11,314	731	0
47.5	708	1	0	8,768	-11,314	1,024	0
42.5	756	1	0	11,273	-11,314	1,316	1,275
37.5	705	1	0	13,778	-11,314	1,609	4,072
32.5	546	1	0	16,283	-11,314	1,901	6,870
27.5	340	1	0	18,788	-11,314	2,194	9,667
22.5	229	1	0	21,293	-11,314	2,486	12,465
17.5	133	1	0	23,798	-11,314	2,779	15,262
12.5	57	1	0	26,303	-11,314	3,071	18,060
7.5	22	1	0	28,808	-11,314	3,364	20,857
2.5	9	1	0	31,313	-11,314	3,656	23,655
-2.5	2	1	0	33,818	-11,314	3,949	26,452
-7.5	1	1	0	36,323	-11,314	4,241	29,250
Total	8,760	5,650	3,110				

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-55,890	100	0
0	0	0	0	0	0	-43,470	100	5
0	0	0	0	0	0	-31,050	100	19
0	0	0	0	0	0	-18,630	100	47
0	0	0	0	0	0	-6,210	100	90
0	0	0	0	0	0	6,210	100	138
0	0	0	0	0	0	18,630	38	66
0	0	0	0	0	0	31,050	14	21
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
1,723	1,302,215	382	0	0	0	0	0	0
5,503	3,879,553	1,137	0	0	0	0	0	0
9,283	5,068,691	1,485	0	0	0	0	0	0
13,064	4,441,666	1,301	0	0	0	0	0	0
16,844	3,857,305	1,130	0	0	0	0	0	0
20,625	2,743,063	804	0	0	0	0	0	0
24,405	1,391,082	408	0	0	0	0	0	0
28,185	620,078	182	0	0	0	0	0	0
31,966	287,692	84	0	0	0	0	0	0
35,746	71,492	21	0	0	0	0	0	0
39,527	39,527	12	0	0	0	0	0	0
	23,702,364			0	0		193,158	386

System Summary		
Existing System	Usage	Oil
	kWh	Gallons
Heating		169.2414
Cooling	0	
Vent Cooling	386	
Lighting	569	
Equipment	28,470	
Total	29,426	169

Energy Audit Department	Water Department
Energy Audit Building	#1 Well House

Existing Building Envelope		
Wall Area	840	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	300	sqft
Roof Conductivity	0.1	u Value
Floor Area	300	sqft
Volume	3600	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	7.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	30.0	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	34,130	Btuh
Heating Efficiency	100	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	500	CFM
Vent Power	0.3	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-6,345	-7,270	-729	-14,344	
97.5	23	0	1	-4,935	-7,270	-567	-12,772	
92.5	93	0	1	-3,525	-7,270	-405	-11,200	
87.5	237	0	1	-2,115	-7,270	-243	-9,628	
82.5	452	0	1	-705	-7,270	-81	-8,056	
77.5	692	0	1	705	-7,270	81	-6,484	
72.5	858	0	1	2,115	-7,270	243	-4,912	
67.5	753	0	1	3,525	-7,270	405	-3,340	
62.5	735	1	0	705	-7,270	81	0	
57.5	671	1	0	2,115	-7,270	243	0	
52.5	736	1	0	3,525	-7,270	405	0	
47.5	708	1	0	4,935	-7,270	567	0	
42.5	756	1	0	6,345	-7,270	729	0	
37.5	705	1	0	7,755	-7,270	891	1,376	
32.5	546	1	0	9,165	-7,270	1,053	2,948	
27.5	340	1	0	10,575	-7,270	1,215	4,520	
22.5	229	1	0	11,985	-7,270	1,377	6,092	
17.5	133	1	0	13,395	-7,270	1,539	7,664	
12.5	57	1	0	14,805	-7,270	1,701	9,236	
7.5	22	1	0	16,215	-7,270	1,863	10,808	
2.5	9	1	0	17,625	-7,270	2,025	12,380	
-2.5	2	1	0	19,035	-7,270	2,187	13,952	
-7.5	1	1	0	20,445	-7,270	2,349	15,524	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-12,150	100	1
0	0	0	0	0	0	-9,450	100	7
0	0	0	0	0	0	-6,750	100	28
0	0	0	0	0	0	-4,050	100	71
0	0	0	0	0	0	-1,350	100	136
0	0	0	0	0	0	1,350	100	208
0	0	0	0	0	0	4,050	100	257
0	0	0	0	0	0	6,750	49	112
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
1,376	970,299	284	0	0	0	0	0	0
2,948	1,609,777	472	0	0	0	0	0	0
4,520	1,536,905	450	0	0	0	0	0	0
6,092	1,395,139	409	0	0	0	0	0	0
7,664	1,019,353	299	0	0	0	0	0	0
9,236	526,470	154	0	0	0	0	0	0
10,808	237,783	70	0	0	0	0	0	0
12,380	111,423	33	0	0	0	0	0	0
13,952	27,905	8	0	0	0	0	0	0
15,524	15,524	5	0	0	0	0	0	0
	7,450,578	2,183		0	0		272,956	819

System Summary	
Existing System	Usage kWh
Heating	2,183
Cooling	0
Vent Cooling	819
Lighting	263
Equipment	18,396
Total	21,661

Energy Audit Department	Water Department
Energy Audit Building	#2 Well House

Existing Building Envelope		
Wall Area	840	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	300	sqft
Roof Conductivity	0.1	u Value
Floor Area	300	sqft
Volume	3600	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.15	w/sqft
Equipment Density	9.20	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	30.0	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	51,195	Btuh
Heating Efficiency	100	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	500	CFM
Vent Power	0.3	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-6,345	-9,573	-729	-16,647	
97.5	23	0	1	-4,935	-9,573	-567	-15,075	
92.5	93	0	1	-3,525	-9,573	-405	-13,503	
87.5	237	0	1	-2,115	-9,573	-243	-11,931	
82.5	452	0	1	-705	-9,573	-81	-10,359	
77.5	692	0	1	705	-9,573	81	-8,787	
72.5	858	0	1	2,115	-9,573	243	-7,215	
67.5	753	0	1	3,525	-9,573	405	-5,643	
62.5	735	1	0	705	-9,573	81	0	
57.5	671	1	0	2,115	-9,573	243	0	
52.5	736	1	0	3,525	-9,573	405	0	
47.5	708	1	0	4,935	-9,573	567	0	
42.5	756	1	0	6,345	-9,573	729	0	
37.5	705	1	0	7,755	-9,573	891	0	
32.5	546	1	0	9,165	-9,573	1,053	645	
27.5	340	1	0	10,575	-9,573	1,215	2,217	
22.5	229	1	0	11,985	-9,573	1,377	3,789	
17.5	133	1	0	13,395	-9,573	1,539	5,361	
12.5	57	1	0	14,805	-9,573	1,701	6,933	
7.5	22	1	0	16,215	-9,573	1,863	8,505	
2.5	9	1	0	17,625	-9,573	2,025	10,077	
-2.5	2	1	0	19,035	-9,573	2,187	11,649	
-7.5	1	1	0	20,445	-9,573	2,349	13,221	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-12,150	100	1
0	0	0	0	0	0	-9,450	100	7
0	0	0	0	0	0	-6,750	100	28
0	0	0	0	0	0	-4,050	100	71
0	0	0	0	0	0	-1,350	100	136
0	0	0	0	0	0	1,350	100	208
0	0	0	0	0	0	4,050	100	257
0	0	0	0	0	0	6,750	84	189
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
645	351,916	103	0	0	0	0	0	0
2,217	753,622	221	0	0	0	0	0	0
3,789	867,575	254	0	0	0	0	0	0
5,361	712,951	209	0	0	0	0	0	0
6,933	395,154	116	0	0	0	0	0	0
8,505	187,100	55	0	0	0	0	0	0
10,077	90,689	27	0	0	0	0	0	0
11,649	23,297	7	0	0	0	0	0	0
13,221	13,221	4	0	0	0	0	0	0
	3,395,524	995		0	0		298,656	896

System Summary	
Existing System	Usage kWh
Heating	995
Cooling	0
Vent Cooling	896
Lighting	394
Equipment	24,178
Total	26,463

Energy Audit Department	Water Department
Energy Audit Building	Chemical Control Building

Existing Building Envelope		
Wall Area	1440	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	913	sqft
Roof Conductivity	0.1	u Value
Floor Area	913	sqft
Volume	10956	cuft

Set Points		
Heating Set Point	45	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	0.20	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	91.3	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	17,065	Btuh
Heating Efficiency	100	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	500	CFM
Vent Power	0.3	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-11,774	-935	-2,219	-14,928	
97.5	23	0	1	-9,158	-935	-1,726	-11,818	
92.5	93	0	1	-6,541	-935	-1,233	-8,709	
87.5	237	0	1	-3,925	-935	-740	-5,599	
82.5	452	0	1	-1,308	-935	-247	-2,490	
77.5	692	0	1	1,308	-935	247	0	
72.5	858	0	1	3,925	-935	740	0	
67.5	753	0	1	6,541	-935	1,233	0	
62.5	735	0	1	9,158	-935	1,726	0	
57.5	671	0	1	11,774	-935	2,219	0	
52.5	736	0	1	14,391	-935	2,712	0	
47.5	708	0	1	17,007	-935	3,205	0	
42.5	756	1	0	1,308	-935	247	620	
37.5	705	1	0	3,925	-935	740	3,729	
32.5	546	1	0	6,541	-935	1,233	6,839	
27.5	340	1	0	9,158	-935	1,726	9,948	
22.5	229	1	0	11,774	-935	2,219	13,058	
17.5	133	1	0	14,391	-935	2,712	16,168	
12.5	57	1	0	17,007	-935	3,205	19,277	
7.5	22	1	0	19,624	-935	3,698	22,387	
2.5	9	1	0	22,240	-935	4,191	25,496	
-2.5	2	1	0	24,857	-935	4,684	28,606	
-7.5	1	1	0	27,473	-935	5,177	31,715	
Total	8,760	2,800	5,960					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-12,150	100	1
0	0	0	0	0	0	-9,450	100	7
0	0	0	0	0	0	-6,750	100	28
0	0	0	0	0	0	-4,050	100	71
0	0	0	0	0	0	-1,350	100	136
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
620	468,674	137	0	0	0	0	0	0
3,729	2,629,269	770	0	0	0	0	0	0
6,839	3,734,083	1,094	0	0	0	0	0	0
9,948	3,382,490	991	0	0	0	0	0	0
13,058	2,990,286	876	0	0	0	0	0	0
16,168	2,150,283	630	0	0	0	0	0	0
17,065	972,705	285	0	0	0	0	0	0
17,065	375,430	110	0	0	0	0	0	0
17,065	153,585	45	0	0	0	0	0	0
17,065	34,130	10	0	0	0	0	0	0
17,065	17,065	5	0	0	0	0	0	0
	16,908,000	4,954		0	0		80,700	242

System Summary	
Existing System	Usage kWh
Heating	4,954
Cooling	0
Vent Cooling	242
Lighting	800
Equipment	1,600
Total	7,595

Energy Audit Department	Water Department
Energy Audit Building	Pump & Control & Generator Building Hill Street

Existing Building Envelope		
Wall Area	1704	sqft
Wall Conductivity	0.5	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	1266	sqft
Roof Conductivity	0.3	u Value
Floor Area	1266	sqft
Volume	15192	cuft

Set Points		
Heating Set Point	63	deg F
Cooling Set Point	70	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	9.10	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	253.2	cfm
Exhaust	1500	cfm

Building Equipment		
Heating System	150,000	Btuh
Heating Efficiency	70	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	4,000	CFM
Vent Power	1	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-40,034	-39,752	-61,537	-141,323	
97.5	23	0	1	-33,875	-39,752	-52,070	-125,696	
92.5	93	0	1	-27,716	-39,752	-42,603	-110,070	
87.5	237	0	1	-21,557	-39,752	-33,135	-94,444	
82.5	452	0	1	-15,398	-39,752	-23,668	-78,818	
77.5	692	0	1	-9,239	-39,752	-14,201	-63,191	
72.5	858	0	1	-3,080	-39,752	-4,734	-47,565	
67.5	753	0	1	3,080	-39,752	4,734	-31,939	
62.5	735	1	0	616	-39,752	947	0	
57.5	671	1	0	6,775	-39,752	10,414	0	
52.5	736	1	0	12,934	-39,752	19,881	0	
47.5	708	1	0	19,093	-39,752	29,349	8,690	
42.5	756	1	0	25,252	-39,752	38,816	24,316	
37.5	705	1	0	31,411	-39,752	48,283	39,942	
32.5	546	1	0	37,570	-39,752	57,750	55,568	
27.5	340	1	0	43,729	-39,752	67,218	71,195	
22.5	229	1	0	49,888	-39,752	76,685	86,821	
17.5	133	1	0	56,047	-39,752	86,152	102,447	
12.5	57	1	0	62,206	-39,752	95,620	118,074	
7.5	22	1	0	68,365	-39,752	105,087	133,700	
2.5	9	1	0	74,524	-39,752	114,554	149,326	
-2.5	2	1	0	80,683	-39,752	124,021	164,952	
-7.5	1	1	0	86,842	-39,752	133,489	180,579	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-140,400	100	2
0	0	0	0	0	0	-118,800	100	23
0	0	0	0	0	0	-97,200	100	93
0	0	0	0	0	0	-75,600	100	237
0	0	0	0	0	0	-54,000	100	452
0	0	0	0	0	0	-32,400	100	692
0	0	0	0	0	0	-10,800	100	858
0	0	0	0	0	0	10,800	100	753
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
12,414	8,788,884	2,575	0	0	0	0	0	0
34,737	26,261,123	7,694	0	0	0	0	0	0
57,060	40,227,435	11,787	0	0	0	0	0	0
79,383	43,343,363	12,699	0	0	0	0	0	0
101,707	34,580,280	10,132	0	0	0	0	0	0
124,030	28,402,862	8,322	0	0	0	0	0	0
146,353	19,464,978	5,703	0	0	0	0	0	0
168,676	9,614,559	2,817	0	0	0	0	0	0
191,000	4,201,994	1,231	0	0	0	0	0	0
213,323	1,919,907	563	0	0	0	0	0	0
214,286	428,571	126	0	0	0	0	0	0
214,286	214,286	63	0	0	0	0	0	0
	217,448,243	63,712		0	0		311,000	3,110

System Summary		
Existing System	Usage	Oil
	kWh	Gallons
Heating		1564.376
Cooling	0	
Vent Cooling	3,110	
Lighting	1,109	
Equipment	100,920	
Total	105,139	1,564

Energy Audit Department	Water Department
Energy Audit Building	Pump & Control Building Wolcott Street

Existing Building Envelope		
Wall Area	1188	sqft
Wall Conductivity	0.25	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	609	sqft
Roof Conductivity	0.3	u Value
Floor Area	609	sqft
Volume	7308	cuft

Set Points		
Heating Set Point	60	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	3.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	60.9	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	25,598	Btuh
Heating Efficiency	100	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	500	CFM
Vent Power	0.3	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-10,793	-6,443	-1,480	-18,717	
97.5	23	0	1	-8,395	-6,443	-1,151	-15,989	
92.5	93	0	1	-5,996	-6,443	-822	-13,262	
87.5	237	0	1	-3,598	-6,443	-493	-10,534	
82.5	452	0	1	-1,199	-6,443	-164	-7,807	
77.5	692	0	1	1,199	-6,443	164	-5,080	
72.5	858	0	1	3,598	-6,443	493	-2,352	
67.5	753	0	1	5,996	-6,443	822	0	
62.5	735	0	1	8,395	-6,443	1,151	0	
57.5	671	1	0	1,199	-6,443	164	0	
52.5	736	1	0	3,598	-6,443	493	0	
47.5	708	1	0	5,996	-6,443	822	375	
42.5	756	1	0	8,395	-6,443	1,151	3,102	
37.5	705	1	0	10,793	-6,443	1,480	5,830	
32.5	546	1	0	13,192	-6,443	1,809	8,557	
27.5	340	1	0	15,590	-6,443	2,138	11,284	
22.5	229	1	0	17,989	-6,443	2,466	14,012	
17.5	133	1	0	20,387	-6,443	2,795	16,739	
12.5	57	1	0	22,786	-6,443	3,124	19,467	
7.5	22	1	0	25,184	-6,443	3,453	22,194	
2.5	9	1	0	27,583	-6,443	3,782	24,921	
-2.5	2	1	0	29,981	-6,443	4,111	27,649	
-7.5	1	1	0	32,380	-6,443	4,440	30,376	
Total	8,760	4,915	3,845					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-12,150	100	1
0	0	0	0	0	0	-9,450	100	7
0	0	0	0	0	0	-6,750	100	28
0	0	0	0	0	0	-4,050	100	71
0	0	0	0	0	0	-1,350	100	136
0	0	0	0	0	0	1,350	100	208
0	0	0	0	0	0	4,050	58	150
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
375	265,498	78	0	0	0	0	0	0
3,102	2,345,382	687	0	0	0	0	0	0
5,830	4,109,951	1,204	0	0	0	0	0	0
8,557	4,672,164	1,369	0	0	0	0	0	0
11,284	3,836,709	1,124	0	0	0	0	0	0
14,012	3,208,702	940	0	0	0	0	0	0
16,739	2,226,308	652	0	0	0	0	0	0
19,467	1,109,591	325	0	0	0	0	0	0
22,194	488,265	143	0	0	0	0	0	0
24,921	224,291	66	0	0	0	0	0	0
25,598	51,195	15	0	0	0	0	0	0
25,598	25,598	8	0	0	0	0	0	0
	22,563,654	6,611		0	0		199,735	599

System Summary	
Existing System	Usage kWh
Heating	6,611
Cooling	0
Vent Cooling	599
Lighting	533
Equipment	16,005
Total	23,748

Energy Audit Department	Water Department
Energy Audit Building	Pump & Control Building Peck Lane

Existing Building Envelope		
Wall Area	1416	sqft
Wall Conductivity	0.25	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	834	sqft
Roof Conductivity	0.5	u Value
Floor Area	834	sqft
Volume	10008	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	11.50	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	83.4	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	51,195	Btuh
Heating Efficiency	100	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	1,500	CFM
Vent Power	0.3	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-17,348	-33,019	-2,027	-52,393	
97.5	23	0	1	-13,493	-33,019	-1,576	-48,087	
92.5	93	0	1	-9,638	-33,019	-1,126	-43,782	
87.5	237	0	1	-5,783	-33,019	-676	-39,477	
82.5	452	0	1	-1,928	-33,019	-225	-35,171	
77.5	692	0	1	1,928	-33,019	225	-30,866	
72.5	858	0	1	5,783	-33,019	676	-26,561	
67.5	753	0	1	9,638	-33,019	1,126	-22,255	
62.5	735	1	0	1,928	-33,019	225	0	
57.5	671	1	0	5,783	-33,019	676	0	
52.5	736	1	0	9,638	-33,019	1,126	0	
47.5	708	1	0	13,493	-33,019	1,576	0	
42.5	756	1	0	17,348	-33,019	2,027	0	
37.5	705	1	0	21,203	-33,019	2,477	0	
32.5	546	1	0	25,058	-33,019	2,927	0	
27.5	340	1	0	28,913	-33,019	3,378	0	
22.5	229	1	0	32,768	-33,019	3,828	3,577	
17.5	133	1	0	36,623	-33,019	4,278	7,882	
12.5	57	1	0	40,478	-33,019	4,729	12,188	
7.5	22	1	0	44,333	-33,019	5,179	16,493	
2.5	9	1	0	48,188	-33,019	5,630	20,798	
-2.5	2	1	0	52,043	-33,019	6,080	25,104	
-7.5	1	1	0	55,898	-33,019	6,530	29,409	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-36,450	100	1
0	0	0	0	0	0	-28,350	100	7
0	0	0	0	0	0	-20,250	100	28
0	0	0	0	0	0	-12,150	100	71
0	0	0	0	0	0	-4,050	100	136
0	0	0	0	0	0	4,050	100	208
0	0	0	0	0	0	12,150	100	257
0	0	0	0	0	0	20,250	100	226
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
3,577	819,095	240	0	0	0	0	0	0
7,882	1,048,332	307	0	0	0	0	0	0
12,188	694,691	204	0	0	0	0	0	0
16,493	362,844	106	0	0	0	0	0	0
20,798	187,184	55	0	0	0	0	0	0
25,104	50,207	15	0	0	0	0	0	0
29,409	29,409	9	0	0	0	0	0	0
	3,191,762	935		0	0		311,000	933

System Summary	
Existing System	Usage kWh
Heating	935
Cooling	0
Vent Cooling	933
Lighting	731
Equipment	84,017
Total	86,616

Energy Audit Department	Parks Department
Energy Audit Building	Rockwell Pavilion

Existing Building Envelope		
Wall Area	2160	sqft
Wall Conductivity	0.2	u Value
Window Area	240	sqft
Window Conductivity	1.13	u Value
Roof Area	1500	sqft
Roof Conductivity	0.4	u Value
Floor Area	1500	sqft
Volume	22500	cuft

Set Points		
Heating Set Point	61	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	0.68	w/sqft
Occupancy	10	people
Occupant Sensible Load	250	btu/person
Infiltration	187.5	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	283,500	Btuh
Heating Efficiency	70	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	1,000	CFM
Vent Power	0.3	kW

Existing Load Summaries							
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load
deg F	Hours			btuh	btuh	btuh	btuh
102.5	2	0	1	-29,322	-6,493	-4,556	-40,371
97.5	23	0	1	-22,806	-6,493	-3,544	-32,843
92.5	93	0	1	-16,290	-6,493	-2,531	-25,314
87.5	237	0	1	-9,774	-6,493	-1,519	-17,786
82.5	452	0	1	-3,258	-6,493	-506	-10,257
77.5	692	0	1	3,258	-6,493	506	-2,729
72.5	858	0	1	9,774	-6,493	1,519	0
67.5	753	0	1	16,290	-6,493	2,531	0
62.5	735	0	1	22,806	-6,493	3,544	0
57.5	671	1	0	4,561	-6,493	709	0
52.5	736	1	0	11,077	-6,493	1,721	6,305
47.5	708	1	0	17,593	-6,493	2,734	13,834
42.5	756	1	0	24,109	-6,493	3,746	21,362
37.5	705	1	0	30,625	-6,493	4,759	28,891
32.5	546	1	0	37,141	-6,493	5,771	36,419
27.5	340	1	0	43,657	-6,493	6,784	43,948
22.5	229	1	0	50,173	-6,493	7,796	51,476
17.5	133	1	0	56,689	-6,493	8,809	59,005
12.5	57	1	0	63,205	-6,493	9,821	66,533
7.5	22	1	0	69,721	-6,493	10,834	74,062
2.5	9	1	0	76,237	-6,493	11,846	81,590
-2.5	2	1	0	82,753	-6,493	12,859	89,119
-7.5	1	1	0	89,269	-6,493	13,871	96,647
Total	8,760	4,915	3,845				

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-24,300	100	1
0	0	0	0	0	0	-18,900	100	7
0	0	0	0	0	0	-13,500	100	28
0	0	0	0	0	0	-8,100	100	71
0	0	0	0	0	0	-2,700	100	136
0	0	0	0	0	0	2,700	100	208
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
9,007	6,629,509	1,942	0	0	0	0	0	0
19,762	13,991,840	4,100	0	0	0	0	0	0
30,517	23,071,219	6,760	0	0	0	0	0	0
41,272	29,097,102	8,525	0	0	0	0	0	0
52,027	28,407,007	8,323	0	0	0	0	0	0
62,782	21,346,045	6,254	0	0	0	0	0	0
73,537	16,840,084	4,934	0	0	0	0	0	0
84,292	11,210,901	3,285	0	0	0	0	0	0
95,047	5,417,707	1,587	0	0	0	0	0	0
105,802	2,327,655	682	0	0	0	0	0	0
116,557	1,049,017	307	0	0	0	0	0	0
127,312	254,625	75	0	0	0	0	0	0
138,067	138,067	40	0	0	0	0	0	0
	159,780,779	46,815		0	0		149,900	450

System Summary		
Existing System	Usage	Gas
	kWh	Therms
Heating		1597
Cooling	0	
Vent Cooling	450	
Lighting	1,314	
Equipment	8,935	
Total	10,699	1597

Energy Audit Department	Parks Department
Energy Audit Building	Bathhouse

Existing Building Envelope		
Wall Area	2700	sqft
Wall Conductivity	0.67	u Value
Window Area	300	sqft
Window Conductivity	1.3	u Value
Roof Area	2574	sqft
Roof Conductivity	0.25	u Value
Floor Area	2574	sqft
Volume	30888	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	0.65	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	514.8	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	27,304	Btuh
Heating Efficiency	100	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	1,800	CFM
Vent Power	0.3	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-63,956	-6,589	-12,510	-83,055	
97.5	23	0	1	-49,744	-6,589	-9,730	-66,062	
92.5	93	0	1	-35,531	-6,589	-6,950	-49,070	
87.5	237	0	1	-21,319	-6,589	-4,170	-32,077	
82.5	452	0	1	-7,106	-6,589	-1,390	-15,085	
77.5	692	0	1	7,106	-6,589	1,390	0	
72.5	858	0	1	21,319	-6,589	4,170	0	
67.5	753	0	1	35,531	-6,589	6,950	0	
62.5	735	1	0	7,106	-6,589	1,390	1,907	
57.5	671	1	0	21,319	-6,589	4,170	18,900	
52.5	736	1	0	35,531	-6,589	6,950	35,892	
47.5	708	1	0	49,744	-6,589	9,730	52,885	
42.5	756	1	0	63,956	-6,589	12,510	69,877	
37.5	705	1	0	78,169	-6,589	15,290	86,870	
32.5	546	1	0	92,381	-6,589	18,069	103,862	
27.5	340	1	0	106,594	-6,589	20,849	120,854	
22.5	229	1	0	120,806	-6,589	23,629	137,847	
17.5	133	1	0	135,019	-6,589	26,409	154,839	
12.5	57	1	0	149,231	-6,589	29,189	171,832	
7.5	22	1	0	163,444	-6,589	31,969	188,824	
2.5	9	1	0	177,656	-6,589	34,749	205,816	
-2.5	2	1	0	191,869	-6,589	37,529	222,809	
-7.5	1	1	0	206,081	-6,589	40,309	239,801	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-43,740	100	1
0	0	0	0	0	0	-34,020	100	7
0	0	0	0	0	0	-24,300	100	28
0	0	0	0	0	0	-14,580	100	71
0	0	0	0	0	0	-4,860	100	136
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
1,907	1,401,949	411	0	0	0	0	0	0
18,900	12,681,788	3,716	0	0	0	0	0	0
27,304	20,095,744	5,888	0	0	0	0	0	0
27,304	19,331,232	5,664	0	0	0	0	0	0
27,304	20,641,824	6,048	0	0	0	0	0	0
27,304	19,249,320	5,640	0	0	0	0	0	0
27,304	14,907,984	4,368	0	0	0	0	0	0
27,304	9,283,360	2,720	0	0	0	0	0	0
27,304	6,252,616	1,832	0	0	0	0	0	0
27,304	3,631,432	1,064	0	0	0	0	0	0
27,304	1,556,328	456	0	0	0	0	0	0
27,304	600,688	176	0	0	0	0	0	0
27,304	245,736	72	0	0	0	0	0	0
27,304	54,608	16	0	0	0	0	0	0
27,304	27,304	8	0	0	0	0	0	0
	129,961,913	38,078		0	0		80,700	242

System Summary	
Existing System	Usage kWh
Heating	38,078
Cooling	0
Vent Cooling	242
Lighting	2,255
Equipment	14,656
Total	55,232

Energy Audit Department	Parks Department
Energy Audit Building	Ski Lodge

Existing Building Envelope		
Wall Area	960	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	400	sqft
Roof Conductivity	0.28	u Value
Floor Area	400	sqft
Volume	4800	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	0.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	40.0	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	10,239	Btuh
Heating Efficiency	100	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	500	CFM
Vent Power	0.2	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-9,000	-137	-972	-10,109	
97.5	23	0	1	-7,000	-137	-756	-7,893	
92.5	93	0	1	-5,000	-137	-540	-5,677	
87.5	237	0	1	-3,000	-137	-324	-3,461	
82.5	452	0	1	-1,000	-137	-108	-1,245	
77.5	692	0	1	1,000	-137	108	0	
72.5	858	0	1	3,000	-137	324	0	
67.5	753	0	1	5,000	-137	540	0	
62.5	735	1	0	1,000	-137	108	971	
57.5	671	1	0	3,000	-137	324	3,187	
52.5	736	1	0	5,000	-137	540	5,403	
47.5	708	1	0	7,000	-137	756	7,619	
42.5	756	1	0	9,000	-137	972	9,835	
37.5	705	1	0	11,000	-137	1,188	12,051	
32.5	546	1	0	13,000	-137	1,404	14,267	
27.5	340	1	0	15,000	-137	1,620	16,483	
22.5	229	1	0	17,000	-137	1,836	18,699	
17.5	133	1	0	19,000	-137	2,052	20,915	
12.5	57	1	0	21,000	-137	2,268	23,131	
7.5	22	1	0	23,000	-137	2,484	25,347	
2.5	9	1	0	25,000	-137	2,700	27,563	
-2.5	2	1	0	27,000	-137	2,916	29,779	
-7.5	1	1	0	29,000	-137	3,132	31,995	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-12,150	100	0
0	0	0	0	0	0	-9,450	100	5
0	0	0	0	0	0	-6,750	100	19
0	0	0	0	0	0	-4,050	100	47
0	0	0	0	0	0	-1,350	100	90
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
971	714,038	209	0	0	0	0	0	0
3,187	2,138,799	627	0	0	0	0	0	0
5,403	3,976,961	1,165	0	0	0	0	0	0
7,619	5,394,592	1,581	0	0	0	0	0	0
9,835	7,435,623	2,179	0	0	0	0	0	0
10,239	7,218,495	2,115	0	0	0	0	0	0
10,239	5,590,494	1,638	0	0	0	0	0	0
10,239	3,481,260	1,020	0	0	0	0	0	0
10,239	2,344,731	687	0	0	0	0	0	0
10,239	1,361,787	399	0	0	0	0	0	0
10,239	583,623	171	0	0	0	0	0	0
10,239	225,258	66	0	0	0	0	0	0
10,239	92,151	27	0	0	0	0	0	0
10,239	20,478	6	0	0	0	0	0	0
10,239	10,239	3	0	0	0	0	0	0
	40,588,529	11,892		0	0		80,700	161

System Summary	
Existing System	Usage kWh
Heating	11,892
Cooling	0
Vent Cooling	161
Lighting	350
Equipment	0
Total	12,404

Energy Audit Department	Parks Department
Energy Audit Building	Page Park Pavilion

Existing Building Envelope		
Wall Area	1250	sqft
Wall Conductivity	0.3	u Value
Window Area	750	sqft
Window Conductivity	1.13	u Value
Roof Area	4354	sqft
Roof Conductivity	0.3	u Value
Floor Area	2942	sqft
Volume	47072	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	0.03	w/sqft
Occupancy	10	people
Occupant Sensible Load	250	btu/person
Infiltration	392.3	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	825,000	Btuh
Heating Efficiency	70	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	2,700	CFM
Vent Power	0.3	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-56,896	-3,805	-9,532	-70,233	
97.5	23	0	1	-44,252	-3,805	-7,414	-55,471	
92.5	93	0	1	-31,609	-3,805	-5,296	-40,710	
87.5	237	0	1	-18,965	-3,805	-3,177	-25,948	
82.5	452	0	1	-6,322	-3,805	-1,059	-11,186	
77.5	692	0	1	6,322	-3,805	1,059	0	
72.5	858	0	1	18,965	-3,805	3,177	0	
67.5	753	0	1	31,609	-3,805	5,296	0	
62.5	735	1	0	6,322	-3,805	1,059	3,576	
57.5	671	1	0	18,965	-3,805	3,177	18,337	
52.5	736	1	0	31,609	-3,805	5,296	33,099	
47.5	708	1	0	44,252	-3,805	7,414	47,861	
42.5	756	1	0	56,896	-3,805	9,532	62,622	
37.5	705	1	0	69,539	-3,805	11,650	77,384	
32.5	546	1	0	82,183	-3,805	13,769	92,146	
27.5	340	1	0	94,826	-3,805	15,887	106,908	
22.5	229	1	0	107,470	-3,805	18,005	121,669	
17.5	133	1	0	120,113	-3,805	20,123	136,431	
12.5	57	1	0	132,757	-3,805	22,242	151,193	
7.5	22	1	0	145,400	-3,805	24,360	165,955	
2.5	9	1	0	158,044	-3,805	26,478	180,716	
-2.5	2	1	0	170,687	-3,805	28,596	195,478	
-7.5	1	1	0	183,331	-3,805	30,714	210,240	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-65,610	100	1
0	0	0	0	0	0	-51,030	100	7
0	0	0	0	0	0	-36,450	100	28
0	0	0	0	0	0	-21,870	100	71
0	0	0	0	0	0	-7,290	100	136
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
5,108	3,754,311	1,100	0	0	0	0	0	0
26,196	17,577,587	5,150	0	0	0	0	0	0
47,284	34,801,249	10,197	0	0	0	0	0	0
68,373	48,407,734	14,183	0	0	0	0	0	0
89,461	67,632,294	19,816	0	0	0	0	0	0
110,549	77,936,979	22,835	0	0	0	0	0	0
131,637	71,873,860	21,059	0	0	0	0	0	0
152,725	51,926,604	15,214	0	0	0	0	0	0
173,814	39,803,293	11,662	0	0	0	0	0	0
194,902	25,921,927	7,595	0	0	0	0	0	0
215,990	12,311,425	3,607	0	0	0	0	0	0
237,078	5,215,718	1,528	0	0	0	0	0	0
258,166	2,323,497	681	0	0	0	0	0	0
279,255	558,509	164	0	0	0	0	0	0
300,343	300,343	88	0	0	0	0	0	0
	460,345,328	134,880		0	0		80,700	242

System Summary		
Existing System	Usage	Oil
	kWh	Gallons
Heating		3287
Cooling	0	
Vent Cooling	242	
Lighting	2,577	
Equipment	773	
Total	3,592	3287

Energy Audit Department	Parks Department
Energy Audit Building	Recreation Building

Existing Building Envelope	
Wall Area	2484sqft
Wall Conductivity	0.3u Value
Window Area	0sqft
Window Conductivity	1u Value
Roof Area	2670sqft
Roof Conductivity	0.25u Value
Floor Area	2670sqft
Volume	32040cuft

Set Points		
Heating Set Point	50	deg F
Cooling Set Point	80	deg F

Internal Loads	
Lighting Density	0.03w/sqft
Equipment Density	0.00w/sqft
Occupancy	0people
Occupant Sensible Load	250btu/person
Infiltration	267.0cfm
Exhaust	0cfm

Building Equipment	
Heating System	60,000Btuh
Heating Efficiency	75%
Cooling System	0Btuh
Cooling Efficiency	12.0EER
Vent Cooling	0CFM
Vent Power	0kW

Existing Load Summaries							
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load
deg F	Hours			btuh	btuh	btuh	btuh
102.5	2	0	1	-31,786	-228	-6,488	-38,502
97.5	23	0	1	-24,722	-228	-5,046	-29,996
92.5	93	0	1	-17,659	-228	-3,605	-21,491
87.5	237	0	1	-10,595	-228	-2,163	-12,986
82.5	452	0	1	-3,532	-228	-721	-4,480
77.5	692	0	1	3,532	-228	721	0
72.5	858	0	1	10,595	-228	2,163	0
67.5	753	0	1	17,659	-228	3,605	0
62.5	735	0	1	24,722	-228	5,046	0
57.5	671	0	1	31,786	-228	6,488	0
52.5	736	0	1	38,849	-228	7,930	0
47.5	708	1	0	3,532	-228	721	4,025
42.5	756	1	0	10,595	-228	2,163	12,530
37.5	705	1	0	17,659	-228	3,605	21,035
32.5	546	1	0	24,722	-228	5,046	29,541
27.5	340	1	0	31,786	-228	6,488	38,046
22.5	229	1	0	38,849	-228	7,930	46,551
17.5	133	1	0	45,913	-228	9,372	55,057
12.5	57	1	0	52,976	-228	10,814	63,562
7.5	22	1	0	60,040	-228	12,255	72,067
2.5	9	1	0	67,103	-228	13,697	80,573
-2.5	2	1	0	74,167	-228	15,139	89,078
-7.5	1	1	0	81,230	-228	16,581	97,583
Total	8,760	3,508	5,252				

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	Therms	Btuh	Btu	kWh	Btuh	%	kWh
1,067	2,133	0	0	0	0	0	100	0
1,067	24,533	0	0	0	0	0	100	0
1,067	99,200	1	0	0	0	0	100	0
1,067	252,800	3	0	0	0	0	100	0
1,067	482,133	5	0	0	0	0	100	0
1,067	738,133	7	0	0	0	0	0	0
1,067	915,200	9	0	0	0	0	0	0
1,067	803,200	8	0	0	0	0	0	0
1,067	784,000	8	0	0	0	0	0	0
1,067	715,733	7	0	0	0	0	0	0
1,067	785,067	8	0	0	0	0	0	0
5,366	3,799,442	38	0	0	0	0	0	0
16,707	12,630,373	126	0	0	0	0	0	0
28,047	19,773,306	198	0	0	0	0	0	0
39,388	21,505,653	215	0	0	0	0	0	0
50,728	17,247,535	172	0	0	0	0	0	0
62,068	14,213,673	142	0	0	0	0	0	0
73,409	9,763,376	98	0	0	0	0	0	0
80,000	4,560,000	46	0	0	0	0	0	0
80,000	1,760,000	18	0	0	0	0	0	0
80,000	720,000	7	0	0	0	0	0	0
80,000	160,000	2	0	0	0	0	0	0
80,000	80,000	1	0	0	0	0	0	0
	111,815,492	1,118		0	0		80,700	0

System Summary		
Existing System	Usage	Gas
	kWh	Therms
Heating		1118
Cooling	0	
Vent Cooling	0	
Lighting	585	
Equipment	0	
Total	585	1118

Proposed Building Envelope	
Wall Area	2484sqft
Wall Conductivity	0.3u Value
Window Area	0sqft
Window Conductivity	1u Value
Roof Area	2670sqft
Roof Conductivity	0.25u Value
Floor Area	2670sqft
Volume	32040cuft

Set Points		
Heating Set Point	50	deg F
Cooling Set Point	80	deg F

Internal Loads	
Lighting Density	0.03w/sqft
Equipment Density	0.00w/sqft
Occupancy	0people
Occupant Sensible Load	250btu/person
Infiltration	267.0cfm
Exhaust	0cfm

Building Equipment	
Heating System	60,000Btuh
Heating Efficiency	92%
Cooling System	0Btuh
Cooling Efficiency	12.0EER
Vent Cooling	0CFM
Vent Power	0kW

Proposed Load Summaries							
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load
deg F	Hours		*	btuh	btuh	btuh	btuh
102.5	2	0	1	-31,786	-228	-6,488	-38,502
97.5	23	0	1	-24,722	-228	-5,046	-29,996
92.5	93	0	1	-17,659	-228	-3,605	-21,491
87.5	237	0	1	-10,595	-228	-2,163	-12,986
82.5	452	0	1	-3,532	-228	-721	-4,480
77.5	692	0	1	3,532	-228	721	0
72.5	858	0	1	10,595	-228	2,163	0
67.5	753	0	1	17,659	-228	3,605	0
62.5	735	0	1	24,722	-228	5,046	0
57.5	671	0	1	31,786	-228	6,488	0
52.5	736	0	1	38,849	-228	7,930	0
47.5	708	1	0	3,532	-228	721	4,025
42.5	756	1	0	10,595	-228	2,163	12,530
37.5	705	1	0	17,659	-228	3,605	21,035
32.5	546	1	0	24,722	-228	5,046	29,541
27.5	340	1	0	31,786	-228	6,488	38,046
22.5	229	1	0	38,849	-228	7,930	46,551
17.5	133	1	0	45,913	-228	9,372	55,057
12.5	57	1	0	52,976	-228	10,814	63,562
7.5	22	1	0	60,040	-228	12,255	72,067
2.5	9	1	0	67,103	-228	13,697	80,573
-2.5	2	1	0	74,167	-228	15,139	89,078
-7.5	1	1	0	81,230	-228	16,581	97,583
Total	8,760	3,508	5,252				

Proposed Heating System			Proposed Cooling System			Proposed Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	Therms	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	0	100	0
0	0	0	0	0	0	0	100	0
0	0	0	0	0	0	0	100	0
0	0	0	0	0	0	0	100	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
4,375	3,097,371	31	0	0	0	0	0	0
13,620	10,296,500	103	0	0	0	0	0	0
22,865	16,119,543	161	0	0	0	0	0	0
32,109	17,531,782	175	0	0	0	0	0	0
41,354	14,060,490	141	0	0	0	0	0	0
50,599	11,587,234	116	0	0	0	0	0	0
59,844	7,959,274	80	0	0	0	0	0	0
65,217	3,717,391	37	0	0	0	0	0	0
65,217	1,434,783	14	0	0	0	0	0	0
65,217	586,957	6	0	0	0	0	0	0
65,217	130,435	1	0	0	0	0	0	0
65,217	65,217	1	0	0	0	0	0	0
	86,586,977	866		0	0		80,700	0

System Summary		
Proposed System	Usage	Gas
	kWh	Therms
Heating		866
Cooling	0	
Vent Cooling	0	
Lighting	585	
Equipment	0	
Total	585	866

Estimated Savings	
252	Therms

Notes:

- Negative Numbers indicate heat needs to be removed from the space
- Heating and Cooling columns determine if the building should be heating or cooling
- Vent Power is the ventilation fan motor horse power.
- Heating system output during hours that do not require heating result from standing pilot lights.

Energy Audit Department	Public Works
Energy Audit Building	Transfer Station Small

Averaged heating efficiency of 340% PTAC (Office) and 100% efficient baseboard (Scale House)

Existing Building Envelope		
Wall Area	1169	sqft
Wall Conductivity	0.25	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	435	sqft
Roof Conductivity	0.3	u Value
Floor Area	435	sqft
Volume	3915	cuft

Set Points		
Heating Set Point	75	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	3.00	w/sqft
Equipment Density	1.00	w/sqft
Occupancy	3	people
Occupant Sensible Load	250	btu/person
Infiltration	65.3	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	32,700	Btuh
Heating Efficiency	293.3333	%
Cooling System	59100	Btuh
Cooling Efficiency	11.5	EER
Vent Cooling	100	CFM
Vent Power	0.2	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-9,512	-6,689	-1,586	-17,786	
97.5	23	0	1	-7,398	-6,689	-1,233	-15,320	
92.5	93	0	1	-5,284	-6,689	-881	-12,854	
87.5	237	0	1	-3,171	-6,689	-529	-10,388	
82.5	452	0	1	-1,057	-6,689	-176	-7,922	
77.5	692	0	1	1,057	-6,689	176	-5,456	
72.5	858	1	0	1,057	-6,689	176	0	
67.5	753	1	0	3,171	-6,689	529	0	
62.5	735	1	0	5,284	-6,689	881	0	
57.5	671	1	0	7,398	-6,689	1,233	1,943	
52.5	736	1	0	9,512	-6,689	1,586	4,409	
47.5	708	1	0	11,626	-6,689	1,938	6,875	
42.5	756	1	0	13,739	-6,689	2,290	9,341	
37.5	705	1	0	15,853	-6,689	2,643	11,807	
32.5	546	1	0	17,967	-6,689	2,995	14,273	
27.5	340	1	0	20,081	-6,689	3,347	16,739	
22.5	229	1	0	22,194	-6,689	3,700	19,205	
17.5	133	1	0	24,308	-6,689	4,052	21,672	
12.5	57	1	0	26,422	-6,689	4,404	24,138	
7.5	22	1	0	28,536	-6,689	4,757	26,604	
2.5	9	1	0	30,649	-6,689	5,109	29,070	
-2.5	2	1	0	32,763	-6,689	5,461	31,536	
-7.5	1	1	0	34,877	-6,689	5,814	34,002	
Total	8,760	7,261	1,499					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	-18,559	-37,119	3	-2,430	100	0
0	0	0	-15,986	-367,679	31	-1,890	100	5
0	0	0	-13,413	-1,247,384	104	-1,350	100	19
0	0	0	-10,839	-2,568,941	214	-810	100	47
0	0	0	-8,266	-3,736,273	311	-270	100	90
0	0	0	-5,693	-3,939,396	328	270	100	138
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
662	444,399	130	0	0	0	0	0	0
1,503	1,106,216	324	0	0	0	0	0	0
2,344	1,659,358	486	0	0	0	0	0	0
3,184	2,407,438	705	0	0	0	0	0	0
4,025	2,837,736	831	0	0	0	0	0	0
4,866	2,656,767	778	0	0	0	0	0	0
5,707	1,940,241	568	0	0	0	0	0	0
6,547	1,499,333	439	0	0	0	0	0	0
7,388	982,607	288	0	0	0	0	0	0
8,229	469,038	137	0	0	0	0	0	0
9,069	199,528	58	0	0	0	0	0	0
9,910	89,192	26	0	0	0	0	0	0
10,751	21,502	6	0	0	0	0	0	0
11,148	11,148	3	0	0	0	0	0	0
	16,324,502	4,783		-11,896,792	991		149,900	300

System Summary	
Existing System	Usage kWh
Heating	4,783
Cooling	991
Vent Cooling	300
Lighting	11,432
Equipment	3,811
Total	21,317

Energy Audit Department	Public Works
Energy Audit Building	Transfer Station Hut

Existing Building Envelope		
Wall Area	4200	sqft
Wall Conductivity	0.15	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	2250	sqft
Roof Conductivity	0.64	u Value
Floor Area	2250	sqft
Volume	45000	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.15	w/sqft
Equipment Density	0.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	750.0	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	250,000	Btuh
Heating Efficiency	70	%
Cooling System	0	Btuh
Cooling Efficiency	11.5	EER
Vent Cooling	2,500	CFM
Vent Power	0.2	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-46,575	-1,152	-18,225	-65,952	
97.5	23	0	1	-36,225	-1,152	-14,175	-51,552	
92.5	93	0	1	-25,875	-1,152	-10,125	-37,152	
87.5	237	0	1	-15,525	-1,152	-6,075	-22,752	
82.5	452	0	1	-5,175	-1,152	-2,025	-8,352	
77.5	692	0	1	5,175	-1,152	2,025	0	
72.5	858	0	1	15,525	-1,152	6,075	0	
67.5	753	0	1	25,875	-1,152	10,125	0	
62.5	735	1	0	5,175	-1,152	2,025	6,048	
57.5	671	1	0	15,525	-1,152	6,075	20,448	
52.5	736	1	0	25,875	-1,152	10,125	34,848	
47.5	708	1	0	36,225	-1,152	14,175	49,248	
42.5	756	1	0	46,575	-1,152	18,225	63,648	
37.5	705	1	0	56,925	-1,152	22,275	78,048	
32.5	546	1	0	67,275	-1,152	26,325	92,448	
27.5	340	1	0	77,625	-1,152	30,375	106,848	
22.5	229	1	0	87,975	-1,152	34,425	121,248	
17.5	133	1	0	98,325	-1,152	38,475	135,648	
12.5	57	1	0	108,675	-1,152	42,525	150,048	
7.5	22	1	0	119,025	-1,152	46,575	164,448	
2.5	9	1	0	129,375	-1,152	50,625	178,848	
-2.5	2	1	0	139,725	-1,152	54,675	193,248	
-7.5	1	1	0	150,075	-1,152	58,725	207,648	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-60,750	100	0
0	0	0	0	0	0	-47,250	100	5
0	0	0	0	0	0	-33,750	100	19
0	0	0	0	0	0	-20,250	100	47
0	0	0	0	0	0	-6,750	100	90
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
8,640	6,350,518	1,861	0	0	0	0	0	0
29,212	19,600,976	5,743	0	0	0	0	0	0
49,783	36,640,301	10,736	0	0	0	0	0	0
70,354	49,810,948	14,594	0	0	0	0	0	0
90,926	68,739,962	20,141	0	0	0	0	0	0
111,497	78,605,599	23,031	0	0	0	0	0	0
132,069	72,109,528	21,128	0	0	0	0	0	0
152,640	51,897,655	15,206	0	0	0	0	0	0
173,212	39,665,454	11,622	0	0	0	0	0	0
193,783	25,773,141	7,551	0	0	0	0	0	0
214,354	12,218,203	3,580	0	0	0	0	0	0
234,926	5,168,369	1,514	0	0	0	0	0	0
255,497	2,299,476	674	0	0	0	0	0	0
276,069	552,137	162	0	0	0	0	0	0
296,640	296,640	87	0	0	0	0	0	0
	469,728,908	137,629		0	0		80,700	161

System Summary		
Existing System	Usage	Oil
	kWh	
Heating		4696
Cooling	0	
Vent Cooling	161	
Lighting	2,957	
Equipment	0	
Total	3,118	4,696

Energy Audit Department	Water Pollution Department
Energy Audit Building	Headworks

Existing Building Envelope		
Wall Area	3675	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	3733	sqft
Roof Conductivity	0.3	u Value
Floor Area	3733	sqft
Volume	55995	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	90	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	2.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	5,599.5	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	360,000	Btuh
Heating Efficiency	75	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	8,000	CFM
Vent Power	0.75	kW

Headworks Process Water Heat Pump		
Proposed Building Envelope		
Wall Area	3675	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	3733	sqft
Roof Conductivity	0.3	u Value
Floor Area	3733	sqft
Volume	55995	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	90	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	2.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	5,599.5	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	480,000	Btuh
Heating Efficiency	100	%
Heating COP	4.2	
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	8,000	CFM
Vent Power	0.75	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-27,780	-26,756	-75,593	-130,129	
97.5	23	0	1	-16,668	-26,756	-45,356	-88,779	
92.5	93	0	1	-5,556	-26,756	-15,119	-47,430	
87.5	237	0	1	5,556	-26,756	15,119	-6,081	
82.5	452	0	1	16,668	-26,756	45,356	0	
77.5	692	0	1	27,780	-26,756	75,593	0	
72.5	858	0	1	38,892	-26,756	105,831	0	
67.5	753	0	1	50,004	-26,756	136,068	0	
62.5	735	1	0	5,556	-26,756	15,119	0	
57.5	671	1	0	16,668	-26,756	45,356	35,268	
52.5	736	1	0	27,780	-26,756	75,593	76,618	
47.5	708	1	0	38,892	-26,756	105,831	117,967	
42.5	756	1	0	50,004	-26,756	136,068	159,316	
37.5	705	1	0	61,116	-26,756	166,305	200,666	
32.5	546	1	0	72,228	-26,756	196,542	242,015	
27.5	340	1	0	83,340	-26,756	226,780	283,364	
22.5	229	1	0	94,452	-26,756	257,017	324,714	
17.5	133	1	0	105,564	-26,756	287,254	366,063	
12.5	57	1	0	116,676	-26,756	317,492	407,412	
7.5	22	1	0	127,788	-26,756	347,729	448,761	
2.5	9	1	0	138,900	-26,756	377,966	490,111	
-2.5	2	1	0	150,012	-26,756	408,204	531,460	
-7.5	1	1	0	161,124	-26,756	438,441	572,809	
Total	8,760	5,650	3,110					

Proposed Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours		*	btuh	btuh	btuh	btuh	
102.5	2	0	1	-27,780	-26,756	-75,593	-130,129	
97.5	23	0	1	-16,668	-26,756	-45,356	-88,779	
92.5	93	0	1	-5,556	-26,756	-15,119	-47,430	
87.5	237	0	1	5,556	-26,756	15,119	-6,081	
82.5	452	0	1	16,668	-26,756	45,356	0	
77.5	692	0	1	27,780	-26,756	75,593	0	
72.5	858	0	1	38,892	-26,756	105,831	0	
67.5	753	0	1	50,004	-26,756	136,068	0	
62.5	735	1	0	5,556	-26,756	15,119	0	
57.5	671	1	0	16,668	-26,756	45,356	35,268	
52.5	736	1	0	27,780	-26,756	75,593	76,618	
47.5	708	1	0	38,892	-26,756	105,831	117,967	
42.5	756	1	0	50,004	-26,756	136,068	159,316	
37.5	705	1	0	61,116	-26,756	166,305	200,666	
32.5	546	1	0	72,228	-26,756	196,542	242,015	
27.5	340	1	0	83,340	-26,756	226,780	283,364	
22.5	229	1	0	94,452	-26,756	257,017	324,714	
17.5	133	1	0	105,564	-26,756	287,254	366,063	
12.5	57	1	0	116,676	-26,756	317,492	407,412	
7.5	22	1	0	127,788	-26,756	347,729	448,761	
2.5	9	1	0	138,900	-26,756	377,966	490,111	
-2.5	2	1	0	150,012	-26,756	408,204	531,460	
-7.5	1	1	0	161,124	-26,756	438,441	572,809	
Total	8,760	5,650	3,110					

Notes:

- Negative Numbers indicate heat needs to be removed from the space
- Heating and Cooling columns determine if the building should be heating or cooling
- Vent Power is the ventilation fan motor horse power.

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	Therms	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-108,000	100	2
0	0	0	0	0	0	-64,800	100	17
0	0	0	0	0	0	-21,600	100	70
0	0	0	0	0	0	21,600	28	50
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
47,025	31,553,479	316	0	0	0	0	0	0
102,157	75,187,522	752	0	0	0	0	0	0
157,289	111,360,866	1,114	0	0	0	0	0	0
212,422	160,590,850	1,606	0	0	0	0	0	0
267,554	188,625,682	1,886	0	0	0	0	0	0
322,687	176,186,861	1,762	0	0	0	0	0	0
377,819	128,458,446	1,285	0	0	0	0	0	0
432,951	99,145,861	991	0	0	0	0	0	0
480,000	63,840,000	638	0	0	0	0	0	0
480,000	27,360,000	274	0	0	0	0	0	0
480,000	10,560,000	106	0	0	0	0	0	0
480,000	4,320,000	43	0	0	0	0	0	0
480,000	960,000	10	0	0	0	0	0	0
480,000	480,000	5	0	0	0	0	0	0
	1,078,629,567	10,786		0	0		18,472	139

Proposed Heating System			Proposed Cooling System			Proposed Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-108,000	100	2
0	0	0	0	0	0	-64,800	100	17
0	0	0	0	0	0	-21,600	100	70
0	0	0	0	0	0	21,600	28	50
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
35,268	23,665,109	1,651	0	0	0	0	0	0
76,618	56,390,641	3,934	0	0	0	0	0	0
117,967	83,520,650	5,827	0	0	0	0	0	0
159,316	120,443,137	8,402	0	0	0	0	0	0
200,666	141,469,261	9,869	0	0	0	0	0	0
242,015	132,140,146	9,218	0	0	0	0	0	0
283,364	96,343,834	6,721	0	0	0	0	0	0
324,714	74,359,396	5,187	0	0	0	0	0	0
366,063	48,686,355	3,396	0	0	0	0	0	0
407,412	23,222,491	1,620	0	0	0	0	0	0
448,761	9,872,751	689	0	0	0	0	0	0
480,000	4,320,000	301	0	0	0	0	0	0
480,000	960,000	67	0	0	0	0	0	0
480,000	480,000	33	0	0	0	0	0	0
	815,873,772	56,916		0	0		18,472	139

System Summary		
Existing System	Usage	Gas
	kWh	Therms
Heating		10,786
Cooling	0	
Vent Cooling	139	
Lighting	3,270	
Equipment	65,402	
Total Usage	68,811	10,786
Unit Cost	\$0.154	\$1.560
Cost	\$10,597	\$16,827
Combined Cost	\$27,423	

System Summary		
Proposed System	Usage	Gas
	kWh	Therms
Heating	56,916	0
Cooling	0	
Vent Cooling	139	
Lighting	3,270	
Equipment	65,402	
Total Usage	125,727	0
Unit Cost	\$0.154	\$1.560
Cost	\$19,362	\$0
Combined Cost	\$19,362	
Estimated Savings		
-56,916 kWh		
10,786 Therms		
\$8,061 Dollars		

Energy Audit Department	Water Pollution Department
Energy Audit Building	Headworks

Existing Building Envelope		
Wall Area	3675	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	3733	sqft
Roof Conductivity	0.3	u Value
Floor Area	3733	sqft
Volume	55995	cuft

Set Points		
Heating Set Point	55	deg F
Cooling Set Point	90	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	2.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	5,599.5	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	360,000	Btuh
Heating Efficiency	75	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	8,000	CFM
Vent Power	0.75	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-27,780	-26,756	-75,593	-130,129	
97.5	23	0	1	-16,668	-26,756	-45,356	-88,779	
92.5	93	0	1	-5,556	-26,756	-15,119	-47,430	
87.5	237	0	1	5,556	-26,756	15,119	-6,081	
82.5	452	0	1	16,668	-26,756	45,356	0	
77.5	692	0	1	27,780	-26,756	75,593	0	
72.5	858	0	1	38,892	-26,756	105,831	0	
67.5	753	0	1	50,004	-26,756	136,068	0	
62.5	735	0	1	61,116	-26,756	166,305	0	
57.5	671	0	1	72,228	-26,756	196,542	0	
52.5	736	1	0	5,556	-26,756	15,119	0	
47.5	708	1	0	16,668	-26,756	45,356	35,268	
42.5	756	1	0	27,780	-26,756	75,593	76,618	
37.5	705	1	0	38,892	-26,756	105,831	117,967	
32.5	546	1	0	50,004	-26,756	136,068	159,316	
27.5	340	1	0	61,116	-26,756	166,305	200,666	
22.5	229	1	0	72,228	-26,756	196,542	242,015	
17.5	133	1	0	83,340	-26,756	226,780	283,364	
12.5	57	1	0	94,452	-26,756	257,017	324,714	
7.5	22	1	0	105,564	-26,756	287,254	366,063	
2.5	9	1	0	116,676	-26,756	317,492	407,412	
-2.5	2	1	0	127,788	-26,756	347,729	448,761	
-7.5	1	1	0	138,900	-26,756	377,966	490,111	
Total	8,760	4,244	4,516					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	Therms	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-108,000	100	2
0	0	0	0	0	0	-64,800	100	17
0	0	0	0	0	0	-21,600	100	70
0	0	0	0	0	0	21,600	28	50
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
47,025	33,293,388	333	0	0	0	0	0	0
102,157	77,230,661	772	0	0	0	0	0	0
157,289	110,888,998	1,109	0	0	0	0	0	0
212,422	115,982,280	1,160	0	0	0	0	0	0
267,554	90,968,414	910	0	0	0	0	0	0
322,687	73,895,222	739	0	0	0	0	0	0
377,819	50,249,922	502	0	0	0	0	0	0
432,951	24,678,227	247	0	0	0	0	0	0
480,000	10,560,000	106	0	0	0	0	0	0
480,000	4,320,000	43	0	0	0	0	0	0
480,000	960,000	10	0	0	0	0	0	0
480,000	480,000	5	0	0	0	0	0	0
	593,507,112	5,935		0	0		18,472	139

System Summary		
Existing System	Usage	Gas
	kWh	Therms
Heating		5,935
Cooling	0	
Vent Cooling	139	
Lighting	3,270	
Equipment	65,402	
Total Usage	68,811	5,935
Unit Cost	\$0.154	\$1.560
Cost	\$10,597	\$9,259
Combined Cost	\$19,856	

Existing Building Envelope		
Wall Area	3675	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	3733	sqft
Roof Conductivity	0.3	u Value
Floor Area	3733	sqft
Volume	55995	cuft

Set Points		
Heating Set Point	55	deg F
Cooling Set Point	90	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	2.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	5,599.5	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	360,000	Btuh
Heating Efficiency	75	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Cooling Efficiency	12.0	EER
Vent Cooling	8,000	CFM
Vent Power	0.75	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-27,780	-26,756	-75,593	-130,129	
97.5	23	0	1	-16,668	-26,756	-45,356	-88,779	
92.5	93	0	1	-5,556	-26,756	-15,119	-47,430	
87.5	237	0	1	5,556	-26,756	15,119	-6,081	
82.5	452	0	1	16,668	-26,756	45,356	0	
77.5	692	0	1	27,780	-26,756	75,593	0	
72.5	858	0	1	38,892	-26,756	105,831	0	
67.5	753	0	1	50,004	-26,756	136,068	0	
62.5	735	0	1	61,116	-26,756	166,305	0	
57.5	671	0	1	72,228	-26,756	196,542	0	
52.5	736	1	0	5,556	-26,756	15,119	0	
47.5	708	1	0	16,668	-26,756	45,356	35,268	
42.5	756	1	0	27,780	-26,756	75,593	76,618	
37.5	705	1	0	38,892	-26,756	105,831	117,967	
32.5	546	1	0	50,004	-26,756	136,068	159,316	
27.5	340	1	0	61,116	-26,756	166,305	200,666	
22.5	229	1	0	72,228	-26,756	196,542	242,015	
17.5	133	1	0	83,340	-26,756	226,780	283,364	
12.5	57	1	0	94,452	-26,756	257,017	324,714	
7.5	22	1	0	105,564	-26,756	287,254	366,063	
2.5	9	1	0	116,676	-26,756	317,492	407,412	
-2.5	2	1	0	127,788	-26,756	347,729	448,761	
-7.5	1	1	0	138,900	-26,756	377,966	490,111	
Total	8,760	4,244	4,516					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	Therms	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-108,000	100	2
0	0	0	0	0	0	-64,800	100	17
0	0	0	0	0	0	-21,600	100	70
0	0	0	0	0	0	21,600	28	50
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
47,025	33,293,388	333	0	0	0	0	0	0
102,157	77,230,661	772	0	0	0	0	0	0
157,289	110,888,998	1,109	0	0	0	0	0	0
212,422	115,982,280	1,160	0	0	0	0	0	0
267,554	90,968,414	910	0	0	0	0	0	0
322,687	73,895,222	739	0	0	0	0	0	0
377,819	50,249,922	502	0	0	0	0	0	0
432,951	24,678,227	247	0	0	0	0	0	0
480,000	10,560,000	106	0	0	0	0	0	0
480,000	4,320,000	43	0	0	0	0	0	0
480,000	960,000	10	0	0	0	0	0	0
480,000	480,000	5	0	0	0	0	0	0
	593,507,112	5,935		0	0		18,472	139

System Summary		
Proposed System	Usage	Gas
	kWh	Therms
Heating		5,935
Cooling	0	-1,583
Vent Cooling	139	
Heat Recovery		
Lighting	3,270	
Equipment	65,402	
Total Usage	68,811	4,353
Unit Cost	\$0.154	\$1.560
Cost	\$10,597	\$6,790
Combined Cost	\$17,387	
Estimated Savings		
0 kWh		
1,583 Therms		
\$2,469 Dollars		

Notes:

- Negative Numbers indicate heat needs to be removed from the space
- Heating and Cooling columns determine if the building should be heating or cooling
- Vent Power is the ventilation fan motor horse power.

Energy Audit Department	Water Pollution Department
Energy Audit Building	Headworks
Headworks Process Water Pre Heat	

Existing Load Summaries per Unit						
Bin Temp	Bin	Coil Perf.	Coil Gain	Coil Recover	Coil flow	Coil Usage
deg F	Hours	1000 btuh	btuh	btu	gpm	gallons
47.5	708	-	8,230	5,826,840	7.00	297,360
42.5	756	-	24,830	18,771,480	7.00	317,520
37.5	705	33.13	41,430	29,208,150	8.29	350,498
32.5	546	-	58,030	31,684,380	11.61	380,213
27.5	340	-	74,630	25,374,200	14.93	304,490
22.5	229	-	91,230	20,891,670	18.25	250,700
17.5	133	-	107,830	14,341,390	21.57	172,097
12.5	57	-	124,430	7,092,510	24.89	85,110
7.5	22	-	141,030	3,102,660	28.21	37,232
2.5	9	-	157,630	1,418,670	31.53	17,024
-2.5	2	165.93	174,230	348,460	34.85	4,182
-7.5	1	-	190,830	190,830	38.17	2,290
Total	3,508			158,251,240		2,218,715
				1,583	Therms	

Energy Audit Department	Water Pollution Department
Energy Audit Building	Primary Building

Existing Building Envelope		
Wall Area	0	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	2500	sqft
Roof Conductivity	0.1	u Value
Floor Area	2500	sqft
Volume	37500	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	2.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	3,750.0	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	125,000	Btuh
Heating Efficiency	80	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	4,000	CFM
Vent Power	0.2	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-5,625	-17,918	-91,125	-114,668	
97.5	23	0	1	-4,375	-17,918	-70,875	-93,168	
92.5	93	0	1	-3,125	-17,918	-50,625	-71,668	
87.5	237	0	1	-1,875	-17,918	-30,375	-50,168	
82.5	452	0	1	-625	-17,918	-10,125	-28,668	
77.5	692	0	1	625	-17,918	10,125	-7,168	
72.5	858	0	1	1,875	-17,918	30,375	0	
67.5	753	0	1	3,125	-17,918	50,625	0	
62.5	735	1	0	625	-17,918	10,125	0	
57.5	671	1	0	1,875	-17,918	30,375	14,332	
52.5	736	1	0	3,125	-17,918	50,625	35,832	
47.5	708	1	0	4,375	-17,918	70,875	57,332	
42.5	756	1	0	5,625	-17,918	91,125	78,832	
37.5	705	1	0	6,875	-17,918	111,375	100,332	
32.5	546	1	0	8,125	-17,918	131,625	121,832	
27.5	340	1	0	9,375	-17,918	151,875	143,332	
22.5	229	1	0	10,625	-17,918	172,125	164,832	
17.5	133	1	0	11,875	-17,918	192,375	186,332	
12.5	57	1	0	13,125	-17,918	212,625	207,832	
7.5	22	1	0	14,375	-17,918	232,875	229,332	
2.5	9	1	0	15,625	-17,918	253,125	250,832	
-2.5	2	1	0	16,875	-17,918	273,375	272,332	
-7.5	1	1	0	18,125	-17,918	293,625	293,832	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-97,200	100	0
0	0	0	0	0	0	-75,600	100	5
0	0	0	0	0	0	-54,000	100	19
0	0	0	0	0	0	-32,400	100	47
0	0	0	0	0	0	-10,800	100	90
0	0	0	0	0	0	10,800	66	92
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
17,915	12,020,755	3,522	0	0	0	0	0	0
44,790	32,965,210	9,659	0	0	0	0	0	0
71,665	50,738,599	14,866	0	0	0	0	0	0
98,540	74,496,004	21,827	0	0	0	0	0	0
125,415	88,417,355	25,906	0	0	0	0	0	0
152,290	83,150,169	24,363	0	0	0	0	0	0
156,250	53,125,000	15,565	0	0	0	0	0	0
156,250	35,781,250	10,484	0	0	0	0	0	0
156,250	20,781,250	6,089	0	0	0	0	0	0
156,250	8,906,250	2,610	0	0	0	0	0	0
156,250	3,437,500	1,007	0	0	0	0	0	0
156,250	1,406,250	412	0	0	0	0	0	0
156,250	312,500	92	0	0	0	0	0	0
156,250	156,250	46	0	0	0	0	0	0
	465,694,342	136,447		0	0		126,630	253

System Summary		
Existing System	Usage	Gas
	kWh	Therms
Heating		4656
Cooling	0	
Vent Cooling	253	
Lighting	2,190	
Equipment	43,800	
Total	46,243	4656

Energy Audit Department	Water Pollution Department
Energy Audit Building	Secondary

Existing Building Envelope		
Wall Area	1956	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	1638	sqft
Roof Conductivity	0.15	u Value
Floor Area	1638	sqft
Volume	19656	cuft

Set Points		
Heating Set Point	60	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	4.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	1,965.6	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	100,000	Btuh
Heating Efficiency	80	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	5,000	CFM
Vent Power	0.75	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-18,731	-22,921	-47,764	-89,416	
97.5	23	0	1	-14,569	-22,921	-37,150	-74,640	
92.5	93	0	1	-10,406	-22,921	-26,536	-59,863	
87.5	237	0	1	-6,244	-22,921	-15,921	-45,086	
82.5	452	0	1	-2,081	-22,921	-5,307	-30,309	
77.5	692	0	1	2,081	-22,921	5,307	-15,533	
72.5	858	0	1	6,244	-22,921	15,921	-756	
67.5	753	0	1	10,406	-22,921	26,536	0	
62.5	735	0	1	14,569	-22,921	37,150	0	
57.5	671	1	0	2,081	-22,921	5,307	0	
52.5	736	1	0	6,244	-22,921	15,921	0	
47.5	708	1	0	10,406	-22,921	26,536	14,021	
42.5	756	1	0	14,569	-22,921	37,150	28,798	
37.5	705	1	0	18,731	-22,921	47,764	43,574	
32.5	546	1	0	22,894	-22,921	58,378	58,351	
27.5	340	1	0	27,056	-22,921	68,993	73,128	
22.5	229	1	0	31,219	-22,921	79,607	87,905	
17.5	133	1	0	35,381	-22,921	90,221	102,681	
12.5	57	1	0	39,544	-22,921	100,835	117,458	
7.5	22	1	0	43,706	-22,921	111,450	132,235	
2.5	9	1	0	47,869	-22,921	122,064	147,011	
-2.5	2	1	0	52,031	-22,921	132,678	161,788	
-7.5	1	1	0	56,194	-22,921	143,292	176,565	
Total	8,760	4,915	3,845					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-121,500	100	2
0	0	0	0	0	0	-94,500	100	17
0	0	0	0	0	0	-67,500	100	70
0	0	0	0	0	0	-40,500	100	178
0	0	0	0	0	0	-13,500	100	339
0	0	0	0	0	0	13,500	100	519
0	0	0	0	0	0	40,500	2	12
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
17,526	12,408,430	3,636	0	0	0	0	0	0
35,997	27,213,699	7,974	0	0	0	0	0	0
54,468	38,399,856	11,251	0	0	0	0	0	0
72,939	39,824,588	11,668	0	0	0	0	0	0
91,410	31,079,308	9,106	0	0	0	0	0	0
109,881	25,162,670	7,373	0	0	0	0	0	0
125,000	16,625,000	4,871	0	0	0	0	0	0
125,000	7,125,000	2,088	0	0	0	0	0	0
125,000	2,750,000	806	0	0	0	0	0	0
125,000	1,125,000	330	0	0	0	0	0	0
125,000	250,000	73	0	0	0	0	0	0
125,000	125,000	37	0	0	0	0	0	0
	202,088,551	59,211		0	0		151,501	1,136

System Summary		
Existing System	Usage	Gas
	kWh	Therms
Heating		2020
Cooling	0	
Vent Cooling	1,136	
Lighting	1,435	
Equipment	57,396	
Total	59,967	2020

Energy Audit Department	Water Pollution Department
Energy Audit Building	Air Blower Building

Existing Building Envelope		
Wall Area	5200	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	2500	sqft
Roof Conductivity	0.3	u Value
Floor Area	2500	sqft
Volume	62500	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	2.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	6,250.0	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	100,000	Btuh
Heating Efficiency	80	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	8,000	CFM
Vent Power	0.5	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-51,975	-17,918	-151,875	-221,768	
97.5	23	0	1	-40,425	-17,918	-118,125	-176,468	
92.5	93	0	1	-28,875	-17,918	-84,375	-131,168	
87.5	237	0	1	-17,325	-17,918	-50,625	-85,868	
82.5	452	0	1	-5,775	-17,918	-16,875	-40,568	
77.5	692	0	1	5,775	-17,918	16,875	0	
72.5	858	0	1	17,325	-17,918	50,625	0	
67.5	753	0	1	28,875	-17,918	84,375	0	
62.5	735	1	0	5,775	-17,918	16,875	4,732	
57.5	671	1	0	17,325	-17,918	50,625	50,032	
52.5	736	1	0	28,875	-17,918	84,375	95,332	
47.5	708	1	0	40,425	-17,918	118,125	140,632	
42.5	756	1	0	51,975	-17,918	151,875	185,932	
37.5	705	1	0	63,525	-17,918	185,625	231,232	
32.5	546	1	0	75,075	-17,918	219,375	276,532	
27.5	340	1	0	86,625	-17,918	253,125	321,832	
22.5	229	1	0	98,175	-17,918	286,875	367,132	
17.5	133	1	0	109,725	-17,918	320,625	412,432	
12.5	57	1	0	121,275	-17,918	354,375	457,732	
7.5	22	1	0	132,825	-17,918	388,125	503,032	
2.5	9	1	0	144,375	-17,918	421,875	548,332	
-2.5	2	1	0	155,925	-17,918	455,625	593,632	
-7.5	1	1	0	167,475	-17,918	489,375	638,932	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-194,400	100	1
0	0	0	0	0	0	-151,200	100	12
0	0	0	0	0	0	-108,000	100	47
0	0	0	0	0	0	-64,800	100	119
0	0	0	0	0	0	-21,600	100	226
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
5,915	4,347,295	1,274	0	0	0	0	0	0
62,540	41,964,130	12,295	0	0	0	0	0	0
119,165	87,705,210	25,697	0	0	0	0	0	0
125,000	88,500,000	25,930	0	0	0	0	0	0
125,000	94,500,000	27,688	0	0	0	0	0	0
125,000	88,125,000	25,820	0	0	0	0	0	0
125,000	68,250,000	19,997	0	0	0	0	0	0
125,000	42,500,000	12,452	0	0	0	0	0	0
125,000	28,625,000	8,387	0	0	0	0	0	0
125,000	16,625,000	4,871	0	0	0	0	0	0
125,000	7,125,000	2,088	0	0	0	0	0	0
125,000	2,750,000	806	0	0	0	0	0	0
125,000	1,125,000	330	0	0	0	0	0	0
125,000	250,000	73	0	0	0	0	0	0
125,000	125,000	37	0	0	0	0	0	0
	572,516,636	167,746		0	0		80,700	404

System Summary		
Existing System	Usage	Gas
	kWh	Therms
Heating		5723
Cooling	0	
Vent Cooling	404	
Lighting	2,190	
Equipment	43,800	
Total	46,394	5723

Energy Audit Department	Water Pollution Department
Energy Audit Building	Pump House Building

Existing Building Envelope		
Wall Area	8750	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	2500	sqft
Roof Conductivity	0.28	u Value
Floor Area	2500	sqft
Volume	25000	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	3.00	w/sqft
Occupancy	2	people
Occupant Sensible Load	250	btu/person
Infiltration	208.3	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	125,000	Btuh
Heating Efficiency	84	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	7,000	CFM
Vent Power	0.75	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-74,813	-26,951	-5,063	-106,826	
97.5	23	0	1	-58,188	-26,951	-3,938	-89,076	
92.5	93	0	1	-41,563	-26,951	-2,813	-71,326	
87.5	237	0	1	-24,938	-26,951	-1,688	-53,576	
82.5	452	0	1	-8,313	-26,951	-563	-35,826	
77.5	692	0	1	8,313	-26,951	563	-18,076	
72.5	858	0	1	24,938	-26,951	1,688	-326	
67.5	753	0	1	41,563	-26,951	2,813	0	
62.5	735	1	0	8,313	-26,951	563	0	
57.5	671	1	0	24,938	-26,951	1,688	0	
52.5	736	1	0	41,563	-26,951	2,813	17,424	
47.5	708	1	0	58,188	-26,951	3,938	35,174	
42.5	756	1	0	74,813	-26,951	5,063	52,924	
37.5	705	1	0	91,438	-26,951	6,188	70,674	
32.5	546	1	0	108,063	-26,951	7,313	88,424	
27.5	340	1	0	124,688	-26,951	8,438	106,174	
22.5	229	1	0	141,313	-26,951	9,563	123,924	
17.5	133	1	0	157,938	-26,951	10,688	141,674	
12.5	57	1	0	174,563	-26,951	11,813	159,424	
7.5	22	1	0	191,188	-26,951	12,938	177,174	
2.5	9	1	0	207,813	-26,951	14,063	194,924	
-2.5	2	1	0	224,438	-26,951	15,188	212,674	
-7.5	1	1	0	241,063	-26,951	16,313	230,424	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-170,100	100	2
0	0	0	0	0	0	-132,300	100	17
0	0	0	0	0	0	-94,500	100	70
0	0	0	0	0	0	-56,700	100	178
0	0	0	0	0	0	-18,900	100	339
0	0	0	0	0	0	18,900	96	496
0	0	0	0	0	0	56,700	1	4
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
20,743	15,266,962	4,473	0	0	0	0	0	0
41,874	29,646,868	8,686	0	0	0	0	0	0
63,005	47,631,825	13,956	0	0	0	0	0	0
84,136	59,315,888	17,379	0	0	0	0	0	0
105,267	57,475,763	16,840	0	0	0	0	0	0
126,398	42,975,292	12,592	0	0	0	0	0	0
147,529	33,784,111	9,899	0	0	0	0	0	0
148,810	19,791,667	5,799	0	0	0	0	0	0
148,810	8,482,143	2,485	0	0	0	0	0	0
148,810	3,273,810	959	0	0	0	0	0	0
148,810	1,339,286	392	0	0	0	0	0	0
148,810	297,619	87	0	0	0	0	0	0
148,810	148,810	44	0	0	0	0	0	0
	319,430,042	93,592		0	0		147,375	1,105

System Summary		
Existing System	Usage	Gas
	kWh	Therms
Heating		3193
Cooling	0	
Vent Cooling	1,105	
Lighting	2,190	
Equipment	65,700	
Total	68,995	3193

Energy Audit Department	Water Pollution Department
Energy Audit Building	Sludge Thickening Building

Existing Building Envelope		
Wall Area	900	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	2500	sqft
Roof Conductivity	0.3	u Value
Floor Area	2500	sqft
Volume	25000	cuft

Set Points		
Heating Set Point	60	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	3.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	2,500.0	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	176,720	Btuh
Heating Efficiency	80	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	4,000	CFM
Vent Power	0.75	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-22,950	-26,451	-60,750	-110,151	
97.5	23	0	1	-17,850	-26,451	-47,250	-91,551	
92.5	93	0	1	-12,750	-26,451	-33,750	-72,951	
87.5	237	0	1	-7,650	-26,451	-20,250	-54,351	
82.5	452	0	1	-2,550	-26,451	-6,750	-35,751	
77.5	692	0	1	2,550	-26,451	6,750	-17,151	
72.5	858	0	1	7,650	-26,451	20,250	0	
67.5	753	0	1	12,750	-26,451	33,750	0	
62.5	735	0	1	17,850	-26,451	47,250	0	
57.5	671	1	0	2,550	-26,451	6,750	0	
52.5	736	1	0	7,650	-26,451	20,250	1,449	
47.5	708	1	0	12,750	-26,451	33,750	20,049	
42.5	756	1	0	17,850	-26,451	47,250	38,649	
37.5	705	1	0	22,950	-26,451	60,750	57,249	
32.5	546	1	0	28,050	-26,451	74,250	75,849	
27.5	340	1	0	33,150	-26,451	87,750	94,449	
22.5	229	1	0	38,250	-26,451	101,250	113,049	
17.5	133	1	0	43,350	-26,451	114,750	131,649	
12.5	57	1	0	48,450	-26,451	128,250	150,249	
7.5	22	1	0	53,550	-26,451	141,750	168,849	
2.5	9	1	0	58,650	-26,451	155,250	187,449	
-2.5	2	1	0	63,750	-26,451	168,750	206,049	
-7.5	1	1	0	68,850	-26,451	182,250	224,649	
Total	8,760	4,915	3,845					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-97,200	100	2
0	0	0	0	0	0	-75,600	100	17
0	0	0	0	0	0	-54,000	100	70
0	0	0	0	0	0	-32,400	100	178
0	0	0	0	0	0	-10,800	100	339
0	0	0	0	0	0	10,800	100	519
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
1,812	1,333,310	391	0	0	0	0	0	0
25,062	17,743,586	5,199	0	0	0	0	0	0
48,312	36,523,541	10,701	0	0	0	0	0	0
71,562	50,450,902	14,782	0	0	0	0	0	0
94,812	51,767,113	15,168	0	0	0	0	0	0
118,062	40,140,931	11,761	0	0	0	0	0	0
141,312	32,360,348	9,481	0	0	0	0	0	0
164,562	21,886,688	6,413	0	0	0	0	0	0
187,812	10,705,259	3,137	0	0	0	0	0	0
211,062	4,643,354	1,360	0	0	0	0	0	0
220,900	1,988,100	583	0	0	0	0	0	0
220,900	441,800	129	0	0	0	0	0	0
220,900	220,900	65	0	0	0	0	0	0
	270,205,833	79,170		0	0		149,900	1,124

System Summary		
Existing System	Usage kWh	Gas Therms
Heating		2701
Cooling	0	
Vent Cooling	1,124	
Lighting	2,190	
Equipment	65,700	
Total	69,014	2701

Energy Audit Department	Water Pollution Department
Energy Audit Building	Sludge Disposal

(Only did the enclosed part of building for heat, boosted ventilation for Garage space)

Existing Building Envelope		
Wall Area	1687	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	1080	sqft
Roof Conductivity	0.3	u Value
Floor Area	1080	sqft
Volume	10800	cuft

Set Points		
Heating Set Point	60	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	11.50	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	9,000.0	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	100,000	Btuh
Heating Efficiency	80	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	16,000	CFM
Vent Power	0.75	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-18,677	-42,758	-218,700	-280,135	
97.5	23	0	1	-14,527	-42,758	-170,100	-227,385	
92.5	93	0	1	-10,376	-42,758	-121,500	-174,634	
87.5	237	0	1	-6,226	-42,758	-72,900	-121,884	
82.5	452	0	1	-2,075	-42,758	-24,300	-69,133	
77.5	692	0	1	2,075	-42,758	24,300	-16,383	
72.5	858	0	1	6,226	-42,758	72,900	0	
67.5	753	0	1	10,376	-42,758	121,500	0	
62.5	735	0	1	14,527	-42,758	170,100	0	
57.5	671	1	0	2,075	-42,758	24,300	0	
52.5	736	1	0	6,226	-42,758	72,900	36,368	
47.5	708	1	0	10,376	-42,758	121,500	89,118	
42.5	756	1	0	14,527	-42,758	170,100	141,869	
37.5	705	1	0	18,677	-42,758	218,700	194,619	
32.5	546	1	0	22,828	-42,758	267,300	247,370	
27.5	340	1	0	26,978	-42,758	315,900	300,120	
22.5	229	1	0	31,129	-42,758	364,500	352,871	
17.5	133	1	0	35,279	-42,758	413,100	405,621	
12.5	57	1	0	39,430	-42,758	461,700	458,372	
7.5	22	1	0	43,580	-42,758	510,300	511,122	
2.5	9	1	0	47,731	-42,758	558,900	563,873	
-2.5	2	1	0	51,881	-42,758	607,500	616,623	
-7.5	1	1	0	56,032	-42,758	656,100	669,374	
Total	8,760	4,915	3,845					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-388,800	100	2
0	0	0	0	0	0	-302,400	100	17
0	0	0	0	0	0	-216,000	100	70
0	0	0	0	0	0	-129,600	100	178
0	0	0	0	0	0	-43,200	100	339
0	0	0	0	0	0	43,200	38	197
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
45,460	33,458,271	9,803	0	0	0	0	0	0
111,398	78,869,595	23,109	0	0	0	0	0	0
125,000	94,500,000	27,688	0	0	0	0	0	0
125,000	88,125,000	25,820	0	0	0	0	0	0
125,000	68,250,000	19,997	0	0	0	0	0	0
125,000	42,500,000	12,452	0	0	0	0	0	0
125,000	28,625,000	8,387	0	0	0	0	0	0
125,000	16,625,000	4,871	0	0	0	0	0	0
125,000	7,125,000	2,088	0	0	0	0	0	0
125,000	2,750,000	806	0	0	0	0	0	0
125,000	1,125,000	330	0	0	0	0	0	0
125,000	250,000	73	0	0	0	0	0	0
125,000	125,000	37	0	0	0	0	0	0
	462,327,866	135,461		0	0		106,943	802

System Summary		
Existing System	Usage kWh	Gas Therms
Heating		4622
Cooling	0	
Vent Cooling	802	
Lighting	946	
Equipment	108,799	
Total	110,547	4622

Energy Audit Department	Water Pollution Department
Energy Audit Building	Cherry Hill Pump Station

Existing Building Envelope		
Wall Area	509	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	250	sqft
Roof Conductivity	0.28	u Value
Floor Area	250	sqft
Volume	2000	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	3.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	16.7	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	11,946	Btuh
Heating Efficiency	100	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	200	CFM
Vent Power	0.2	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-5,011	-2,645	-405	-8,061	
97.5	23	0	1	-3,897	-2,645	-315	-6,857	
92.5	93	0	1	-2,784	-2,645	-225	-5,654	
87.5	237	0	1	-1,670	-2,645	-135	-4,450	
82.5	452	0	1	-557	-2,645	-45	-3,247	
77.5	692	0	1	557	-2,645	45	-2,043	
72.5	858	0	1	1,670	-2,645	135	-840	
67.5	753	0	1	2,784	-2,645	225	0	
62.5	735	1	0	557	-2,645	45	0	
57.5	671	1	0	1,670	-2,645	135	0	
52.5	736	1	0	2,784	-2,645	225	364	
47.5	708	1	0	3,897	-2,645	315	1,567	
42.5	756	1	0	5,011	-2,645	405	2,771	
37.5	705	1	0	6,124	-2,645	495	3,974	
32.5	546	1	0	7,238	-2,645	585	5,178	
27.5	340	1	0	8,351	-2,645	675	6,381	
22.5	229	1	0	9,465	-2,645	765	7,585	
17.5	133	1	0	10,578	-2,645	855	8,788	
12.5	57	1	0	11,692	-2,645	945	9,992	
7.5	22	1	0	12,805	-2,645	1,035	11,195	
2.5	9	1	0	13,919	-2,645	1,125	12,399	
-2.5	2	1	0	15,032	-2,645	1,215	13,602	
-7.5	1	1	0	16,146	-2,645	1,305	14,806	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-4,860	100	0
0	0	0	0	0	0	-3,780	100	5
0	0	0	0	0	0	-2,700	100	19
0	0	0	0	0	0	-1,620	100	47
0	0	0	0	0	0	-540	100	90
0	0	0	0	0	0	540	100	138
0	0	0	0	0	0	1,620	52	89
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
364	267,665	78	0	0	0	0	0	0
1,567	1,109,560	325	0	0	0	0	0	0
2,771	2,094,630	614	0	0	0	0	0	0
3,974	2,801,793	821	0	0	0	0	0	0
5,178	2,827,011	828	0	0	0	0	0	0
6,381	2,169,600	636	0	0	0	0	0	0
7,585	1,736,891	509	0	0	0	0	0	0
8,788	1,168,827	342	0	0	0	0	0	0
9,992	569,525	167	0	0	0	0	0	0
11,195	246,294	72	0	0	0	0	0	0
11,946	107,510	32	0	0	0	0	0	0
11,946	23,891	7	0	0	0	0	0	0
11,946	11,946	4	0	0	0	0	0	0
	15,135,142	4,435		0	0		194,380	389

System Summary	
Existing System	Usage kWh
Heating	4,435
Cooling	0
Vent Cooling	389
Lighting	219
Equipment	6,570
Total	11,612

Energy Audit Department	Water Pollution Department
Energy Audit Building	Lufkin Pump Station

Existing Building Envelope		
Wall Area	531	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	210	sqft
Roof Conductivity	0.28	u Value
Floor Area	210	sqft
Volume	1680	cuft

Set Points		
Heating Set Point	55	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	1.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	14.0	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	34,130	Btuh
Heating Efficiency	100	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	250	CFM
Vent Power	0.2	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-4,907	-788	-340	-6,036	
97.5	23	0	1	-3,817	-788	-265	-4,870	
92.5	93	0	1	-2,726	-788	-189	-3,704	
87.5	237	0	1	-1,636	-788	-113	-2,538	
82.5	452	0	1	-545	-788	-38	-1,371	
77.5	692	0	1	545	-788	38	-205	
72.5	858	0	1	1,636	-788	113	0	
67.5	753	0	1	2,726	-788	189	0	
62.5	735	0	1	3,817	-788	265	0	
57.5	671	0	1	4,907	-788	340	0	
52.5	736	1	0	545	-788	38	0	
47.5	708	1	0	1,636	-788	113	961	
42.5	756	1	0	2,726	-788	189	2,127	
37.5	705	1	0	3,817	-788	265	3,293	
32.5	546	1	0	4,907	-788	340	4,459	
27.5	340	1	0	5,998	-788	416	5,625	
22.5	229	1	0	7,088	-788	491	6,791	
17.5	133	1	0	8,179	-788	567	7,957	
12.5	57	1	0	9,269	-788	643	9,123	
7.5	22	1	0	10,360	-788	718	10,290	
2.5	9	1	0	11,450	-788	794	11,456	
-2.5	2	1	0	12,541	-788	869	12,622	
-7.5	1	1	0	13,631	-788	945	13,788	
Total	8,760	4,244	4,516					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-6,075	100	0
0	0	0	0	0	0	-4,725	100	5
0	0	0	0	0	0	-3,375	100	19
0	0	0	0	0	0	-2,025	100	47
0	0	0	0	0	0	-675	100	90
0	0	0	0	0	0	675	30	42
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
961	680,209	199	0	0	0	0	0	0
2,127	1,607,896	471	0	0	0	0	0	0
3,293	2,321,528	680	0	0	0	0	0	0
4,459	2,434,640	713	0	0	0	0	0	0
5,625	1,912,550	560	0	0	0	0	0	0
6,791	1,555,196	456	0	0	0	0	0	0
7,957	1,058,327	310	0	0	0	0	0	0
9,123	520,036	152	0	0	0	0	0	0
10,290	226,370	66	0	0	0	0	0	0
11,456	103,101	30	0	0	0	0	0	0
12,622	25,243	7	0	0	0	0	0	0
13,788	13,788	4	0	0	0	0	0	0
	12,458,884	3,650		0	0		101,752	204

System Summary	
Existing System	Usage kWh
Heating	3,650
Cooling	0
Vent Cooling	204
Lighting	184
Equipment	1,840
Total	5,877

Energy Audit Department	Water Pollution Department
Energy Audit Building	Matthews Pump Station

Existing Building Envelope		
Wall Area	666	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	250	sqft
Roof Conductivity	0.28	u Value
Floor Area	250	sqft
Volume	2250	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	15.50	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	18.8	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	51,195	Btuh
Heating Efficiency	100	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	700	CFM
Vent Power	0.2	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-6,071	-13,311	-456	-19,837	
97.5	23	0	1	-4,722	-13,311	-354	-18,387	
92.5	93	0	1	-3,373	-13,311	-253	-16,936	
87.5	237	0	1	-2,024	-13,311	-152	-15,486	
82.5	452	0	1	-675	-13,311	-51	-14,036	
77.5	692	0	1	675	-13,311	51	-12,586	
72.5	858	0	1	2,024	-13,311	152	-11,135	
67.5	753	0	1	3,373	-13,311	253	-9,685	
62.5	735	1	0	675	-13,311	51	0	
57.5	671	1	0	2,024	-13,311	152	0	
52.5	736	1	0	3,373	-13,311	253	0	
47.5	708	1	0	4,722	-13,311	354	0	
42.5	756	1	0	6,071	-13,311	456	0	
37.5	705	1	0	7,420	-13,311	557	0	
32.5	546	1	0	8,769	-13,311	658	0	
27.5	340	1	0	10,118	-13,311	759	0	
22.5	229	1	0	11,467	-13,311	861	0	
17.5	133	1	0	12,816	-13,311	962	467	
12.5	57	1	0	14,165	-13,311	1,063	1,917	
7.5	22	1	0	15,514	-13,311	1,164	3,367	
2.5	9	1	0	16,863	-13,311	1,266	4,817	
-2.5	2	1	0	18,212	-13,311	1,367	6,268	
-7.5	1	1	0	19,561	-13,311	1,468	7,718	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-17,010	100	0
0	0	0	0	0	0	-13,230	100	5
0	0	0	0	0	0	-9,450	100	19
0	0	0	0	0	0	-5,670	100	47
0	0	0	0	0	0	-1,890	100	90
0	0	0	0	0	0	1,890	100	138
0	0	0	0	0	0	5,670	100	172
0	0	0	0	0	0	9,450	100	151
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
467	62,068	18	0	0	0	0	0	0
1,917	109,265	32	0	0	0	0	0	0
3,367	74,078	22	0	0	0	0	0	0
4,817	43,357	13	0	0	0	0	0	0
6,268	12,535	4	0	0	0	0	0	0
7,718	7,718	2	0	0	0	0	0	0
	309,020	91		0	0		311,000	622

System Summary	
Existing System	Usage kWh
Heating	91
Cooling	0
Vent Cooling	622
Lighting	219
Equipment	33,945
Total	34,877

Energy Audit Department	Water Pollution Department
Energy Audit Building	Middle Pump Station

Existing Building Envelope		
Wall Area	560	sqft
Wall Conductivity	0.35	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	250	sqft
Roof Conductivity	0.28	u Value
Floor Area	250	sqft
Volume	2000	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	16.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	16.7	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	34,130	Btuh
Heating Efficiency	100	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	500	CFM
Vent Power	0.2	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-5,985	-13,737	-405	-20,127	
97.5	23	0	1	-4,655	-13,737	-315	-18,707	
92.5	93	0	1	-3,325	-13,737	-225	-17,287	
87.5	237	0	1	-1,995	-13,737	-135	-15,867	
82.5	452	0	1	-665	-13,737	-45	-14,447	
77.5	692	0	1	665	-13,737	45	-13,027	
72.5	858	0	1	1,995	-13,737	135	-11,607	
67.5	753	0	1	3,325	-13,737	225	-10,187	
62.5	735	1	0	665	-13,737	45	0	
57.5	671	1	0	1,995	-13,737	135	0	
52.5	736	1	0	3,325	-13,737	225	0	
47.5	708	1	0	4,655	-13,737	315	0	
42.5	756	1	0	5,985	-13,737	405	0	
37.5	705	1	0	7,315	-13,737	495	0	
32.5	546	1	0	8,645	-13,737	585	0	
27.5	340	1	0	9,975	-13,737	675	0	
22.5	229	1	0	11,305	-13,737	765	0	
17.5	133	1	0	12,635	-13,737	855	0	
12.5	57	1	0	13,965	-13,737	945	1,173	
7.5	22	1	0	15,295	-13,737	1,035	2,593	
2.5	9	1	0	16,625	-13,737	1,125	4,013	
-2.5	2	1	0	17,955	-13,737	1,215	5,433	
-7.5	1	1	0	19,285	-13,737	1,305	6,853	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-12,150	100	0
0	0	0	0	0	0	-9,450	100	5
0	0	0	0	0	0	-6,750	100	19
0	0	0	0	0	0	-4,050	100	47
0	0	0	0	0	0	-1,350	100	90
0	0	0	0	0	0	1,350	100	138
0	0	0	0	0	0	4,050	100	172
0	0	0	0	0	0	6,750	100	151
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
1,173	66,842	20	0	0	0	0	0	0
2,593	57,039	17	0	0	0	0	0	0
4,013	36,114	11	0	0	0	0	0	0
5,433	10,865	3	0	0	0	0	0	0
6,853	6,853	2	0	0	0	0	0	0
	177,713	52		0	0		311,000	622

System Summary	
Existing System	Usage kWh
Heating	52
Cooling	0
Vent Cooling	622
Lighting	219
Equipment	35,040
Total	35,933

Energy Audit Department	Water Pollution Department
Energy Audit Building	Minor Pump Station

Existing Building Envelope		
Wall Area	810	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	405	sqft
Roof Conductivity	0.28	u Value
Floor Area	405	sqft
Volume	4050	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	10.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	33.8	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	51,195	Btuh
Heating Efficiency	100	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	500	CFM
Vent Power	0.2	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-8,019	-13,961	-820	-22,800	
97.5	23	0	1	-6,237	-13,961	-638	-20,836	
92.5	93	0	1	-4,455	-13,961	-456	-18,872	
87.5	237	0	1	-2,673	-13,961	-273	-16,907	
82.5	452	0	1	-891	-13,961	-91	-14,943	
77.5	692	0	1	891	-13,961	91	-12,979	
72.5	858	0	1	2,673	-13,961	273	-11,015	
67.5	753	0	1	4,455	-13,961	456	-9,050	
62.5	735	1	0	891	-13,961	91	0	
57.5	671	1	0	2,673	-13,961	273	0	
52.5	736	1	0	4,455	-13,961	456	0	
47.5	708	1	0	6,237	-13,961	638	0	
42.5	756	1	0	8,019	-13,961	820	0	
37.5	705	1	0	9,801	-13,961	1,002	0	
32.5	546	1	0	11,583	-13,961	1,185	0	
27.5	340	1	0	13,365	-13,961	1,367	771	
22.5	229	1	0	15,147	-13,961	1,549	2,735	
17.5	133	1	0	16,929	-13,961	1,731	4,699	
12.5	57	1	0	18,711	-13,961	1,914	6,664	
7.5	22	1	0	20,493	-13,961	2,096	8,628	
2.5	9	1	0	22,275	-13,961	2,278	10,592	
-2.5	2	1	0	24,057	-13,961	2,460	12,556	
-7.5	1	1	0	25,839	-13,961	2,643	14,521	
Total	8,760	5,650	3,110					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-12,150	100	0
0	0	0	0	0	0	-9,450	100	5
0	0	0	0	0	0	-6,750	100	19
0	0	0	0	0	0	-4,050	100	47
0	0	0	0	0	0	-1,350	100	90
0	0	0	0	0	0	1,350	100	138
0	0	0	0	0	0	4,050	100	172
0	0	0	0	0	0	6,750	100	151
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
771	262,139	77	0	0	0	0	0	0
2,735	626,372	184	0	0	0	0	0	0
4,699	625,033	183	0	0	0	0	0	0
6,664	379,834	111	0	0	0	0	0	0
8,628	189,816	56	0	0	0	0	0	0
10,592	95,330	28	0	0	0	0	0	0
12,556	25,113	7	0	0	0	0	0	0
14,521	14,521	4	0	0	0	0	0	0
	2,218,158	650		0	0		311,000	622

System Summary	
Existing System	Usage kWh
Heating	650
Cooling	0
Vent Cooling	622
Lighting	355
Equipment	35,478
Total	37,105

Energy Audit Department	Water Pollution Department
Energy Audit Building	Tyler Pump Station

Existing Building Envelope		
Wall Area	590	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	212.5	sqft
Roof Conductivity	0.2	u Value
Floor Area	212.5	sqft
Volume	2125	cuft

Set Points		
Heating Set Point	50	deg F
Cooling Set Point	75	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	11.50	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	17.7	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	17,065	Btuh
Heating Efficiency	100	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	600	CFM
Vent Power	0.2	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-6,036	-8,413	-526	-14,975	
97.5	23	0	1	-4,939	-8,413	-430	-13,782	
92.5	93	0	1	-3,841	-8,413	-335	-12,589	
87.5	237	0	1	-2,744	-8,413	-239	-11,396	
82.5	452	0	1	-1,646	-8,413	-143	-10,203	
77.5	692	0	1	-549	-8,413	-48	-9,010	
72.5	858	0	1	549	-8,413	48	-7,816	
67.5	753	0	1	1,646	-8,413	143	-6,623	
62.5	735	0	1	2,744	-8,413	239	-5,430	
57.5	671	0	1	3,841	-8,413	335	-4,237	
52.5	736	0	1	4,939	-8,413	430	-3,044	
47.5	708	1	0	549	-8,413	48	0	
42.5	756	1	0	1,646	-8,413	143	0	
37.5	705	1	0	2,744	-8,413	239	0	
32.5	546	1	0	3,841	-8,413	335	0	
27.5	340	1	0	4,939	-8,413	430	0	
22.5	229	1	0	6,036	-8,413	526	0	
17.5	133	1	0	7,134	-8,413	622	0	
12.5	57	1	0	8,231	-8,413	717	535	
7.5	22	1	0	9,329	-8,413	813	1,729	
2.5	9	1	0	10,426	-8,413	908	2,922	
-2.5	2	1	0	11,524	-8,413	1,004	4,115	
-7.5	1	1	0	12,621	-8,413	1,100	5,308	
Total	8,760	3,508	5,252					

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-17,820	100	0
0	0	0	0	0	0	-14,580	100	5
0	0	0	0	0	0	-11,340	100	19
0	0	0	0	0	0	-8,100	100	47
0	0	0	0	0	0	-4,860	100	90
0	0	0	0	0	0	-1,620	100	138
0	0	0	0	0	0	1,620	100	172
0	0	0	0	0	0	4,860	100	151
0	0	0	0	0	0	8,100	67	99
0	0	0	0	0	0	11,340	37	50
0	0	0	0	0	0	14,580	21	31
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
535	30,517	9	0	0	0	0	0	0
1,729	38,027	11	0	0	0	0	0	0
2,922	26,295	8	0	0	0	0	0	0
4,115	8,230	2	0	0	0	0	0	0
5,308	5,308	2	0	0	0	0	0	0
	108,377	32		0	0		400,712	801

System Summary	
Existing System	Usage kWh
Heating	32
Cooling	0
Vent Cooling	801
Lighting	186
Equipment	21,407
Total	22,427

Energy Audit Department	Water Pollution Department
Energy Audit Building	Headworks

Existing Building Envelope		
Wall Area	3675	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	3733	sqft
Roof Conductivity	0.3	u Value
Floor Area	3733	sqft
Volume	55995	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	2.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	5,599.5	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	360,000	Btuh
Heating Efficiency	75	%
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	8,000	CFM
Vent Power	0.75	kW

Headworks Process Water Heat Pump		
Proposed Building Envelope		
Wall Area	3675	sqft
Wall Conductivity	0.3	u Value
Window Area	0	sqft
Window Conductivity	1	u Value
Roof Area	3733	sqft
Roof Conductivity	0.3	u Value
Floor Area	3733	sqft
Volume	55995	cuft

Set Points		
Heating Set Point	65	deg F
Cooling Set Point	80	deg F

Internal Loads		
Lighting Density	0.10	w/sqft
Equipment Density	2.00	w/sqft
Occupancy	0	people
Occupant Sensible Load	250	btu/person
Infiltration	5,599.5	cfm
Exhaust	0	cfm

Building Equipment		
Heating System	480,000	Btuh
Heating Efficiency	100	%
Heating COP	3.8	
Cooling System	0	Btuh
Cooling Efficiency	12.0	EER
Vent Cooling	8,000	CFM
Vent Power	0.75	kW

Existing Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours			btuh	btuh	btuh	btuh	
102.5	2	0	1	-50,004	-26,756	-136,068	-212,827	
97.5	23	0	1	-38,892	-26,756	-105,831	-171,478	
92.5	93	0	1	-27,780	-26,756	-75,593	-130,129	
87.5	237	0	1	-16,668	-26,756	-45,356	-88,779	
82.5	452	0	1	-5,556	-26,756	-15,119	-47,430	
77.5	692	0	1	5,556	-26,756	15,119	-6,081	
72.5	858	0	1	16,668	-26,756	45,356	0	
67.5	753	0	1	27,780	-26,756	75,593	0	
62.5	735	1	0	5,556	-26,756	15,119	0	
57.5	671	1	0	16,668	-26,756	45,356	35,268	
52.5	736	1	0	27,780	-26,756	75,593	76,618	
47.5	708	1	0	38,892	-26,756	105,831	117,967	
42.5	756	1	0	50,004	-26,756	136,068	159,316	
37.5	705	1	0	61,116	-26,756	166,305	200,666	
32.5	546	1	0	72,228	-26,756	196,542	242,015	
27.5	340	1	0	83,340	-26,756	226,780	283,364	
22.5	229	1	0	94,452	-26,756	257,017	324,714	
17.5	133	1	0	105,564	-26,756	287,254	366,063	
12.5	57	1	0	116,676	-26,756	317,492	407,412	
7.5	22	1	0	127,788	-26,756	347,729	448,761	
2.5	9	1	0	138,900	-26,756	377,966	490,111	
-2.5	2	1	0	150,012	-26,756	408,204	531,460	
-7.5	1	1	0	161,124	-26,756	438,441	572,809	
Total	8,760	5,650	3,110					

Proposed Load Summaries								
Bin Temp	Bin	Heating	Cooling	Shell Load	Internal Load	Ventilation Load	Combined Load	
deg F	Hours		*	btuh	btuh	btuh	btuh	
102.5	2	0	1	-50,004	-26,756	-136,068	-212,827	
97.5	23	0	1	-38,892	-26,756	-105,831	-171,478	
92.5	93	0	1	-27,780	-26,756	-75,593	-130,129	
87.5	237	0	1	-16,668	-26,756	-45,356	-88,779	
82.5	452	0	1	-5,556	-26,756	-15,119	-47,430	
77.5	692	0	1	5,556	-26,756	15,119	-6,081	
72.5	858	0	1	16,668	-26,756	45,356	0	
67.5	753	0	1	27,780	-26,756	75,593	0	
62.5	735	1	0	5,556	-26,756	15,119	0	
57.5	671	1	0	16,668	-26,756	45,356	35,268	
52.5	736	1	0	27,780	-26,756	75,593	76,618	
47.5	708	1	0	38,892	-26,756	105,831	117,967	
42.5	756	1	0	50,004	-26,756	136,068	159,316	
37.5	705	1	0	61,116	-26,756	166,305	200,666	
32.5	546	1	0	72,228	-26,756	196,542	242,015	
27.5	340	1	0	83,340	-26,756	226,780	283,364	
22.5	229	1	0	94,452	-26,756	257,017	324,714	
17.5	133	1	0	105,564	-26,756	287,254	366,063	
12.5	57	1	0	116,676	-26,756	317,492	407,412	
7.5	22	1	0	127,788	-26,756	347,729	448,761	
2.5	9	1	0	138,900	-26,756	377,966	490,111	
-2.5	2	1	0	150,012	-26,756	408,204	531,460	
-7.5	1	1	0	161,124	-26,756	438,441	572,809	
Total	8,760	5,650	3,110					

Notes:

1. Negative Numbers indicate heat needs to be removed from the space
2. Heating and Cooling columns determine if the building should be heating or cooling
3. Vent Power is the ventilation fan motor horse power.

Existing Heating System			Existing Cooling System			Existing Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	Therms	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-194,400	100	2
0	0	0	0	0	0	-151,200	100	17
0	0	0	0	0	0	-108,000	100	70
0	0	0	0	0	0	-64,800	100	178
0	0	0	0	0	0	-21,600	100	339
0	0	0	0	0	0	21,600	28	146
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
47,025	31,553,479	316	0	0	0	0	0	0
102,157	75,187,522	752	0	0	0	0	0	0
157,289	111,360,866	1,114	0	0	0	0	0	0
212,422	160,590,850	1,606	0	0	0	0	0	0
267,554	188,625,682	1,886	0	0	0	0	0	0
322,687	176,186,861	1,762	0	0	0	0	0	0
377,819	128,458,446	1,285	0	0	0	0	0	0
432,951	99,145,861	991	0	0	0	0	0	0
480,000	63,840,000	638	0	0	0	0	0	0
480,000	27,360,000	274	0	0	0	0	0	0
480,000	10,560,000	106	0	0	0	0	0	0
480,000	4,320,000	43	0	0	0	0	0	0
480,000	960,000	10	0	0	0	0	0	0
480,000	480,000	5	0	0	0	0	0	0
	1,078,629,567	10,786		0	0		100,181	751

Proposed Heating System			Proposed Cooling System			Proposed Ventilation Cooling		
Output	Usage	Usage	Output	Usage	Usage	Cooling	On Time	Usage
Btuh	Btu	kWh	Btuh	Btu	kWh	Btuh	%	kWh
0	0	0	0	0	0	-194,400	100	2
0	0	0	0	0	0	-151,200	100	17
0	0	0	0	0	0	-108,000	100	70
0	0	0	0	0	0	-64,800	100	178
0	0	0	0	0	0	-21,600	100	339
0	0	0	0	0	0	21,600	28	146
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
35,268	23,665,109	1,825	0	0	0	0	0	0
76,618	56,390,641	4,348	0	0	0	0	0	0
117,967	83,520,650	6,440	0	0	0	0	0	0
159,316	120,443,137	9,287	0	0	0	0	0	0
200,666	141,469,261	10,908	0	0	0	0	0	0
242,015	132,140,146	10,189	0	0	0	0	0	0
283,364	96,343,834	7,429	0	0	0	0	0	0
324,714	74,359,396	5,733	0	0	0	0	0	0
366,063	48,686,355	3,754	0	0	0	0	0	0
407,412	23,222,491	1,791	0	0	0	0	0	0
448,761	9,872,751	761	0	0	0	0	0	0
480,000	4,320,000	333	0	0	0	0	0	0
480,000	960,000	74	0	0	0	0	0	0
480,000	480,000	37	0	0	0	0	0	0
	815,873,772	62,908		0	0		100,181	751

System Summary		
Existing System	Usage	Gas
	kWh	Therms
Heating		10,786
Cooling	0	
Vent Cooling	751	
Lighting	3,270	
Equipment	65,402	
Total Usage	69,424	10,786
Unit Cost	\$0.154	\$1.560
Cost	\$10,691	\$16,827
Combined Cost	\$27,518	

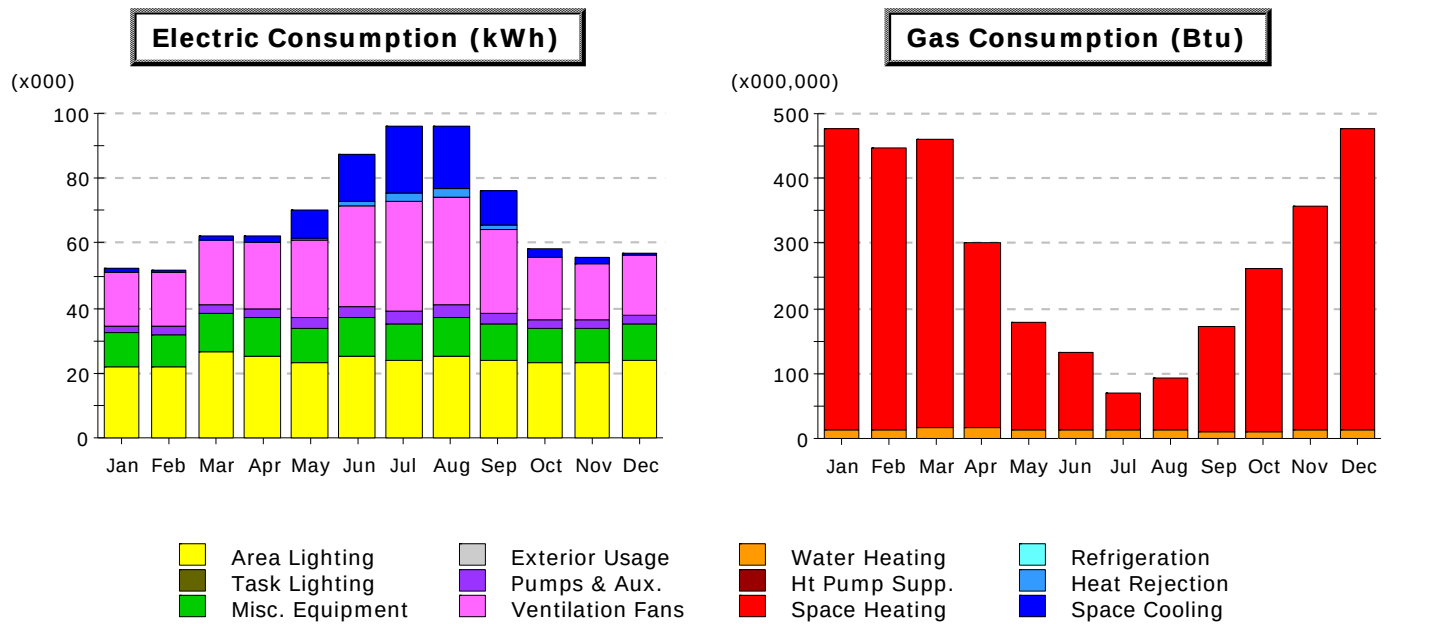
System Summary		
Proposed System	Usage	Gas
	kWh	Therms
Heating	62,908	0
Cooling	0	
Vent Cooling	751	
Lighting	3,270	
Equipment	65,402	
Total Usage	132,331	0
Unit Cost	\$0.154	\$1.560
Cost	\$20,379	\$0
Combined Cost	\$20,379	
Estimated Savings		
-62,908 kWh		
10,786 Therms		
\$7,139 Dollars		

Energy Audit Department	Water Pollution Department
Energy Audit Building	Headworks
Headworks Process Water Pre Heat	

Existing Load Summaries per Unit						
Bin Temp	Bin	Coil Perf.	Coil Gain	Coil Recover	Coil flow	Coil Usage
deg F	Hours	1000 btuh	btuh	btu	gpm	gallons
47.5	708	-	8,230	5,826,840	7.00	297,360
42.5	756	-	24,830	18,771,480	7.00	317,520
37.5	705	33.13	41,430	29,208,150	8.29	350,498
32.5	546	-	58,030	31,684,380	11.61	380,213
27.5	340	-	74,630	25,374,200	14.93	304,490
22.5	229	-	91,230	20,891,670	18.25	250,700
17.5	133	-	107,830	14,341,390	21.57	172,097
12.5	57	-	124,430	7,092,510	24.89	85,110
7.5	22	-	141,030	3,102,660	28.21	37,232
2.5	9	-	157,630	1,418,670	31.53	17,024
-2.5	2	165.93	174,230	348,460	34.85	4,182
-7.5	1	-	190,830	190,830	38.17	2,290
Total	3,508			158,251,240		2,218,715
				1,583	Therms	

APPENDIX F

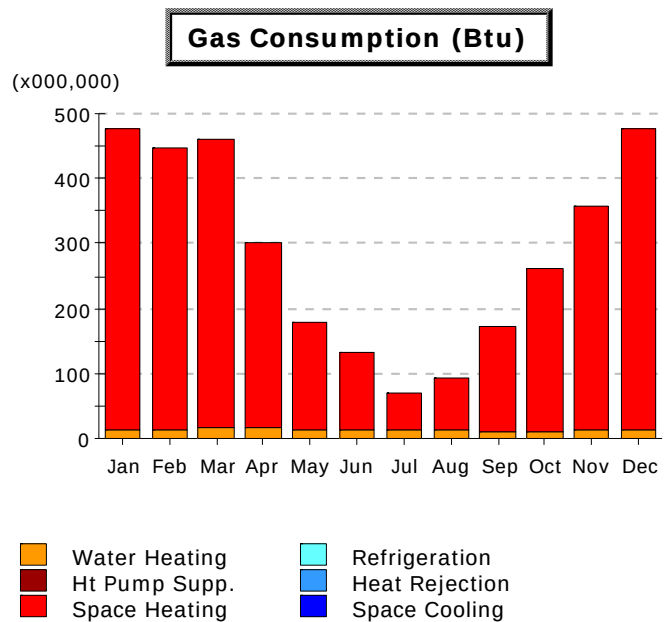
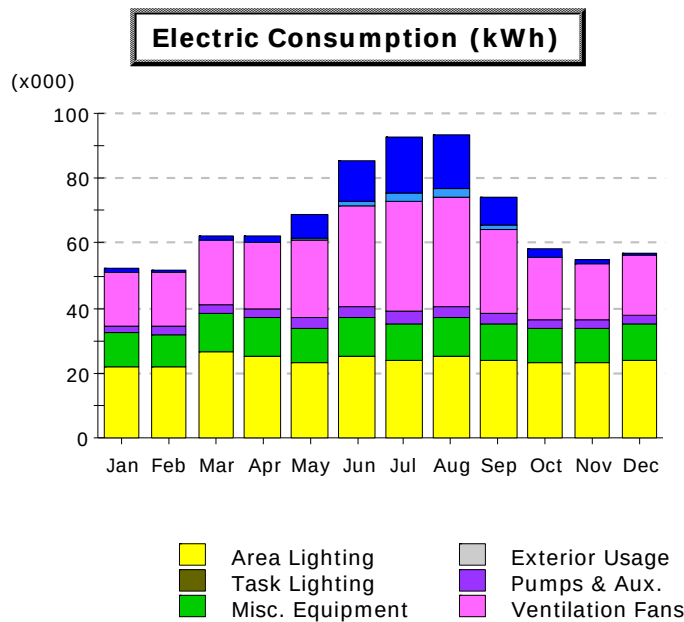
eQUEST Model Run Summaries

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.92	0.93	1.17	1.96	8.20	14.40	20.56	19.50	10.11	2.68	1.55	1.04	83.03
Heat Reject.	-	-	-	0.08	0.90	1.75	2.62	2.51	1.24	0.22	0.08	-	9.40
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	16.66	16.52	19.84	20.62	23.96	30.91	33.70	33.49	25.93	19.13	17.54	18.13	276.44
Pumps & Aux.	2.41	2.41	2.93	2.93	3.16	3.70	3.78	3.88	3.39	2.71	2.62	2.67	36.59
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	10.29	10.12	12.08	11.57	10.74	11.57	11.18	11.64	11.13	10.74	10.67	11.18	132.91
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	21.96	21.85	26.34	25.20	23.06	25.21	24.14	25.25	24.11	23.05	23.01	24.15	287.33
Total	52.24	51.83	62.37	62.36	70.03	87.54	95.98	96.27	75.91	58.53	55.48	57.17	825.70

Gas Consumption (Btu x000,000)

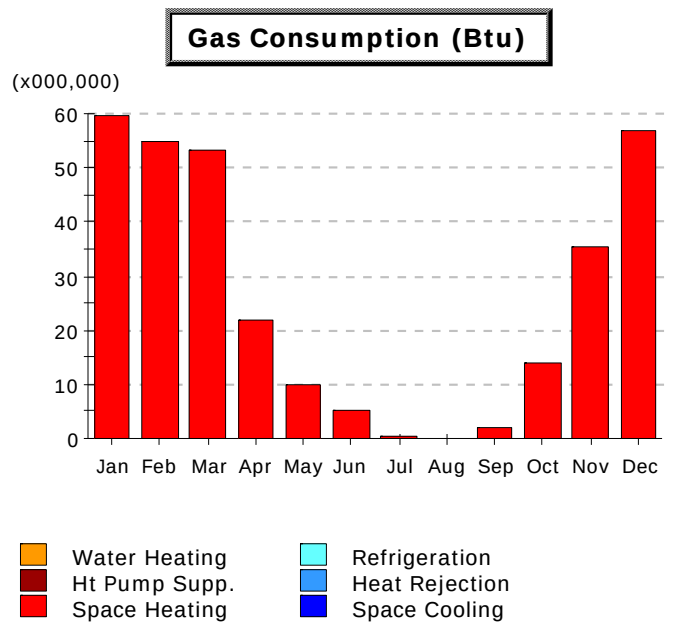
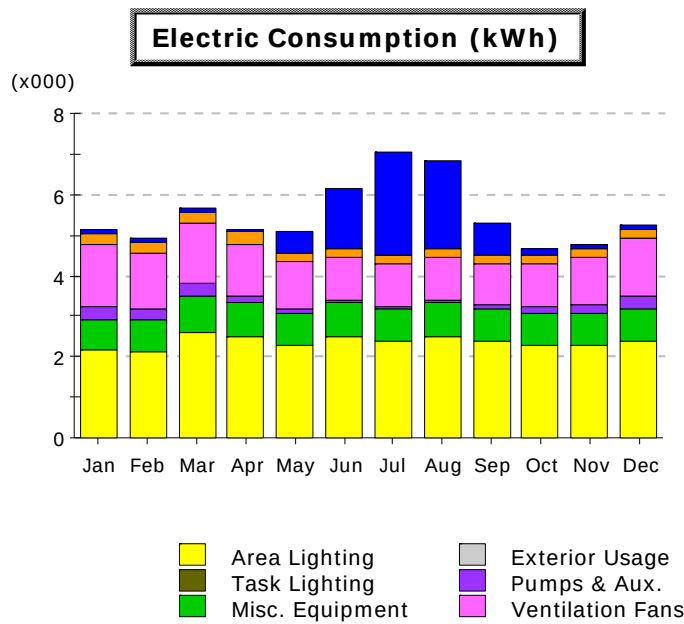
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	462.8	431.9	444.4	283.9	166.1	119.7	58.0	80.8	160.8	250.6	346.1	464.3	3,269.5
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	13.7	14.1	17.0	15.9	13.5	13.5	11.9	11.8	11.3	11.3	12.2	13.9	160.0
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	476.4	445.9	461.3	299.8	179.6	133.2	70.0	92.6	172.1	261.9	358.3	478.3	3,429.5

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.79	0.80	1.01	1.68	7.05	12.39	17.70	16.78	8.70	2.30	1.33	0.89	71.41
Heat Reject.	-	-	-	0.08	0.88	1.71	2.55	2.44	1.21	0.21	0.08	-	9.15
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	16.66	16.52	19.84	20.62	23.96	30.91	33.70	33.49	25.93	19.13	17.54	18.13	276.44
Pumps & Aux.	2.38	2.38	2.90	2.90	3.12	3.64	3.72	3.82	3.34	2.68	2.59	2.64	36.11
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	10.29	10.12	12.08	11.57	10.74	11.57	11.18	11.64	11.13	10.74	10.67	11.18	132.91
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	21.96	21.85	26.34	25.20	23.06	25.21	24.14	25.25	24.11	23.05	23.01	24.15	287.33
Total	52.09	51.67	62.17	62.04	68.81	85.43	92.99	93.42	74.41	58.12	55.22	56.99	813.36

Gas Consumption (Btu x000,000)

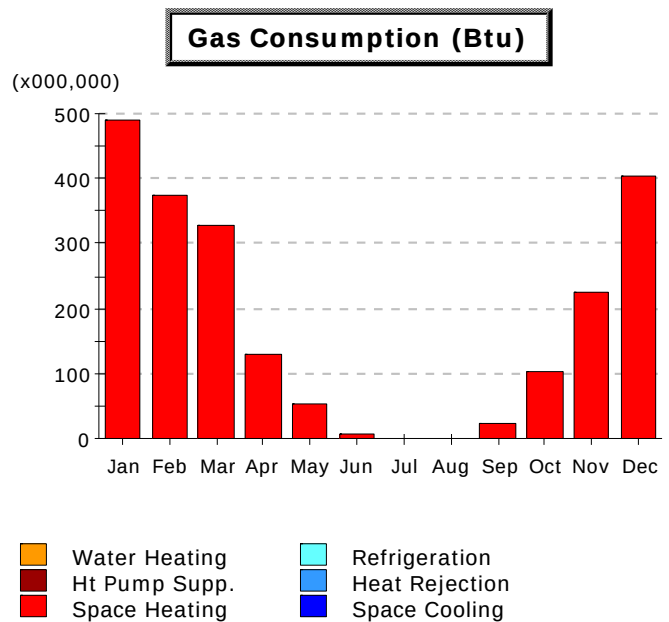
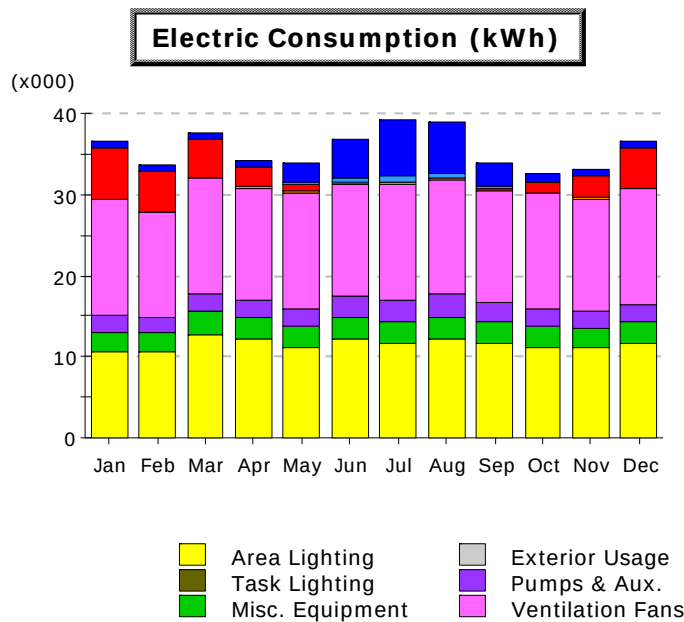
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	462.8	431.9	444.4	283.9	166.1	119.7	58.0	80.8	160.8	250.6	346.1	464.3	3,269.4
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	13.7	14.1	17.0	15.9	13.5	13.5	11.9	11.8	11.3	11.3	12.2	13.9	160.0
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	476.4	445.9	461.3	299.8	179.6	133.2	70.0	92.6	172.1	261.9	358.3	478.3	3,429.5

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.10	0.09	0.09	0.09	0.54	1.45	2.53	2.15	0.79	0.17	0.08	0.09	8.18
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.24	0.24	0.29	0.27	0.23	0.23	0.20	0.20	0.19	0.20	0.21	0.24	2.74
Vent. Fans	1.56	1.40	1.50	1.29	1.18	1.05	1.06	1.07	1.04	1.08	1.17	1.40	14.79
Pumps & Aux.	0.31	0.28	0.31	0.17	0.10	0.06	0.06	0.06	0.08	0.16	0.24	0.31	2.13
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.77	0.76	0.90	0.86	0.80	0.86	0.83	0.87	0.83	0.80	0.80	0.84	9.93
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	2.15	2.14	2.58	2.47	2.26	2.47	2.37	2.47	2.36	2.26	2.25	2.37	28.15
Total	5.12	4.91	5.66	5.15	5.11	6.13	7.05	6.83	5.30	4.67	4.76	5.24	65.93

Gas Consumption (Btu x000,000)

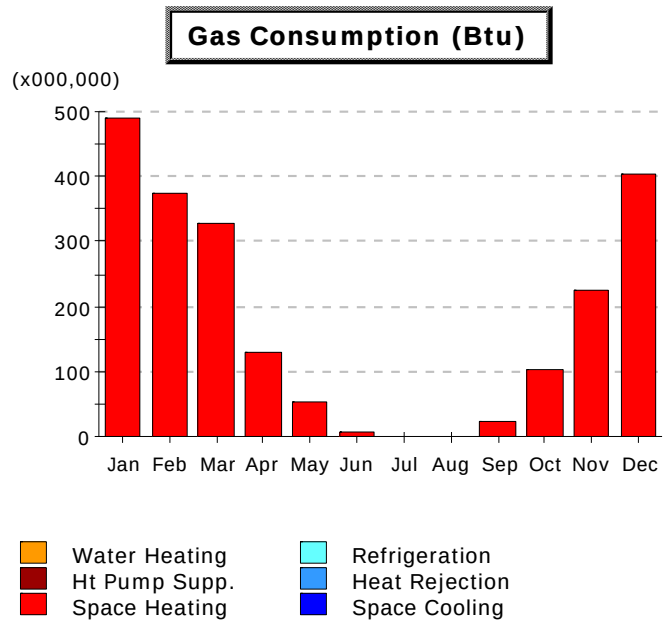
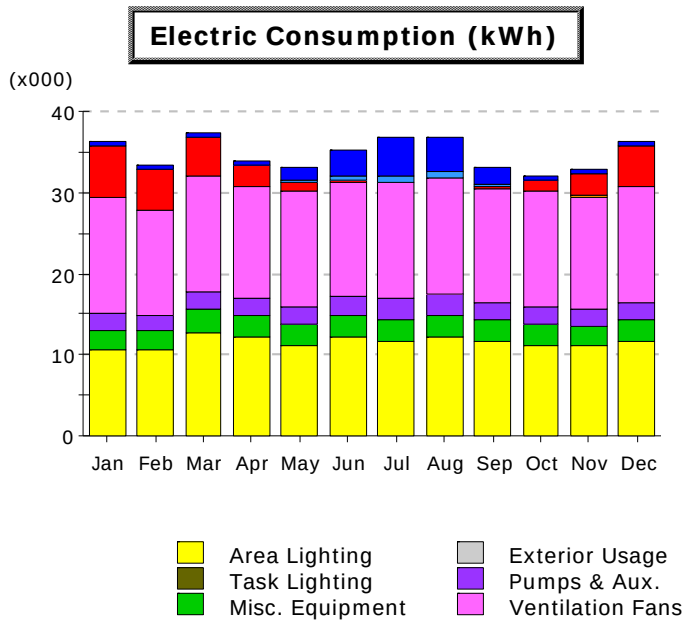
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	59.45	54.95	53.19	22.05	9.76	5.24	0.56	-	2.04	14.04	35.43	56.85	313.56
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	59.45	54.95	53.19	22.05	9.76	5.24	0.56	-	2.04	14.04	35.43	56.85	313.56

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.76	0.69	0.76	0.89	2.33	4.64	7.02	6.20	2.95	1.10	0.77	0.76	28.86
Heat Reject.	-	-	-	0.01	0.15	0.49	0.86	0.73	0.27	0.03	0.00	-	2.53
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	6.18	5.01	4.74	2.41	0.99	0.33	-	0.02	0.31	1.25	2.82	4.94	29.00
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.09	0.09	0.10	0.10	0.08	0.08	0.07	0.07	0.07	0.07	0.08	0.09	0.97
Vent. Fans	14.28	12.90	14.28	13.82	14.28	13.82	14.28	14.28	13.82	14.28	13.82	14.28	168.11
Pumps & Aux.	2.13	1.92	2.13	2.08	2.34	2.50	2.74	2.68	2.34	2.18	2.06	2.13	27.24
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.45	2.41	2.88	2.75	2.56	2.76	2.66	2.77	2.65	2.56	2.54	2.66	31.66
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	10.59	10.53	12.70	12.15	11.12	12.15	11.64	12.17	11.63	11.12	11.10	11.64	138.54
Total	36.47	33.54	37.58	34.22	33.84	36.76	39.28	38.91	34.03	32.58	33.19	36.50	426.90

Gas Consumption (Btu x000,000)

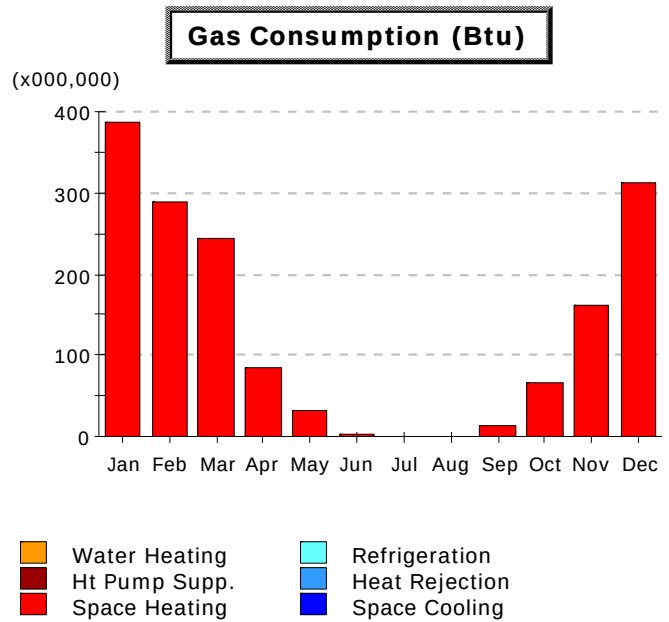
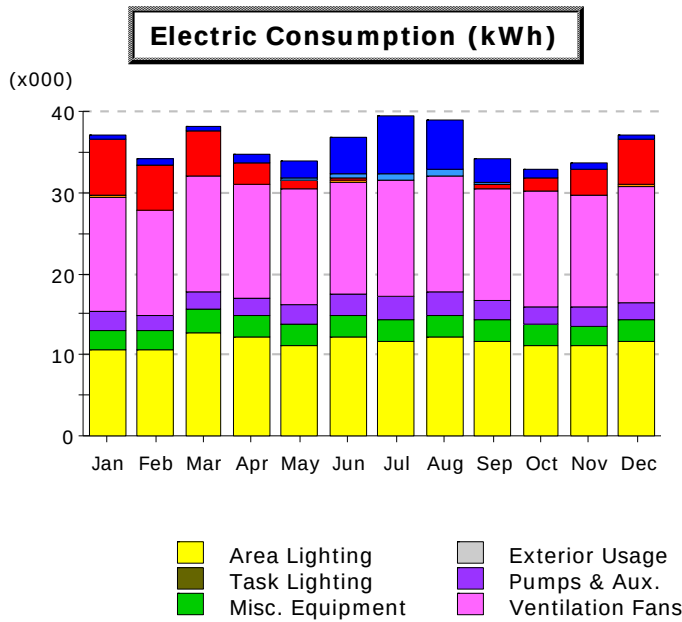
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	489.6	374.4	327.8	129.4	53.9	5.5	-	-	23.3	102.1	226.5	404.9	2,137.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	489.6	374.4	327.8	129.4	53.9	5.5	-	-	23.3	102.1	226.5	404.9	2,137.3

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.51	0.46	0.51	0.60	1.57	3.13	4.73	4.18	1.99	0.74	0.52	0.51	19.46
Heat Reject.	-	-	-	0.01	0.13	0.45	0.79	0.67	0.25	0.03	0.00	-	2.33
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	6.18	5.01	4.74	2.41	0.99	0.33	-	0.02	0.31	1.25	2.82	4.94	29.00
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.09	0.09	0.10	0.10	0.08	0.08	0.07	0.07	0.07	0.07	0.08	0.09	0.97
Vent. Fans	14.28	12.90	14.28	13.82	14.28	13.82	14.28	14.28	13.82	14.28	13.82	14.28	168.11
Pumps & Aux.	2.08	1.88	2.08	2.04	2.28	2.43	2.65	2.60	2.28	2.13	2.02	2.08	26.56
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.45	2.41	2.88	2.75	2.56	2.76	2.66	2.77	2.65	2.56	2.54	2.66	31.66
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	10.59	10.53	12.70	12.15	11.12	12.15	11.64	12.17	11.63	11.12	11.10	11.64	138.54
Total	36.18	33.28	37.29	33.88	33.01	35.14	36.83	36.75	32.99	32.17	32.90	36.21	416.62

Gas Consumption (Btu x000,000)

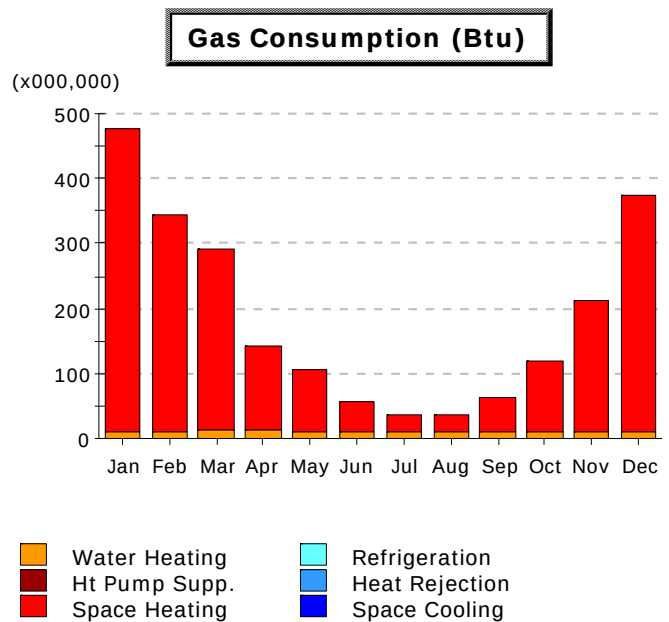
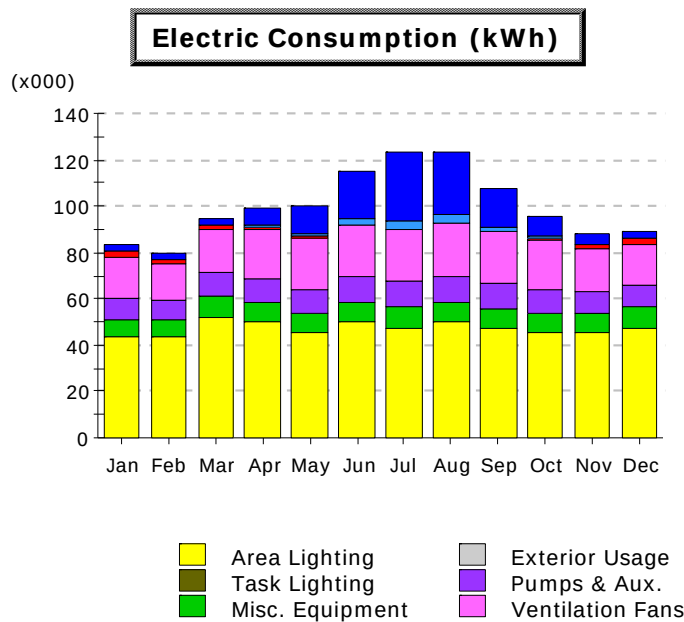
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	489.6	374.4	327.8	129.4	53.9	5.5	-	-	23.3	102.1	226.5	404.9	2,137.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	489.6	374.4	327.8	129.4	53.9	5.5	-	-	23.3	102.1	226.5	404.9	2,137.3

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.76	0.69	0.76	0.89	2.33	4.64	7.02	6.20	2.95	1.10	0.77	0.76	28.86
Heat Reject.	-	-	-	0.01	0.15	0.49	0.86	0.73	0.27	0.03	0.00	-	2.53
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	6.83	5.59	5.32	2.69	1.09	0.34	-	0.02	0.36	1.47	3.26	5.56	32.52
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.09	0.09	0.10	0.10	0.08	0.08	0.07	0.07	0.07	0.07	0.08	0.09	0.97
Vent. Fans	14.28	12.90	14.28	13.82	14.28	13.82	14.28	14.28	13.82	14.28	13.82	14.28	168.11
Pumps & Aux.	2.21	2.00	2.21	2.17	2.43	2.59	2.83	2.76	2.42	2.26	2.15	2.21	28.23
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.45	2.41	2.88	2.75	2.56	2.76	2.66	2.77	2.65	2.56	2.54	2.66	31.66
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	10.59	10.53	12.70	12.15	11.12	12.15	11.64	12.17	11.63	11.12	11.10	11.64	138.54
Total	37.21	34.19	38.25	34.57	34.03	36.85	39.36	38.99	34.16	32.88	33.72	37.20	431.42

Gas Consumption (Btu x000,000)

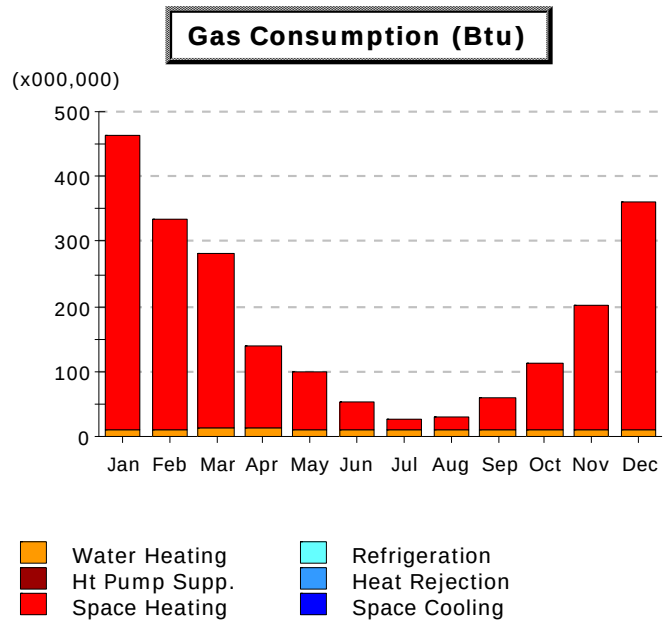
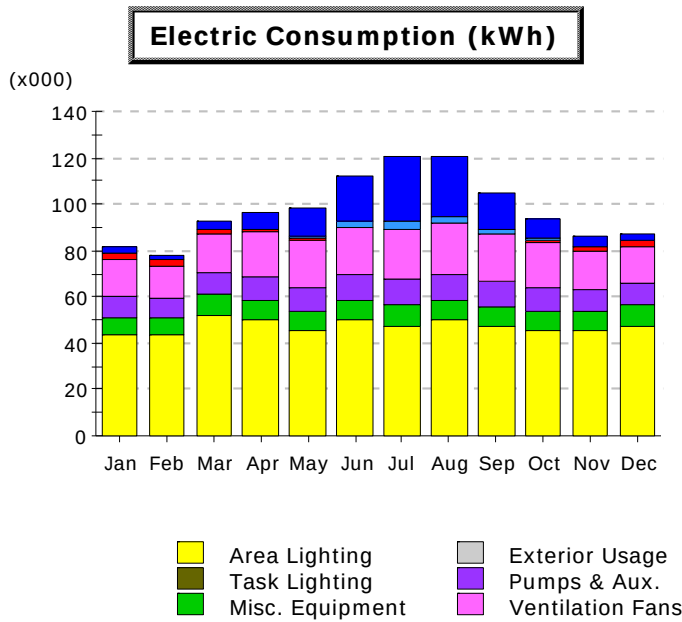
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	386.0	288.4	244.1	83.5	31.5	2.8	-	-	13.8	65.3	162.2	311.7	1,589.4
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	386.0	288.4	244.1	83.5	31.5	2.8	-	-	13.8	65.3	162.2	311.7	1,589.4

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	2.7	2.6	3.5	7.5	12.6	20.6	29.4	26.8	16.3	8.4	4.8	3.1	138.3
Heat Reject.	0.0	0.0	0.0	0.4	1.1	2.5	4.1	3.6	1.8	0.6	0.2	0.0	14.4
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	2.6	2.0	1.9	0.8	0.3	0.1	-	0.0	0.2	0.7	1.4	2.2	12.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	17.2	15.9	18.6	21.6	22.2	22.3	22.2	22.9	22.3	21.6	18.7	17.8	243.3
Pumps & Aux.	9.5	8.6	9.7	10.0	10.6	10.7	11.3	11.3	10.5	10.4	9.6	9.6	121.8
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	7.8	7.7	9.2	8.8	8.2	8.8	8.5	8.8	8.5	8.2	8.1	8.5	101.0
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	43.4	43.1	52.0	49.8	45.5	49.8	47.7	49.9	47.6	45.5	45.4	47.7	567.4
Total	83.1	80.0	94.9	98.8	100.5	114.8	123.2	123.2	107.2	95.4	88.2	88.9	1,198.4

Gas Consumption (Btu x000,000)

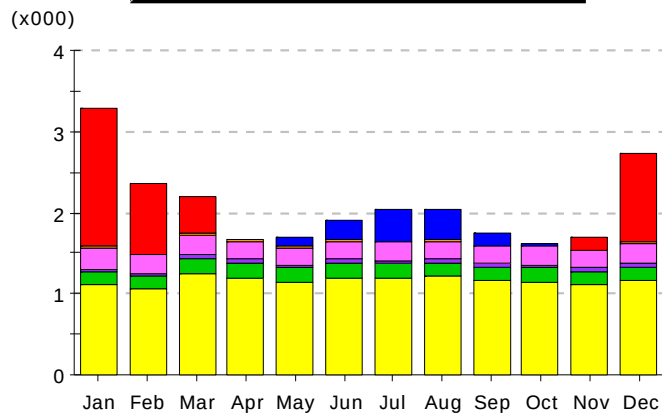
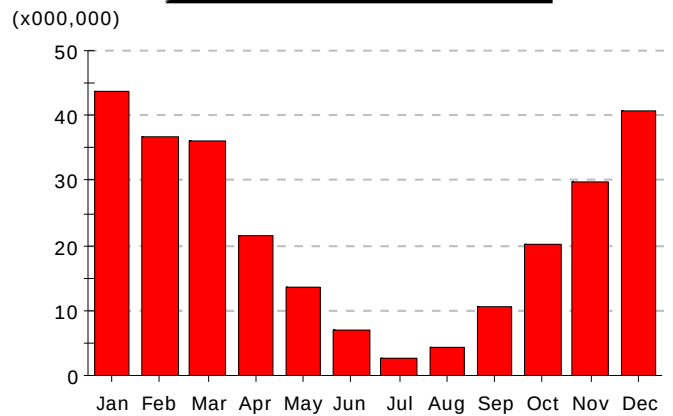
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	466.7	334.1	278.1	131.6	95.3	46.1	25.7	28.0	54.2	110.8	202.5	363.2	2,136.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	10.6	10.9	13.1	12.3	10.5	10.5	9.4	9.3	8.8	8.9	9.6	10.9	124.8
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	477.3	345.0	291.3	143.9	105.8	56.6	35.1	37.3	63.0	119.7	212.1	374.1	2,261.1

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	2.6	2.5	3.3	7.2	12.1	19.7	28.1	25.6	15.6	8.1	4.5	2.9	132.3
Heat Reject.	0.0	0.0	0.0	0.4	1.0	2.4	3.9	3.4	1.7	0.6	0.2	0.0	13.7
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	2.6	2.0	1.9	0.8	0.3	0.1	-	0.0	0.2	0.7	1.4	2.2	12.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	15.3	14.2	16.7	19.8	20.6	21.1	21.1	21.7	20.8	19.9	16.8	15.9	223.8
Pumps & Aux.	9.4	8.6	9.7	9.9	10.5	10.6	11.3	11.2	10.4	10.2	9.5	9.5	120.8
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	7.8	7.7	9.2	8.8	8.2	8.8	8.5	8.8	8.5	8.2	8.1	8.5	101.0
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	43.4	43.1	52.0	49.8	45.5	49.8	47.7	49.9	47.6	45.5	45.4	47.7	567.4
Total	81.1	78.1	92.7	96.6	98.3	112.4	120.5	120.6	104.8	93.2	85.9	86.9	1,171.2

Gas Consumption (Btu x000,000)

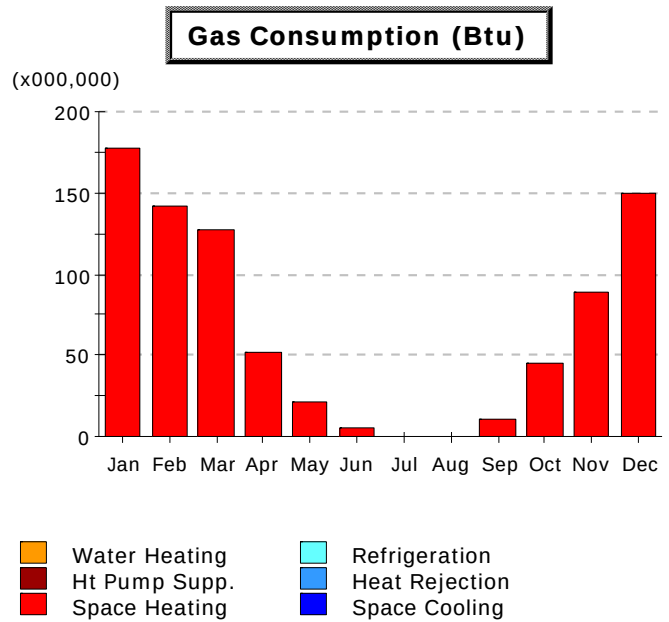
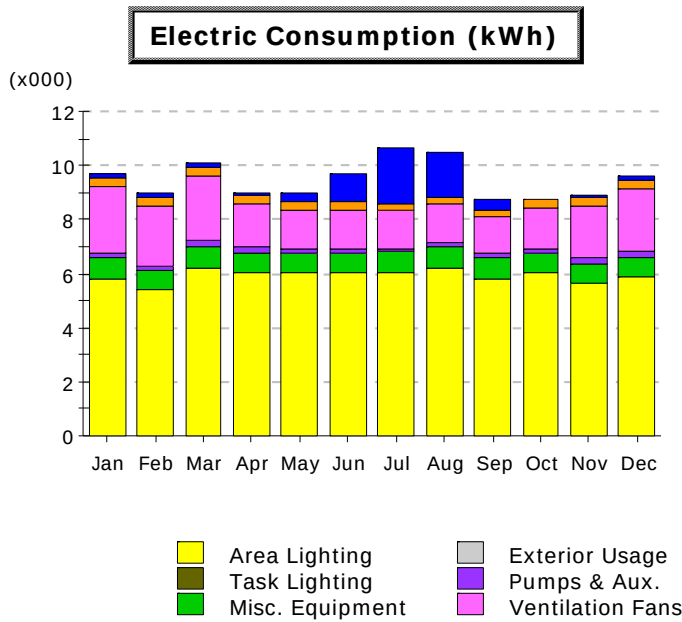
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	452.7	323.9	268.2	126.7	90.5	41.2	17.1	19.9	49.2	104.6	193.6	350.8	2,038.4
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	10.6	10.9	13.1	12.3	10.5	10.5	9.4	9.3	8.8	8.9	9.6	10.9	124.8
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	463.3	334.8	281.3	139.0	101.0	51.7	26.5	29.2	58.0	113.5	203.2	361.6	2,163.1

Electric Consumption (kWh)**Gas Consumption (Btu)****Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.01	0.10	0.25	0.40	0.38	0.16	0.03	0.00	-	1.34
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.70	0.87	0.46	0.00	-	-	-	-	-	-	0.15	1.09	4.27
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.24
Vent. Fans	0.26	0.22	0.24	0.22	0.22	0.22	0.22	0.23	0.21	0.22	0.21	0.24	2.72
Pumps & Aux.	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.52
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.16	0.15	0.18	0.17	0.16	0.17	0.17	0.17	0.16	0.16	0.16	0.16	1.98
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	1.10	1.06	1.25	1.21	1.15	1.21	1.20	1.21	1.16	1.15	1.11	1.16	13.97
Total	3.29	2.37	2.20	1.67	1.70	1.91	2.05	2.05	1.75	1.63	1.70	2.73	25.03

Gas Consumption (Btu x000,000)

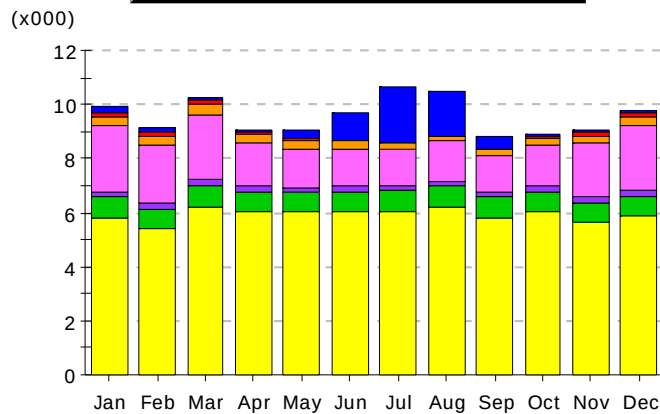
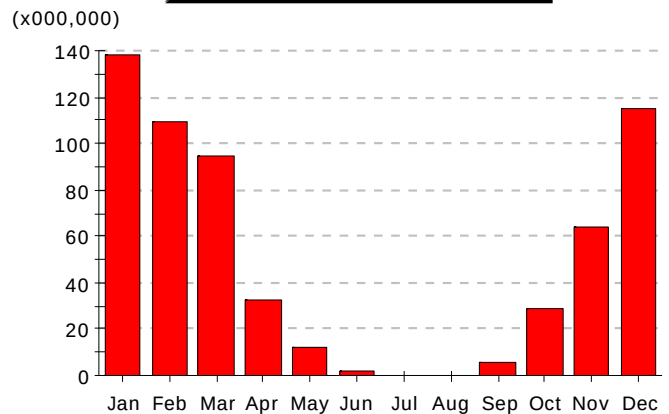
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	43.81	36.68	36.02	21.58	13.74	7.01	2.77	4.42	10.46	20.14	29.85	40.78	267.24
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	43.81	36.68	36.02	21.58	13.74	7.01	2.77	4.42	10.46	20.14	29.85	40.78	267.24

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.17	0.12	0.10	0.04	0.31	1.06	2.02	1.65	0.43	0.07	0.07	0.13	6.17
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.34	0.33	0.37	0.35	0.32	0.28	0.25	0.23	0.22	0.26	0.27	0.31	3.53
Vent. Fans	2.43	2.18	2.35	1.59	1.43	1.41	1.41	1.46	1.37	1.51	1.98	2.36	21.48
Pumps & Aux.	0.20	0.19	0.21	0.17	0.15	0.14	0.14	0.15	0.14	0.17	0.18	0.20	2.04
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.74	0.70	0.82	0.79	0.76	0.79	0.78	0.81	0.77	0.76	0.74	0.77	9.24
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	5.83	5.42	6.20	6.00	6.01	6.00	6.02	6.20	5.82	6.01	5.64	5.84	71.00
Total	9.71	8.95	10.06	8.94	8.99	9.68	10.61	10.49	8.76	8.78	8.88	9.62	113.46

Gas Consumption (Btu x000,000)

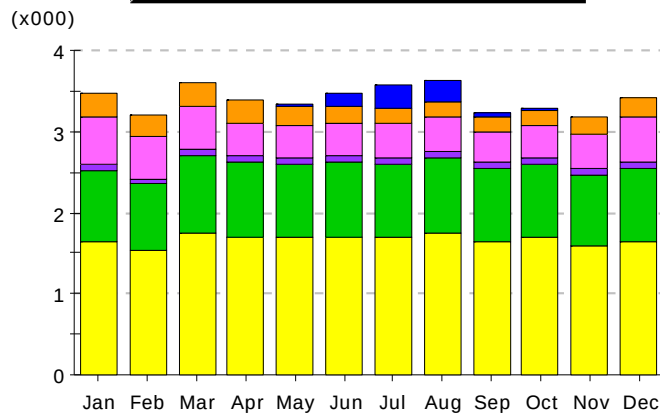
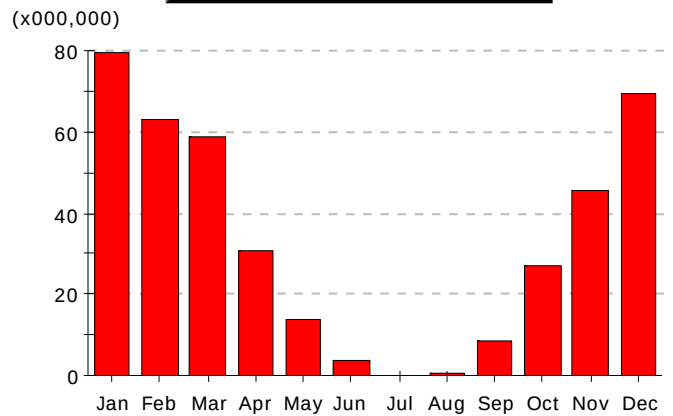
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	177.16	142.37	127.38	51.07	21.76	4.65	-	-	10.58	45.26	89.10	149.98	819.31
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	177.16	142.37	127.38	51.07	21.76	4.65	-	-	10.58	45.26	89.10	149.98	819.31

Electric Consumption (kWh)**Gas Consumption (Btu)****Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.17	0.12	0.10	0.04	0.31	1.06	2.02	1.65	0.43	0.07	0.07	0.13	6.17
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.17	0.16	0.17	0.10	0.04	0.01	-	-	0.02	0.09	0.13	0.17	1.05
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.34	0.33	0.37	0.35	0.32	0.28	0.25	0.23	0.22	0.26	0.27	0.31	3.53
Vent. Fans	2.43	2.18	2.35	1.59	1.43	1.41	1.41	1.46	1.37	1.51	1.98	2.36	21.48
Pumps & Aux.	0.22	0.20	0.23	0.19	0.17	0.16	0.16	0.16	0.16	0.19	0.20	0.22	2.25
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.74	0.70	0.82	0.79	0.76	0.79	0.78	0.81	0.77	0.76	0.74	0.77	9.24
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	5.83	5.42	6.20	6.00	6.01	6.00	6.02	6.20	5.82	6.01	5.64	5.84	71.00
Total	9.90	9.12	10.25	9.06	9.04	9.70	10.63	10.51	8.79	8.88	9.03	9.80	114.71

Gas Consumption (Btu x000,000)

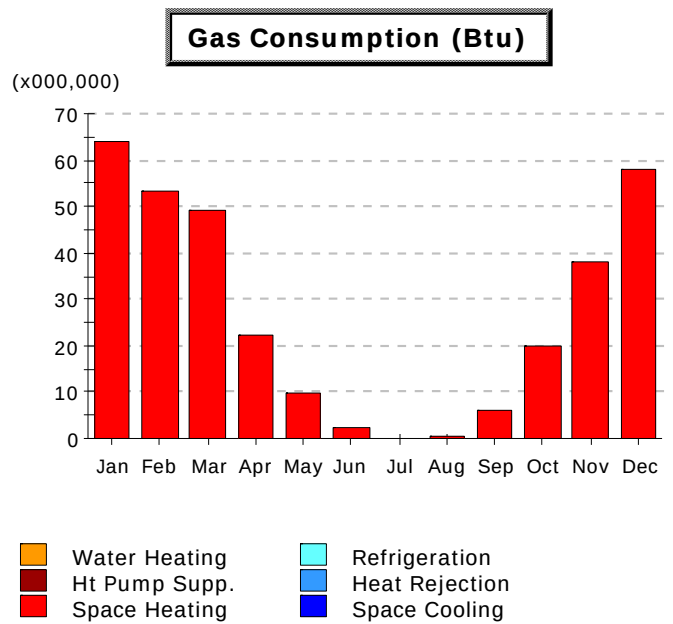
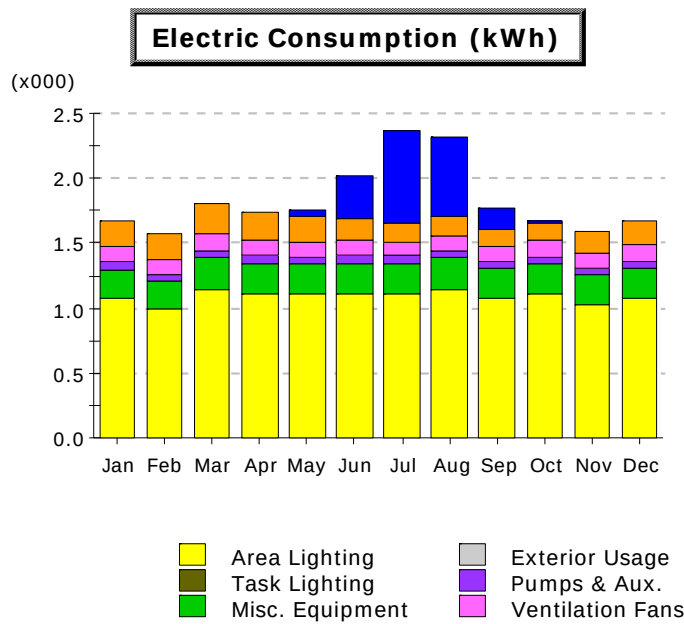
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	138.35	109.49	94.68	32.25	11.62	1.89	-	-	5.62	28.44	63.95	115.01	601.30
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	138.35	109.49	94.68	32.25	11.62	1.89	-	-	5.62	28.44	63.95	115.01	601.30

Electric Consumption (kWh)**Gas Consumption (Btu)****Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	0.02	0.15	0.30	0.27	0.06	0.00	-	-	0.80
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.28	0.27	0.31	0.29	0.26	0.23	0.20	0.19	0.18	0.20	0.22	0.25	2.87
Vent. Fans	0.60	0.51	0.52	0.40	0.40	0.40	0.40	0.42	0.38	0.40	0.43	0.55	5.40
Pumps & Aux.	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	1.00
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.86	0.82	0.96	0.93	0.89	0.93	0.91	0.94	0.89	0.89	0.86	0.90	10.79
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	1.64	1.52	1.74	1.68	1.69	1.68	1.69	1.74	1.64	1.69	1.59	1.64	19.96
Total	3.47	3.20	3.61	3.38	3.34	3.47	3.59	3.64	3.24	3.28	3.18	3.43	40.82

Gas Consumption (Btu x000,000)

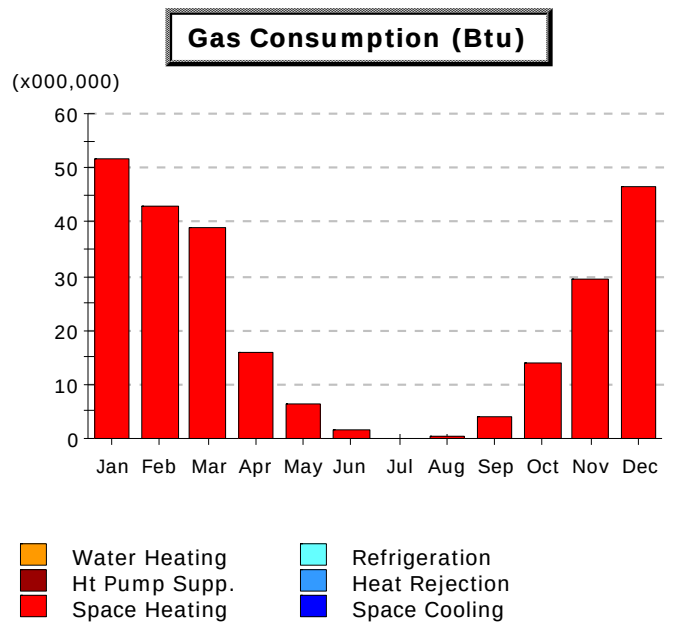
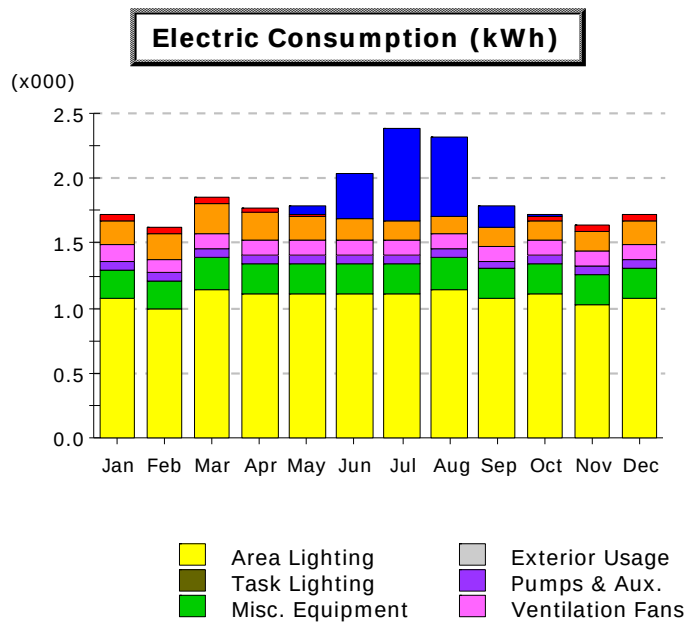
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	79.27	62.92	58.76	30.76	13.94	3.84	0.19	0.53	8.50	27.09	45.44	69.32	400.56
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	79.27	62.92	58.76	30.76	13.94	3.84	0.19	0.53	8.50	27.09	45.44	69.32	400.56

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	0.05	0.34	0.71	0.61	0.16	0.02	-	-	1.90
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.19	0.19	0.23	0.21	0.18	0.17	0.15	0.14	0.14	0.15	0.16	0.18	2.09
Vent. Fans	0.12	0.11	0.12	0.12	0.12	0.12	0.11	0.12	0.12	0.12	0.12	0.12	1.43
Pumps & Aux.	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.68
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.22	0.21	0.25	0.24	0.23	0.24	0.24	0.25	0.23	0.23	0.22	0.23	2.80
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	1.07	0.99	1.14	1.10	1.10	1.10	1.11	1.14	1.07	1.10	1.03	1.07	13.04
Total	1.67	1.56	1.80	1.73	1.75	2.03	2.37	2.31	1.77	1.68	1.59	1.67	21.93

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	64.10	53.26	49.16	22.28	9.54	2.51	0.16	0.59	6.06	19.84	38.11	58.02	323.63
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	64.10	53.26	49.16	22.28	9.54	2.51	0.16	0.59	6.06	19.84	38.11	58.02	323.63

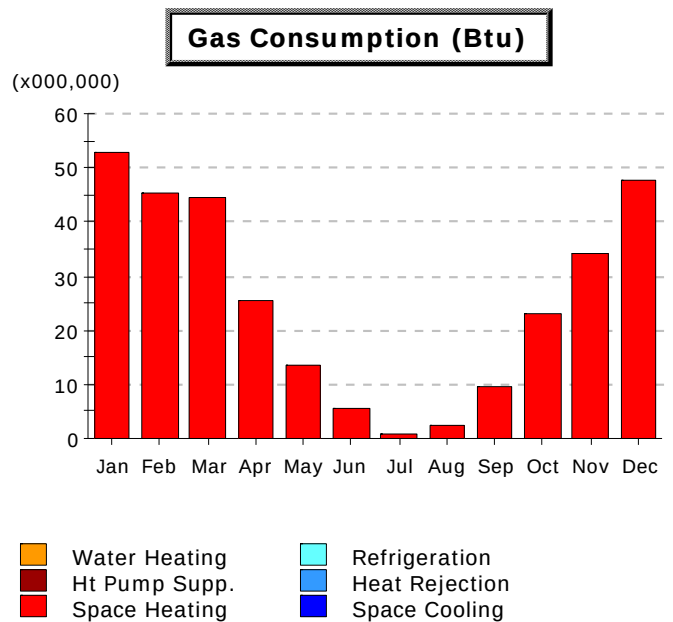
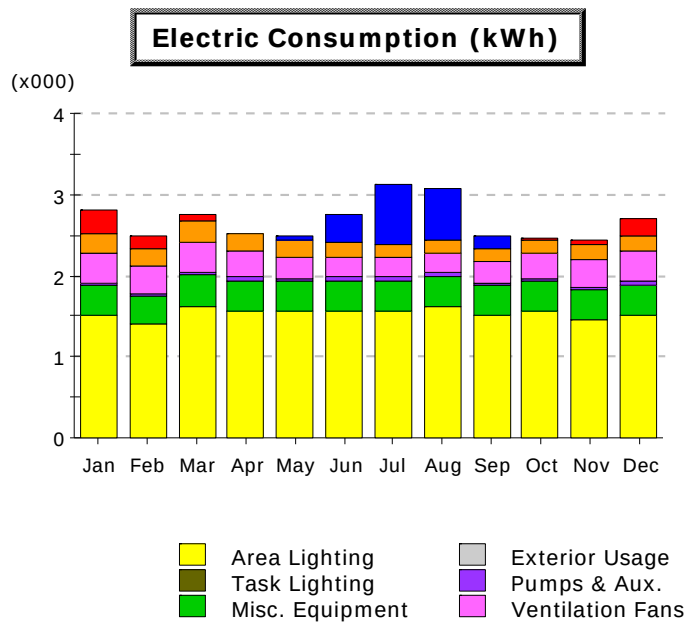


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	0.05	0.34	0.71	0.61	0.16	0.02	-	-	1.90
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.05	0.05	0.05	0.04	0.02	0.00	0.00	0.00	0.01	0.03	0.04	0.05	0.34
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.19	0.19	0.23	0.21	0.18	0.17	0.15	0.14	0.14	0.15	0.16	0.18	2.09
Vent. Fans	0.12	0.11	0.12	0.12	0.12	0.12	0.11	0.12	0.12	0.12	0.12	0.12	1.43
Pumps & Aux.	0.07	0.06	0.07	0.06	0.07	0.06	0.07	0.07	0.06	0.07	0.06	0.07	0.78
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.22	0.21	0.25	0.24	0.23	0.24	0.24	0.25	0.23	0.23	0.22	0.23	2.80
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	1.07	0.99	1.14	1.10	1.10	1.10	1.11	1.14	1.07	1.10	1.03	1.07	13.04
Total	1.73	1.62	1.86	1.78	1.78	2.04	2.38	2.32	1.79	1.72	1.64	1.73	22.37

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	51.76	42.73	38.79	16.05	6.23	1.44	0.07	0.27	3.80	14.08	29.47	46.49	251.18
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	51.76	42.73	38.79	16.05	6.23	1.44	0.07	0.27	3.80	14.08	29.47	46.49	251.18

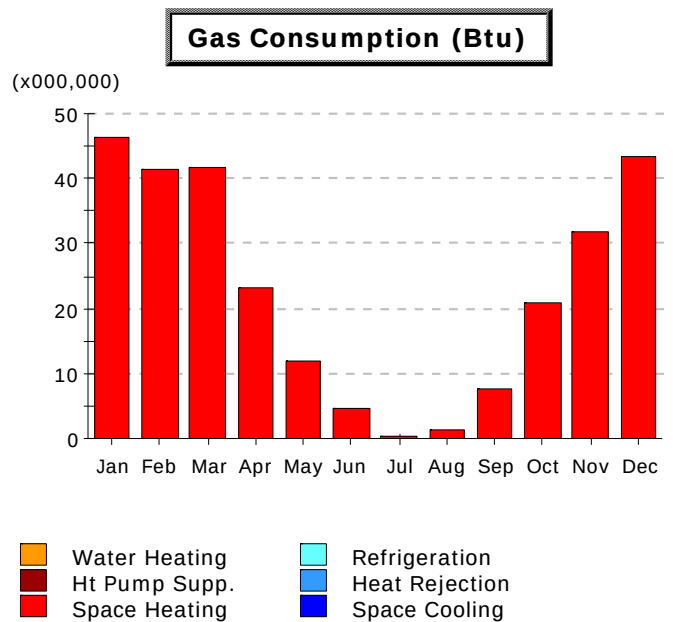
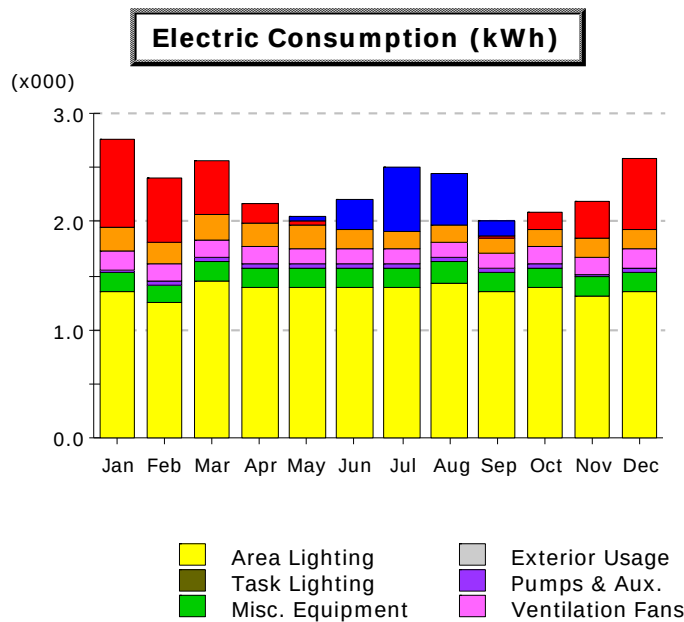


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	0.06	0.35	0.73	0.62	0.16	0.02	-	-	1.94
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.31	0.17	0.09	0.00	0.00	-	-	-	-	0.00	0.05	0.21	0.83
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.23	0.22	0.25	0.23	0.21	0.18	0.16	0.16	0.15	0.17	0.18	0.21	2.35
Vent. Fans	0.37	0.33	0.36	0.31	0.26	0.24	0.24	0.25	0.25	0.31	0.34	0.37	3.63
Pumps & Aux.	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.49
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.35	0.34	0.39	0.38	0.37	0.38	0.37	0.39	0.37	0.37	0.35	0.37	4.43
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	1.52	1.41	1.61	1.56	1.56	1.56	1.56	1.61	1.51	1.56	1.47	1.52	18.46
Total	2.82	2.50	2.75	2.53	2.50	2.76	3.12	3.07	2.48	2.47	2.43	2.71	32.13

Gas Consumption (Btu x000,000)

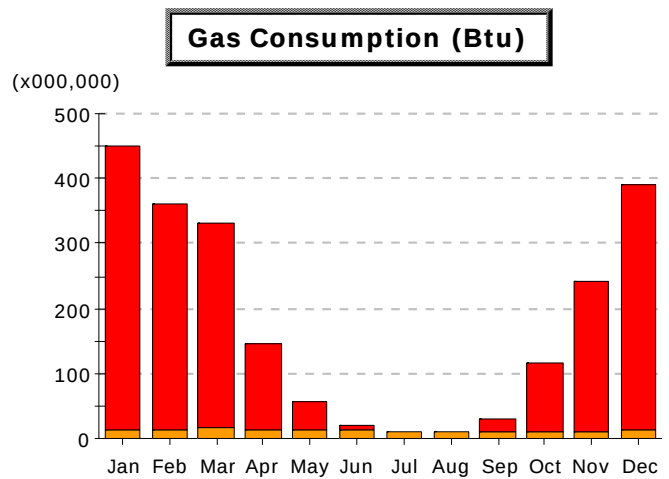
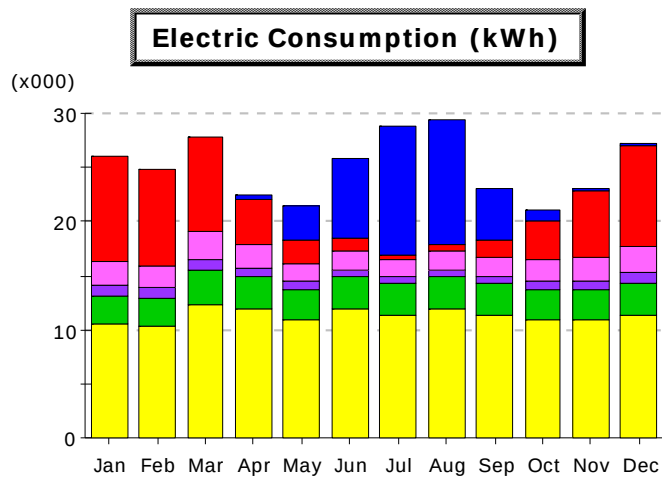
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	52.77	45.24	44.58	25.32	13.48	5.43	0.98	2.55	9.71	22.90	34.06	47.73	304.74
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	52.77	45.24	44.58	25.32	13.48	5.43	0.98	2.55	9.71	22.90	34.06	47.73	304.74

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	0.04	0.27	0.58	0.49	0.12	0.01	-	-	1.51
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.81	0.59	0.49	0.18	0.05	0.00	-	0.00	0.03	0.16	0.36	0.65	3.32
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.22	0.21	0.24	0.22	0.20	0.17	0.16	0.15	0.14	0.16	0.17	0.20	2.22
Vent. Fans	0.18	0.16	0.17	0.15	0.15	0.15	0.15	0.15	0.14	0.15	0.16	0.17	1.88
Pumps & Aux.	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.41
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.17	0.16	0.19	0.18	0.17	0.18	0.18	0.18	0.17	0.17	0.17	0.17	2.10
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	1.36	1.26	1.44	1.39	1.40	1.39	1.40	1.44	1.35	1.40	1.31	1.36	16.51
Total	2.76	2.41	2.55	2.16	2.05	2.20	2.50	2.45	2.00	2.09	2.20	2.59	27.95

Gas Consumption (Btu x000,000)

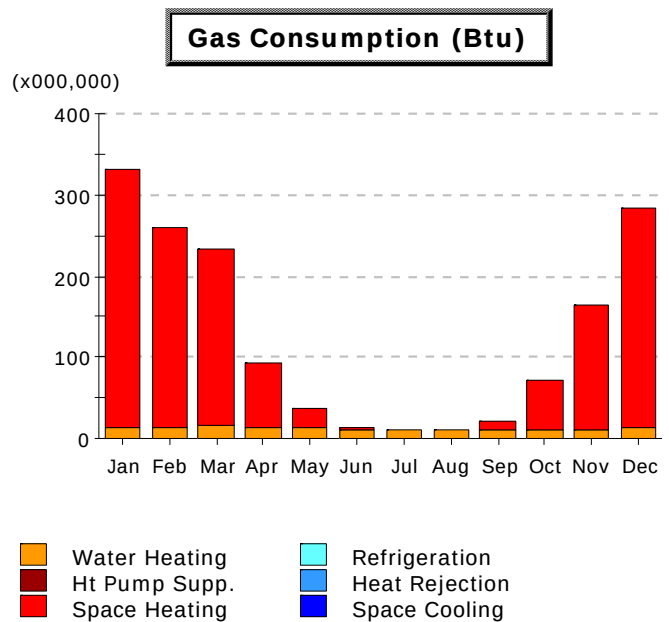
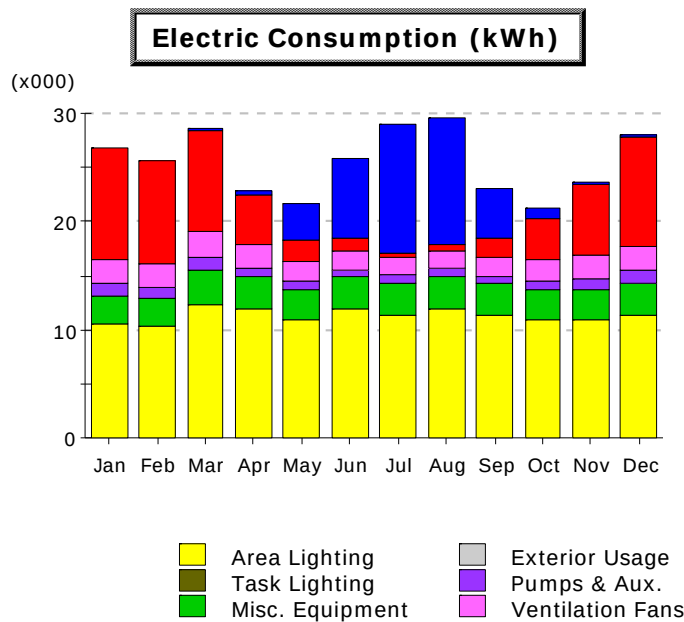
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	46.44	41.24	41.77	23.26	12.07	4.50	0.49	1.25	7.60	20.87	31.76	43.48	274.74
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	46.44	41.24	41.77	23.26	12.07	4.50	0.49	1.25	7.60	20.87	31.76	43.48	274.74

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.01	0.03	0.08	0.48	3.21	7.35	11.91	11.56	4.62	0.92	0.24	0.05	40.47
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	9.63	8.88	8.78	4.19	2.04	1.19	0.44	0.64	1.76	3.57	6.07	9.45	56.64
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.20	2.11	2.47	2.25	1.76	1.74	1.63	1.71	1.71	1.98	2.20	2.33	24.10
Pumps & Aux.	0.98	0.89	0.96	0.73	0.65	0.56	0.58	0.58	0.60	0.75	0.85	0.97	9.10
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.69	2.65	3.18	3.04	2.81	3.04	2.93	3.06	2.92	2.81	2.80	2.93	34.86
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	10.46	10.33	12.38	11.85	10.95	11.85	11.41	11.90	11.37	10.94	10.89	11.42	135.76
Total	25.97	24.89	27.84	22.55	21.42	25.75	28.90	29.44	22.99	20.97	23.06	27.15	300.93

Gas Consumption (Btu x000,000)

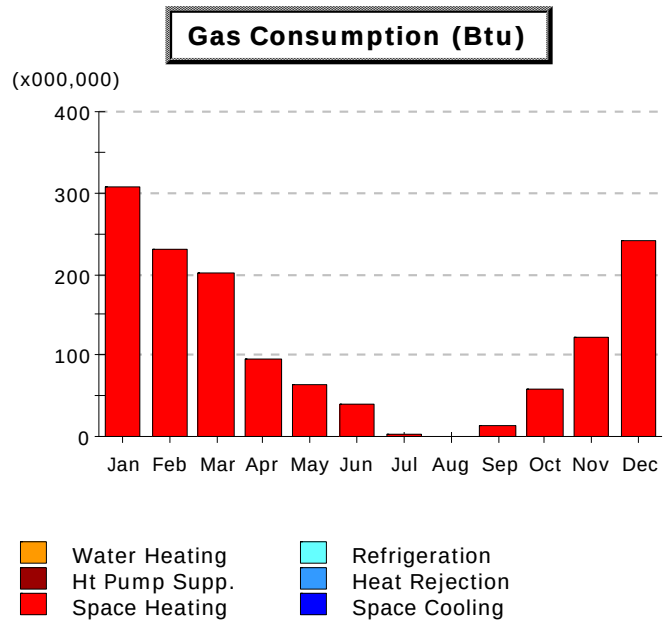
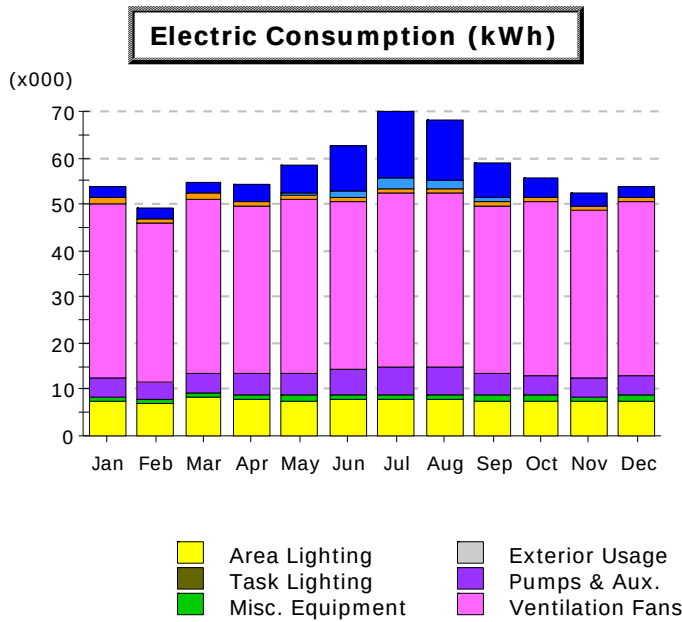
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	438.1	347.5	316.1	131.1	45.3	6.6	-	-	20.4	106.4	230.6	378.8	2,020.8
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	12.3	12.5	14.9	14.0	12.0	11.8	10.5	10.4	9.9	10.1	10.9	12.4	141.7
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	450.4	359.9	331.0	145.1	57.3	18.5	10.5	10.4	30.3	116.5	241.4	391.2	2,162.5

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.01	0.03	0.08	0.48	3.21	7.35	11.91	11.56	4.62	0.92	0.24	0.05	40.47
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	10.39	9.52	9.38	4.44	2.12	1.20	0.44	0.64	1.79	3.77	6.54	10.14	60.38
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.20	2.11	2.47	2.25	1.76	1.74	1.63	1.71	1.71	1.98	2.20	2.33	24.10
Pumps & Aux.	1.06	0.96	1.03	0.81	0.73	0.64	0.66	0.66	0.68	0.83	0.93	1.05	10.02
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.69	2.65	3.18	3.04	2.81	3.04	2.93	3.06	2.92	2.81	2.80	2.93	34.86
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	10.46	10.33	12.38	11.85	10.95	11.85	11.41	11.90	11.37	10.94	10.89	11.42	135.76
Total	26.81	25.60	28.52	22.87	21.58	25.83	28.98	29.52	23.10	21.26	23.60	27.92	305.59

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	318.0	247.8	219.4	78.7	24.2	2.7	-	-	10.4	62.5	154.1	269.9	1,387.9
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	12.3	12.5	14.9	14.0	12.0	11.8	10.5	10.4	9.9	10.1	10.9	12.4	141.7
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	330.3	260.3	234.3	92.7	36.2	14.5	10.5	10.4	20.4	72.6	165.0	282.3	1,529.5

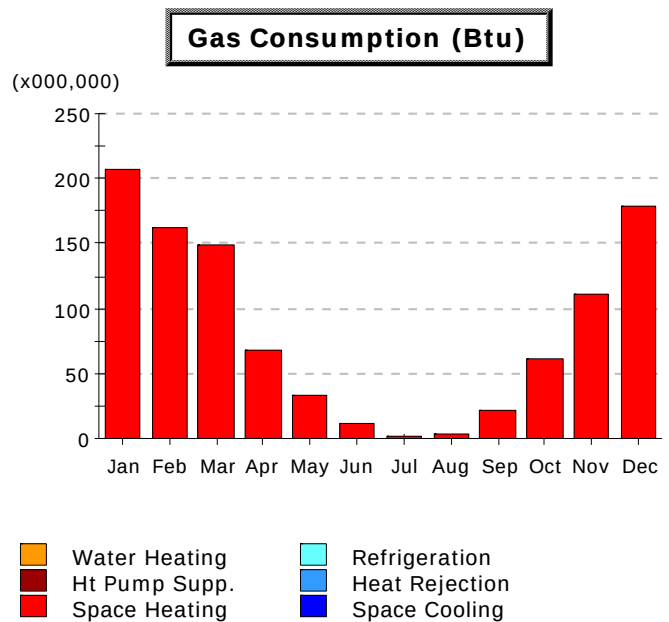
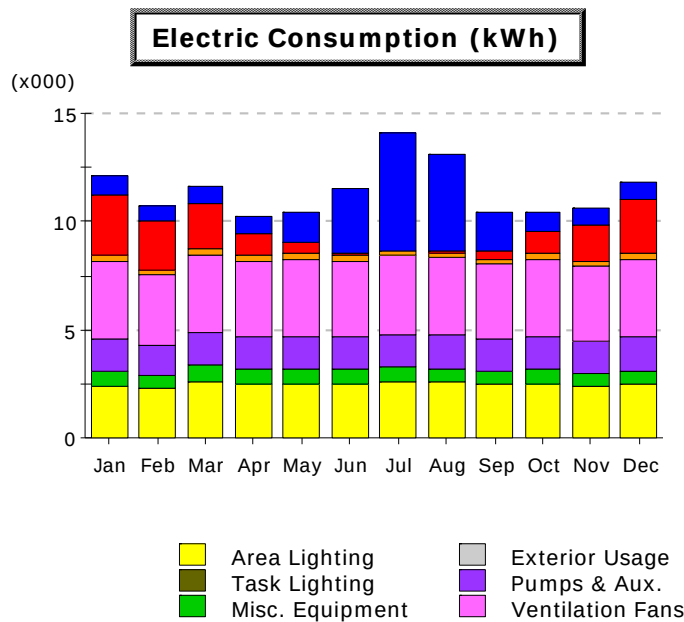


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	2.36	2.12	2.36	3.52	6.22	9.87	14.25	13.07	7.50	3.87	2.58	2.35	70.07
Heat Reject.	-	-	-	0.04	0.35	1.25	2.43	2.01	0.78	0.12	0.03	-	7.00
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	1.16	1.15	1.34	1.26	1.13	1.08	0.99	0.95	0.91	0.95	1.00	1.13	13.05
Vent. Fans	37.64	33.99	37.60	36.21	37.36	36.18	37.40	37.39	36.16	37.41	36.34	37.63	441.31
Pumps & Aux.	4.20	3.79	4.19	4.26	4.84	5.27	5.93	5.74	4.88	4.43	4.10	4.19	55.81
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.07	1.02	1.18	1.14	1.11	1.14	1.14	1.15	1.10	1.11	1.06	1.11	13.33
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.28	6.96	8.16	7.85	7.57	7.85	7.85	7.87	7.57	7.57	7.28	7.59	91.40
Total	53.71	49.03	54.82	54.28	58.57	62.62	70.00	68.18	58.91	55.45	52.40	54.00	691.97

Gas Consumption (Btu x000,000)

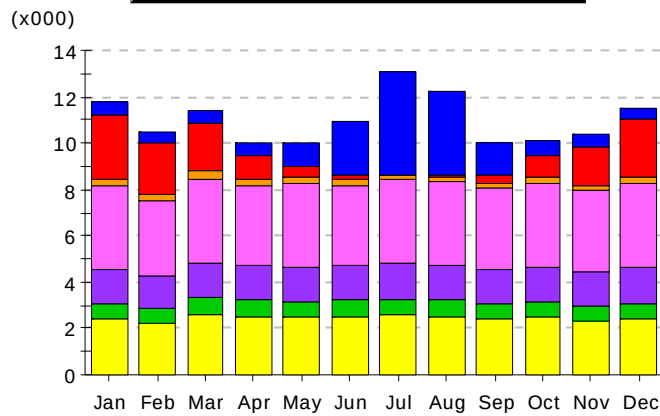
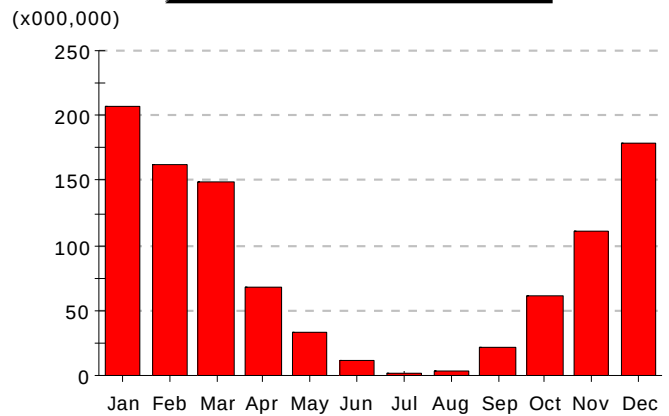
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	306.9	231.6	202.0	96.6	63.3	39.2	2.6	1.2	14.0	57.9	122.5	241.9	1,379.7
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	306.9	231.6	202.0	96.6	63.3	39.2	2.6	1.2	14.0	57.9	122.5	241.9	1,379.7

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.83	0.75	0.83	0.82	1.37	2.97	5.46	4.48	1.85	0.95	0.80	0.83	21.92
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	2.83	2.24	2.07	0.99	0.49	0.17	0.02	0.05	0.35	0.99	1.65	2.50	14.34
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.26	0.25	0.29	0.28	0.25	0.23	0.22	0.21	0.20	0.21	0.22	0.24	2.85
Vent. Fans	3.61	3.26	3.61	3.50	3.61	3.50	3.61	3.61	3.50	3.61	3.50	3.61	42.53
Pumps & Aux.	1.53	1.39	1.53	1.49	1.53	1.49	1.53	1.53	1.49	1.53	1.49	1.53	18.07
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.64	0.61	0.70	0.68	0.67	0.68	0.69	0.68	0.66	0.67	0.63	0.66	7.96
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	2.39	2.26	2.63	2.53	2.48	2.53	2.56	2.54	2.44	2.48	2.35	2.45	29.62
Total	12.09	10.75	11.66	10.27	10.40	11.56	14.09	13.10	10.48	10.44	10.63	11.82	137.28

Gas Consumption (Btu x000,000)

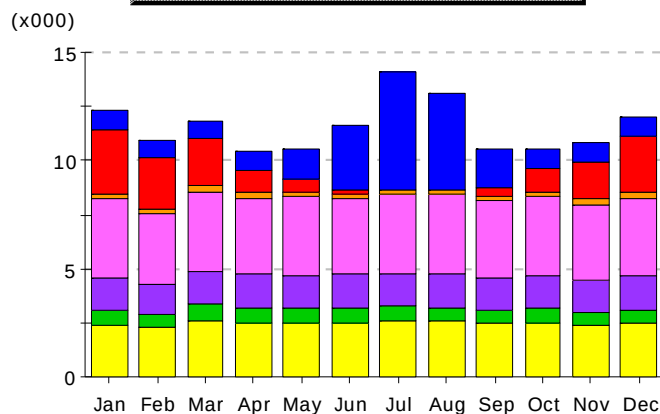
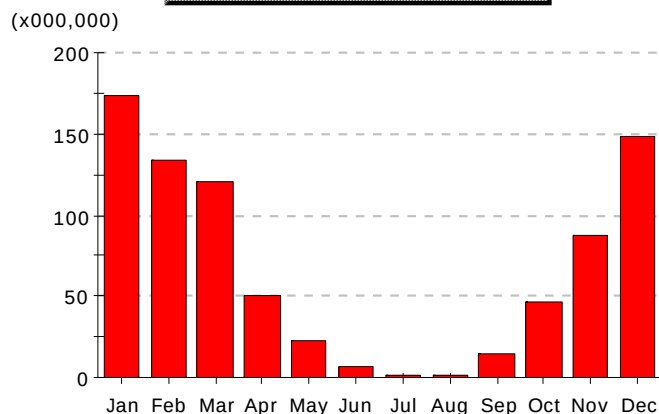
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	206.5	161.9	148.4	67.2	33.1	10.8	1.5	3.1	21.4	62.1	111.3	179.2	1,006.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	206.5	161.9	148.4	67.2	33.1	10.8	1.5	3.1	21.4	62.1	111.3	179.2	1,006.3

Electric Consumption (kWh)**Gas Consumption (Btu)****Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.54	0.49	0.54	0.54	0.99	2.35	4.44	3.60	1.41	0.64	0.53	0.54	16.62
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	2.83	2.24	2.07	0.99	0.49	0.17	0.02	0.05	0.35	0.99	1.65	2.50	14.33
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.26	0.25	0.29	0.28	0.25	0.23	0.22	0.21	0.20	0.21	0.22	0.24	2.85
Vent. Fans	3.61	3.26	3.61	3.50	3.61	3.50	3.61	3.61	3.50	3.61	3.50	3.61	42.53
Pumps & Aux.	1.53	1.39	1.53	1.49	1.53	1.49	1.53	1.53	1.49	1.53	1.49	1.53	18.07
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.64	0.61	0.70	0.68	0.67	0.68	0.69	0.68	0.66	0.67	0.63	0.66	7.96
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	2.39	2.26	2.63	2.53	2.48	2.53	2.56	2.54	2.44	2.48	2.35	2.45	29.62
Total	11.81	10.49	11.38	9.99	10.02	10.94	13.08	12.22	10.03	10.14	10.35	11.54	131.99

Gas Consumption (Btu x000,000)

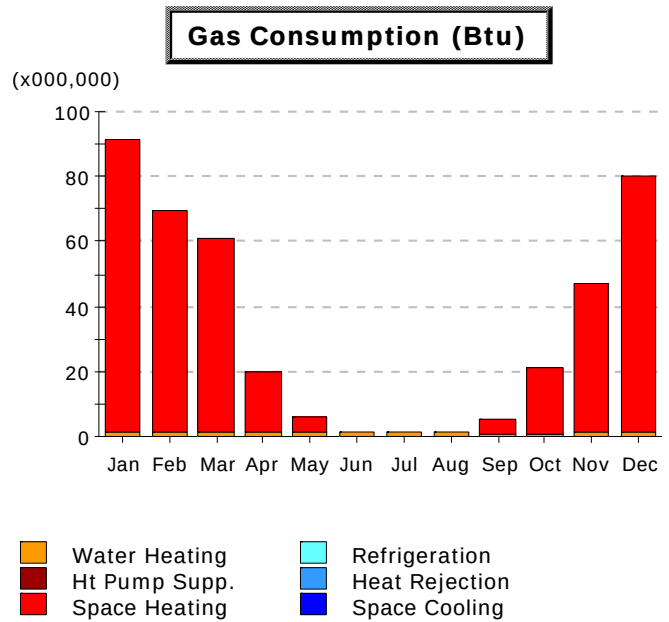
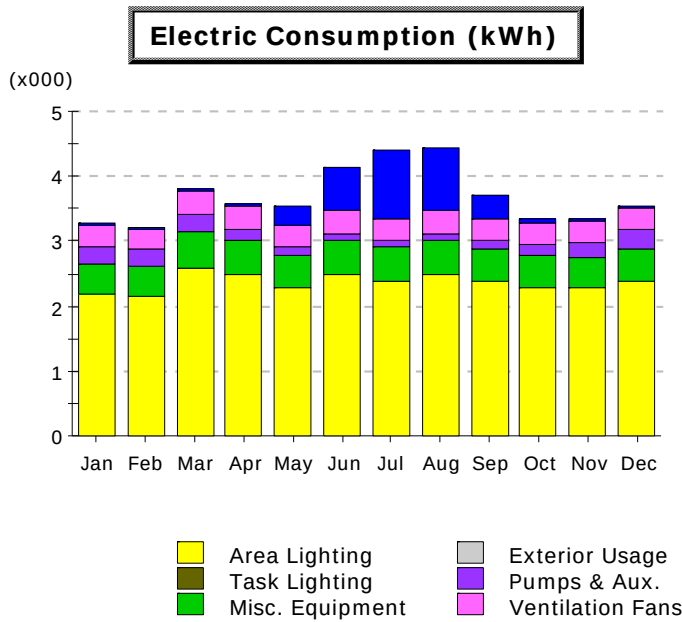
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	206.5	161.9	148.4	67.2	33.1	10.8	1.5	3.1	21.4	62.1	111.3	179.2	1,006.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	206.5	161.9	148.4	67.2	33.1	10.8	1.5	3.1	21.4	62.1	111.3	179.2	1,006.3

Electric Consumption (kWh)**Gas Consumption (Btu)****Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.83	0.75	0.83	0.82	1.37	2.97	5.46	4.48	1.85	0.95	0.80	0.83	21.92
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	2.98	2.37	2.21	1.09	0.55	0.19	0.02	0.05	0.39	1.08	1.77	2.65	15.35
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.26	0.25	0.29	0.28	0.25	0.23	0.22	0.21	0.20	0.21	0.22	0.24	2.85
Vent. Fans	3.61	3.26	3.61	3.50	3.61	3.50	3.61	3.61	3.50	3.61	3.50	3.61	42.53
Pumps & Aux.	1.57	1.41	1.57	1.52	1.57	1.52	1.57	1.57	1.52	1.57	1.52	1.57	18.44
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.64	0.61	0.70	0.68	0.67	0.68	0.69	0.68	0.66	0.67	0.63	0.66	7.96
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	2.39	2.26	2.63	2.53	2.48	2.53	2.56	2.54	2.44	2.48	2.35	2.45	29.62
Total	12.28	10.91	11.83	10.40	10.49	11.61	14.13	13.14	10.54	10.56	10.78	12.00	138.67

Gas Consumption (Btu x000,000)

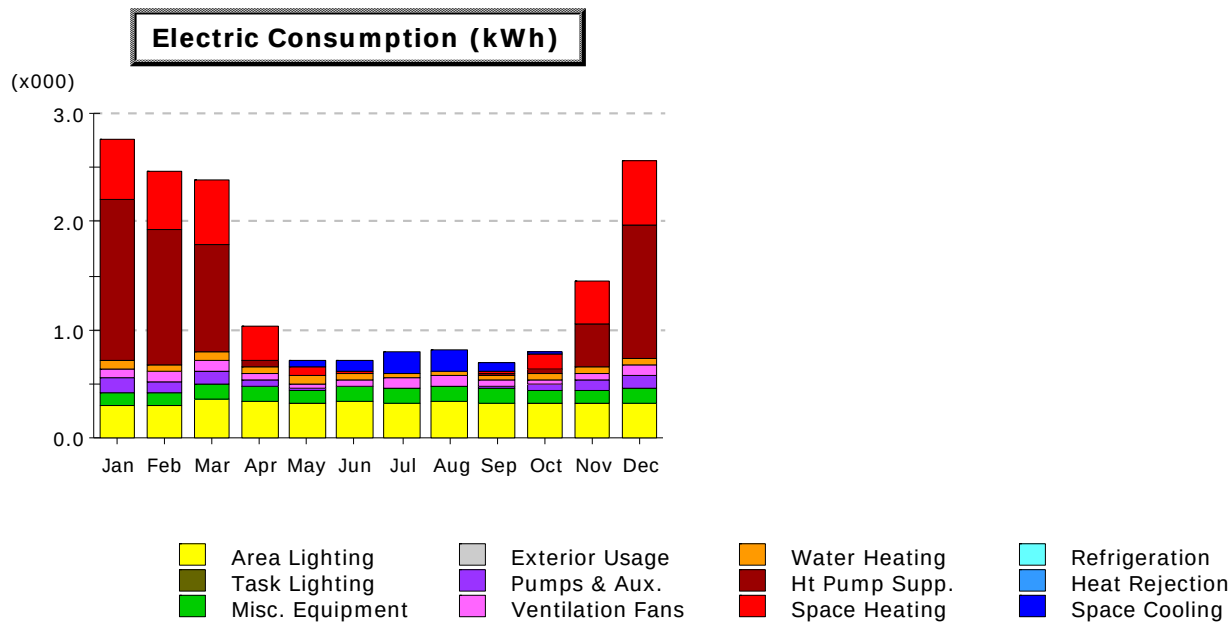
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	173.81	133.98	120.46	50.11	22.81	6.66	0.72	1.60	14.43	45.89	88.06	148.48	807.01
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	173.81	133.98	120.46	50.11	22.81	6.66	0.72	1.60	14.43	45.89	88.06	148.48	807.01

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.02	0.02	0.02	0.03	0.30	0.68	1.04	0.94	0.36	0.07	0.02	0.02	3.54
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.32	0.32	0.38	0.36	0.34	0.36	0.35	0.36	0.35	0.34	0.33	0.35	4.15
Pumps & Aux.	0.27	0.25	0.26	0.17	0.13	0.10	0.10	0.10	0.11	0.17	0.22	0.27	2.15
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.48	0.47	0.55	0.53	0.50	0.53	0.52	0.54	0.51	0.50	0.49	0.52	6.15
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	2.17	2.16	2.59	2.48	2.28	2.48	2.39	2.49	2.38	2.28	2.27	2.38	28.34
Total	3.27	3.21	3.81	3.58	3.55	4.15	4.40	4.42	3.71	3.36	3.34	3.53	44.33

Gas Consumption (Btu x000,000)

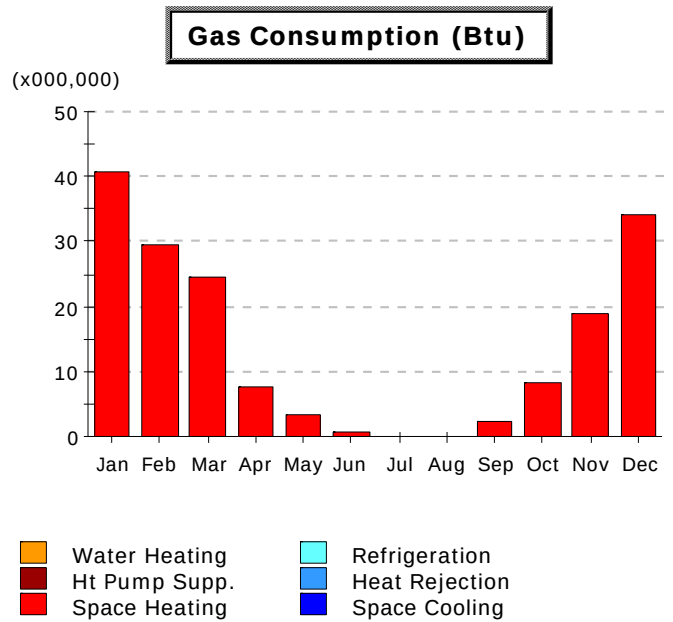
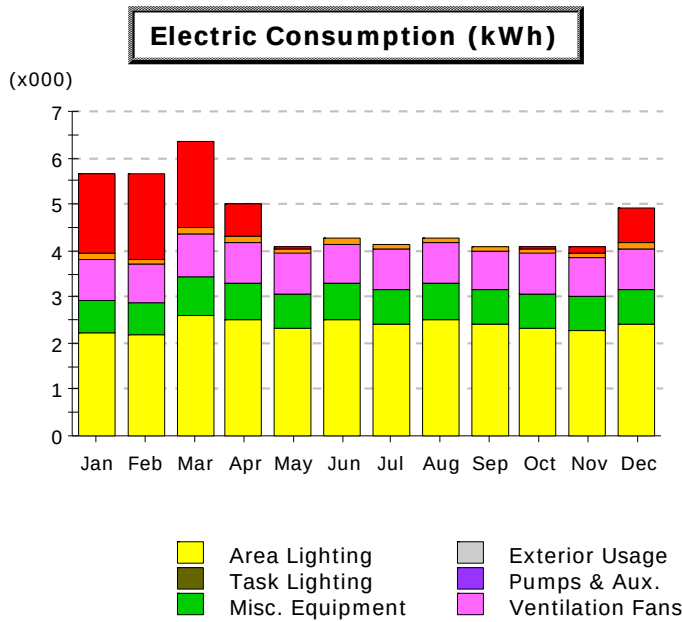
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	89.91	68.33	59.61	18.42	4.81	0.39	-	-	4.02	20.47	46.24	78.69	390.87
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	1.19	1.22	1.45	1.36	1.17	1.15	1.03	1.02	0.98	0.99	1.06	1.21	13.82
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	91.11	69.55	61.06	19.78	5.97	1.54	1.03	1.02	4.99	21.46	47.30	79.90	404.70

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.00	0.05	0.11	0.19	0.18	0.09	0.01	0.00	-	0.63
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.55	0.55	0.60	0.30	0.09	0.01	-	0.00	0.02	0.15	0.40	0.58	3.24
HP Supp.	1.50	1.24	1.00	0.06	0.01	-	-	-	0.00	0.04	0.39	1.23	5.47
Hot Water	0.07	0.07	0.08	0.07	0.06	0.06	0.05	0.05	0.05	0.05	0.06	0.07	0.74
Vent. Fans	0.09	0.09	0.10	0.05	0.04	0.07	0.10	0.10	0.06	0.04	0.07	0.10	0.91
Pumps & Aux.	0.14	0.12	0.12	0.06	0.03	0.00	-	0.00	0.02	0.07	0.10	0.13	0.79
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.11	0.11	0.13	0.13	0.12	0.13	0.12	0.13	0.12	0.12	0.12	0.12	1.48
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.30	0.30	0.36	0.34	0.31	0.34	0.33	0.34	0.33	0.31	0.31	0.33	3.89
Total	2.75	2.47	2.39	1.03	0.71	0.72	0.79	0.81	0.70	0.80	1.45	2.55	17.16

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

**Electric Consumption (kWh x000)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.72	1.84	1.86	0.73	0.04	0.00	-	-	0.02	0.08	0.13	0.74	7.16
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.12	0.12	0.14	0.14	0.12	0.12	0.10	0.10	0.10	0.10	0.11	0.12	1.39
Vent. Fans	0.90	0.83	0.93	0.88	0.87	0.85	0.87	0.88	0.84	0.87	0.84	0.88	10.44
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.71	0.69	0.81	0.78	0.74	0.78	0.76	0.79	0.75	0.74	0.72	0.75	9.01
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	2.21	2.18	2.61	2.50	2.31	2.50	2.41	2.51	2.40	2.31	2.29	2.40	28.62
Total	5.66	5.66	6.35	5.02	4.08	4.25	4.14	4.28	4.10	4.10	4.09	4.89	56.62

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	40.88	29.52	24.53	7.53	3.16	0.66	0.00	0.05	2.21	8.26	18.78	34.01	169.60
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	40.88	29.52	24.53	7.53	3.16	0.66	0.00	0.05	2.21	8.26	18.78	34.01	169.60

APPENDIX G

Lighting Upgrades Analysis Spreadsheet

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	
City Hall - Exterior	001	Parking Lot Exterior	Pole Mounted Luminaire - 1 Head (Assume 400W MH)	3	1374	1.374		4380	\$1,059.8	Replace 400W Fixture with Induction Light Fixture	3	645	0.645	4380	4380	2825.1	2825.1	None Proposed	0	0.729	3193.02	562.3	\$0.0	\$485.0	\$137.0	\$0.0	\$0.0	\$137.0	\$485.0	\$622.0	\$411.0	\$1,455.0	\$1,866.0	
City Hall - Interior	000	Assistant Director	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3120	698.88	\$123.1	None Proposed	2	224	0.224	3120	3120	698.88	698.88	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Boiler Room	13W CFL Fixture	9	117	0.117	500	58.5	\$10.3	None Proposed	9	117	0.117	500	500	58.5	58.5	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Closet	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$8.9	None Proposed	2	101.4	0.1014	500	350	50.7	35.49	Ceiling Mounted Occupancy Sensor	1	0	15.21	2.7	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
City Hall - Interior	000	Control Room	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3120	158.184	\$27.9	None Proposed	1	50.7	0.0507	3120	3120	158.184	158.184	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Counsils Chambers	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	9	228.6	0.2286	4380	1001.268	\$176.3	None Proposed	9	228.6	0.2286	4380	4380	1001.268	1001.268	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Director's Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3120	698.88	\$123.1	None Proposed	2	224	0.224	3120	3120	698.88	698.88	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	DPW	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	10	1120	1.12	3120	3494.4	\$615.4	None Proposed	10	1120	1.12	3120	3120	3494.4	3494.4	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	DPW	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	7	177.8	0.1778	3120	554.736	\$97.7	None Proposed	7	177.8	0.1778	3120	3120	554.736	554.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	DPW	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	6	152.4	0.1524	3120	475.488	\$83.7	None Proposed	6	152.4	0.1524	3120	3120	475.488	475.488	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	DPW	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3120	698.88	\$123.1	None Proposed	2	224	0.224	3120	3120	698.88	698.88	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	DPW	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$55.7	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	DPW	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$111.4	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	DPW	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3120	949.104	\$167.1	None Proposed	6	304.2	0.3042	3120	3120	949.104	949.104	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	DPW	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	8	896	0.896	3120	2795.52	\$492.3	None Proposed	8	896	0.896	3120	3120	2795.52	2795.52	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	DPW	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	31	3472	3.472	3120	10832.64	\$1,907.6	None Proposed	31	3472	3.472	3120	3120	10832.64	10832.64	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$137.0	\$0.0	\$622.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	000	DPW	42W CFL Fixture	2	98	0.098	3120	305.76	\$53.8	None Proposed	2	98	0.098	3120	3120	305.76	305.76	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	DPW Conference	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	336	0.336	3120	1048.32	\$184.6	None Proposed	3	336	0.336	3120	3120	1048.32	1048.32	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	DPW Offices	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	8	896	0.896	3120	2795.52	\$492.3	None Proposed	8	896	0.896	3120	3120	2795.52	2795.52	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	DPW Offices	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$55.7	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Electrical Room	60W Incandescent Fixture	1	60	0.06	500	30	\$5.3	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0.047	25.45	4.5	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$93.5	\$108.0	\$201.5	
City Hall - Interior	000	Elevator	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$156.4	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Elevator Room	13W CFL Fixture	2	26	0.026	500	13	\$2.3	None Proposed	2	26	0.026	500	350	13	9.1	Ceiling Mounted Occupancy Sensor	1	0	3.9	0.7	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
City Hall - Interior	000	Engineering	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	2	50.8	0.0508	3120	158.496	\$27.9	None Proposed	2	50.8	0.0508	3120	3120	158.496	158.496	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Hallway	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	9	228.6	0.2286	3120	713.232	\$125.6	None Proposed	9	228.6	0.2286	3120	3120	713.232	713.232	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$55.7	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Hallway	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	3	76.2	0.0762	3120	237.744	\$41.9	None Proposed	3	76.2	0.0762	3120	3120	237.744	237.744	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Hallway	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	3120	1397.76	\$246.1	None Proposed	4	448	0.448	3120	3120	1397.76	1397.76	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	3120	1265.472	\$222.8	None Proposed	8	405.6	0.4056	3120	3120	1265.472	1265.472	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3120	158.184	\$27.9	None Proposed	1	50.7	0.0507	3120	3120	158.184	158.184	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Hallway	42W CFL Fixture	4	196	0.196	3120	611.52	\$107.7	None Proposed	4	196	0.196	3120	3120	611.52	611.52	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Lounge	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3120	949.104	\$167.1	None Proposed	6	304.2	0.3042	3120	3120	949.104	949.104	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Maintenance	8' T12 Fixture w/ 1-T12 Lamp	2	224	0.224	3120	698.88	\$123.1	Replace 8' T12 Fixture with 1 Tandem Double-Length 1-T8 Lamp Fixture	2	128	0.128	3120	3120	399.36	399.36	None Proposed	0	0.096	299.52	52.7	\$65.1	\$82.0	\$93.0	\$0.0	\$0.0	\$93.0	\$147.1	\$240.1	\$186.0	\$294.2	\$480.2	
City Hall - Interior	000	Maintenance	1x4 Fixtures w/ 1-T12 Lamp Fixture w/ Magnetic Ballast	1	42.8	0.0428	3120	133.536	\$23.5	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	24.32	0.02432	3120	3120	75.8784	75.8784	None Proposed	0	0.01848	57.6576	10.2	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0	
City Hall - Interior	000	Maintenance	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$55.7	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Maintenance	60W Incandescent Fixture	2	120	0.12	3120	374.4	\$65.9	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	3120	3120	81.12	81.12	None Proposed	0	0.094	293.28	51.6	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$40.0	\$10.0	\$50.0	
City Hall - Interior	000	Maintenance	13W CFL Fixture	1	13	0.013	3120	40.56	\$7.1	None Proposed	1	13	0.013	3120	3120	40.56	40.56	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Maintenance Vault	8' T12 Fixture w/ 1-T12 Lamp	8	896	0.896	500	448	\$78.9	Replace 8' T12 Fixture with 1 Tandem Double-Length 1-T8 Lamp Fixture	8	512	0.512	500	500	256	256	None Proposed	0	0.384	192	33.8	\$65.1	\$82.0	\$93.0	\$0.0	\$0.0	\$93.0	\$147.1	\$240.1	\$744.0	\$1,176.8	\$1,920.8	
City Hall - Interior	000	Mens Bathroom	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	500	112	\$19.7	None Proposed	2	224	0.224	500	500	112	112	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	000	Mens Bathroom	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	2	50.8	0.0508	500	25.4	\$4.5	None Proposed	2	50.8	0.0508	500</																				

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
City Hall - Interior	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	709.8	0.7098	3120	2214.576	\$390.0	None Proposed	14	709.8	0.7098	3120	3120	2214.576	2214.576	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Hallway	2' 17W Fluorescent Fixture	3	45	0.045	3120	140.4	\$24.7	None Proposed	3	45	0.045	3120	3120	140.4	140.4	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Hallway	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	24	609.6	0.6096	3120	1901.952	\$334.9	None Proposed	24	609.6	0.6096	3120	3120	1901.952	1901.952	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Hallway	2' 17W Fluorescent Fixture	1	15	0.015	3120	46.8	\$8.2	None Proposed	1	15	0.015	3120	3120	46.8	46.8	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$55.7	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Meeting Room	13W CFL Fixture	4	52	0.052	3120	162.24	\$28.6	None Proposed	4	52	0.052	3120	3120	162.24	162.24	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Mens Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$8.9	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Mens Bathroom	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	500	12.7	\$2.2	None Proposed	1	25.4	0.0254	500	500	12.7	12.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Registrars Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	14	1568	1.568	3120	4892.16	\$861.5	None Proposed	14	1568	1.568	3120	3120	4892.16	4892.16	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Registrars Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3120	698.88	\$123.1	None Proposed	2	224	0.224	3120	3120	698.88	698.88	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Renaissance Department	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	3120	1397.76	\$246.1	None Proposed	4	448	0.448	3120	3120	1397.76	1397.76	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Renaissance Department	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	3120	1397.76	\$246.1	None Proposed	4	448	0.448	3120	3120	1397.76	1397.76	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Renaissance Department	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3120	698.88	\$123.1	None Proposed	2	224	0.224	3120	3120	698.88	698.88	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Stairwell	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	2	50.8	0.0508	3120	158.496	\$27.9	None Proposed	2	50.8	0.0508	3120	3120	158.496	158.496	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Tax Assessor	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3120	949.104	\$167.1	None Proposed	6	304.2	0.3042	3120	3120	949.104	949.104	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Tax Assessor	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	15	1680	1.68	3120	5241.6	\$923.0	None Proposed	15	1680	1.68	3120	3120	5241.6	5241.6	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Tax Assessor	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$111.4	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Tax Assessor	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$111.4	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Tax Collector	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3120	698.88	\$123.1	None Proposed	2	224	0.224	3120	3120	698.88	698.88	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Tax Collector	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$111.4	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Tax Collector	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$55.7	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Tax Collector	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	16	1792	1.792	3120	5591.04	\$984.6	None Proposed	16	1792	1.792	3120	3120	5591.04	5591.04	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Tax Collector	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3120	158.184	\$27.9	None Proposed	1	50.7	0.0507	3120	3120	158.184	158.184	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Tax Collector	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$111.4	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Town Clerk	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	11	1232	1.232	3120	3843.84	\$676.9	None Proposed	11	1232	1.232	3120	3120	3843.84	3843.84	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Womens Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$8.9	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	001	Womens Bathroom	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	500	12.7	\$2.2	None Proposed	1	25.4	0.0254	500	500	12.7	12.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Break Room	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$55.7	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Buildings	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	1344	1.344	3120	4193.28	\$738.4	None Proposed	12	1344	1.344	3120	3120	4193.28	4193.28	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Buildings	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	3120	790.92	\$139.3	None Proposed	5	253.5	0.2535	3120	3120	790.92	790.92	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Buildings	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	3120	2096.64	\$369.2	None Proposed	6	672	0.672	3120	3120	2096.64	2096.64	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Closet	42W CFL Fixture	3	147	0.147	500	73.5	\$12.9	None Proposed	3	147	0.147	500	350	73.5	51.45	Ceiling Mounted Occupancy Sensor	1	0	22.05	3.9	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$0.0	\$176.5	
City Hall - Interior	002	Conference Room	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	3120	1397.76	\$246.1	None Proposed	4	448	0.448	3120	3120	1397.76	1397.76	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Copy Room	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.5	None Proposed	1	50.7	0.0507	900	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Development	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	3120	790.92	\$139.3	None Proposed	5	253.5	0.2535	3120	3120	790.92	790.92	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Development	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	3120	2096.64	\$369.2	None Proposed	6	672	0.672	3120	3120	2096.64	2096.64	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Development	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	336	0.336	3120	1048.32	\$184.6	None Proposed	3	336	0.336	3120	3120	1048.32	1048.32	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Development	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3120	949.104	\$167.1	None Proposed	6	304.2	0.3042	3120	3120	949.104	949.104	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Development	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	336	0.336	3120	1048.32	\$184.6	None Proposed	3	336	0.336	3120	3120	1048.32	1048.32	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Development	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	336	0.336	3120	1048.32	\$184.6	None Proposed	3	336	0.336	3120	3120	1048.32	1048.32	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Development	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	336	0.336	3120	1048.32	\$184.6	None Proposed	3	336	0.336	3120	3120	1048.32	1048.32	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
City Hall - Interior	002	Development	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	3120	2096.64	\$369.2																								

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
City Hall - Interior	002	Parks	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3120	158.184	\$27.9	None Proposed	1	50.7	0.0507	3120	3120	158.184	158.184	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Parks	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$111.4	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Parks	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$55.7	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Personel	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	336	0.336	3120	1048.32	\$184.6	None Proposed	3	336	0.336	3120	3120	1048.32	1048.32	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Personel	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	7	784	0.784	3120	2446.08	\$430.8	None Proposed	7	784	0.784	3120	3120	2446.08	2446.08	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Personel	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$111.4	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Personel	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	336	0.336	3120	1048.32	\$184.6	None Proposed	3	336	0.336	3120	3120	1048.32	1048.32	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Purchasing	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	1008	1.008	3120	3144.96	\$553.8	None Proposed	9	1008	1.008	3120	3120	3144.96	3144.96	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Purchasing	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3120	949.104	\$167.1	None Proposed	6	304.2	0.3042	3120	3120	949.104	949.104	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Purchasing	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	3120	2096.64	\$369.2	None Proposed	6	672	0.672	3120	3120	2096.64	2096.64	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Staff Lounge	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	8	896	0.896	3120	2795.52	\$492.3	None Proposed	8	896	0.896	3120	3120	2795.52	2795.52	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$8.9	None Proposed	2	101.4	0.1014	500	350	50.7	35.49	Ceiling Mounted Occupancy Sensor	1	0	15.21	2.7	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
City Hall - Interior	002	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$8.9	None Proposed	2	101.4	0.1014	500	350	50.7	35.49	Ceiling Mounted Occupancy Sensor	1	0	15.21	2.7	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
City Hall - Interior	002	Vault	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$17.9	None Proposed	4	202.8	0.2028	500	500	101.4	101.4	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Veterans Service	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	16	1792	1.792	3120	5591.04	\$984.6	None Proposed	16	1792	1.792	3120	3120	5591.04	5591.04	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Womens Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$8.9	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	002	Womens Bathroom	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	500	12.7	\$2.2	None Proposed	1	25.4	0.0254	500	500	12.7	12.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Comptroler	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$111.4	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Comptroler	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	45	5040	5.04	3120	15724.8	\$2,769.1	None Proposed	45	5040	5.04	3120	3120	15724.8	15724.8	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Comptroler Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	3120	2096.64	\$369.2	None Proposed	6	672	0.672	3120	3120	2096.64	2096.64	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Conference Room	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3120	949.104	\$167.1	None Proposed	6	304.2	0.3042	3120	3120	949.104	949.104	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Copy Center	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	3120	2096.64	\$369.2	None Proposed	6	672	0.672	3120	3120	2096.64	2096.64	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Corp. Counsel	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3120	698.88	\$123.1	None Proposed	2	224	0.224	3120	3120	698.88	698.88	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Corp. Counsel	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3120	158.184	\$27.9	None Proposed	1	50.7	0.0507	3120	3120	158.184	158.184	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Corp. Counsel	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3120	949.104	\$167.1	None Proposed	6	304.2	0.3042	3120	3120	949.104	949.104	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Corp. Counsel	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	3120	1581.84	\$278.6	None Proposed	10	507	0.507	3120	3120	1581.84	1581.84	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Corp. Counsel	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	3120	2096.64	\$369.2	None Proposed	6	672	0.672	3120	3120	2096.64	2096.64	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Corp. Counsel	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$55.7	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Court	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	456.3	0.4563	3120	1423.656	\$250.7	None Proposed	9	456.3	0.4563	3120	3120	1423.656	1423.656	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Court	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3120	698.88	\$123.1	None Proposed	2	224	0.224	3120	3120	698.88	698.88	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Court	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$55.7	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Custodial Closet	60W Incandescent Fixture	1	60	0.06	500	30	\$5.3	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0.047	25.45	4.5	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$93.5	\$108.0	\$201.5
City Hall - Interior	003	Electrical Room	13W CFL Fixture	1	13	0.013	500	6.5	\$1.1	None Proposed	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0	1.95	0.3	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
City Hall - Interior	003	Hallway	13W CFL Fixture	18	234	0.234	3120	730.08	\$128.6	None Proposed	18	234	0.234	3120	3120	730.08	730.08	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Hallway	1X4 Suspended Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	50	1270	1.27	3120	3962.4	\$697.8	None Proposed	50	1270	1.27	3120	3120	3962.4	3962.4	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Mayor	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$111.4	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Mayor	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$55.7	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Mayor	60W Incandescent Fixture	1	60	0.06	3120	187.2	\$33.0	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	3120	3120	40.56	40.56	None Proposed	0	0.047	146.64	25.8	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
City Hall - Interior	003	Mayor	60W Incandescent Fixture	3	180	0.18	3120	561.6	\$98.9	Replace 60W Incandescent Fixture with 13W CFL	3	39	0.039	3120	3120	121.68	121.68	None Proposed	0	0.141	438.92	77.5	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$60.0	\$15.0	\$75.0
City Hall - Interior	003	Mayor	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	3120	1397.76	\$246.1	None Proposed	4	448	0.448	3120	3120	1397.76	1397.76	None Proposed	0	0	0	0.0	\$0.0	\$									

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	
City Hall - Interior	003	Probate Court	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	8	896	0.896	3120	2795.52	\$482.3	None Proposed	8	896	0.896	3120	3120	2795.52	2795.52	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Probate Court	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$55.7	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Probate Court	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3120	949.104	\$167.1	None Proposed	6	304.2	0.3042	3120	3120	949.104	949.104	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Treasurer	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$111.4	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Treasurer	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	3120	1397.76	\$246.1	None Proposed	4	448	0.448	3120	3120	1397.76	1397.76	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Treasurer	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$55.7	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Treasurer	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3120	949.104	\$167.1	None Proposed	6	304.2	0.3042	3120	3120	949.104	949.104	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Womens Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	\$13.4	None Proposed	3	152.1	0.1521	500	500	76.05	76.05	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Womens Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.5	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	003	Womens Bathroom	42W CFL Fixture	1	49	0.049	500	24.5	\$4.3	None Proposed	1	49	0.049	500	500	24.5	24.5	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	004	Penithouse	150W Incandescent Fixture	6	900	0.9	500	450	\$79.2	Replace 150W Incandescent Fixture with 25W CFL	6	150	0.15	500	500	75	75	None Proposed	0	0.75	375	66.0	\$0.0	\$7.0	\$20.0	\$0.0	\$0.0	\$20.0	\$7.0	\$27.0	\$120.0	\$42.0	\$162.0	
City Hall - Interior	004	Penithouse	42W CFL Fixture	4	196	0.196	500	98	\$17.3	None Proposed	4	196	0.196	500	500	98	98	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall - Interior	004	Penithouse	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$8.9	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall Annex - Exterior	001	Exterior	60W Incandescent Fixture	4	240	0.24	4380	1051.2	\$199.1	Replace 60W Incandescent Fixture with 13W CFL	4	52	0.052	4380	4380	227.76	227.76	None Proposed	0	0.188	823.44	156.0	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$80.0	\$20.0	\$100.0	
City Hall Annex - Exterior	001	Exterior	60W Incandescent Fixture	2	120	0.12	4380	525.6	\$99.5	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	4380	4380	113.88	113.88	None Proposed	0	0.094	411.72	78.0	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$40.0	\$10.0	\$50.0	
City Hall Annex - Exterior	001	Exterior	150W Incandescent Fixture	2	300	0.3	4380	1314	\$248.9	Replace 150W Incandescent Fixture with 25W CFL	2	50	0.05	4380	4380	219	219	None Proposed	0	0.25	1095	207.4	\$0.0	\$7.0	\$20.0	\$0.0	\$0.0	\$20.0	\$7.0	\$27.0	\$40.0	\$14.0	\$54.0	
City Hall Annex - Interior	001	Annex	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	3	256.8	0.2568	500	128.4	\$24.3	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	3	145.8	0.1458	500	500	72.9	72.9	None Proposed	0	0.111	55.5	10.5	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$195.0	\$240.0	\$425.0	
City Hall Annex - Interior	001	Annex	60W Incandescent Fixture	1	60	0.06	4380	262.8	\$49.8	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	4380	4380	56.94	56.94	None Proposed	0	0.047	205.86	39.0	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0	
City Hall Annex - Interior	001	Annex	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	4380	1332.396	\$252.4	None Proposed	6	304.2	0.3042	4380	4380	1332.396	1332.396	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
City Hall Annex - Interior	001	Electrical Room	42W CFL Fixture	1	49	0.049	500	24.5	\$4.6	None Proposed	1	49	0.049	500	350	24.5	17.15	Ceiling Mounted Occupancy Sensor	1	0	7.35	1.4	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Water Department - #1 Well House - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	1	90	0.09	4380	394.2	\$94.6	Replace 70W Fixture with Induction Light Fixture	1	44	0.044	4380	4380	192.72	192.72	None Proposed	0	0.046	201.48	48.4	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$137.0	\$380.0	\$517.0	
Water Department - #1 Well House - Interior	001	Interior	8' T12 Fixture w/ 2-T12 Lamps	2	454	0.454	500	227	\$54.5	Replace 8' T12 Fixture with 1 Tandem Double-Length 2-T8 Lamp Fixture	2	240	0.24	500	500	120	120	None Proposed	0	0.214	107	25.7	\$65.1	\$105.0	\$93.0	\$0.0	\$0.0	\$93.0	\$170.1	\$263.1	\$186.0	\$340.2	\$526.2	
Water Department - #1 Well House - Interior	001	Interior	60W Incandescent Fixture	11	660	0.66	500	330	\$79.2	Replace 60W Incandescent Fixture with 13W CFL	11	143	0.143	500	500	71.5	71.5	None Proposed	0	0.517	258.5	62.0	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$220.0	\$55.0	\$275.0	
Water Department - #2 Well House - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	1	90	0.09	4380	394.2	\$73.2	Replace 70W Fixture with Induction Light Fixture	1	44	0.044	4380	4380	192.72	192.72	None Proposed	0	0.046	201.48	37.4	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$137.0	\$380.0	\$517.0	
Water Department - #2 Well House - Interior	001	Interior	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$9.4	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - #3 Well House - Interior	001	Interior	60W Incandescent Fixture	2	120	0.12	500	60	\$9.5	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	500	500	13	13	None Proposed	0	0.094	47	7.4	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$40.0	\$10.0	\$50.0	
Water Department - #4 Well House - Interior	001	Interior	60W Incandescent Fixture	2	120	0.12	500	60	\$9.5	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	500	500	13	13	None Proposed	0	0.094	47	7.4	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$40.0	\$10.0	\$50.0	
Water Department - Garage - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	8	720	0.72	4380	3153.6	\$351.9	Replace 70W Fixture with Induction Light Fixture	8	352	0.352	4380	4380	1541.76	1541.76	None Proposed	0	0.368	1611.84	179.9	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$1,096.0	\$3,040.0	\$4,136.0	
Water Department - Garage - Interior	001	Garage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	500	253.5	\$28.3	None Proposed	10	507	0.507	500	500	253.5	253.5	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Garage - Interior	001	Garage	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	3	256.8	0.2568	500	128.4	\$14.3	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	3	145.8	0.1458	500	500	72.9	72.9	None Proposed	0	0.111	55.5	6.2	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$195.0	\$240.0	\$425.0	
Water Department - High Service Pump Station - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	2	180	0.18	4380	788.4	\$123.4	Replace 70W Fixture with Induction Light Fixture	2	88	0.088	4380	4380	385.44	385.44	None Proposed	0	0.092	402.96	63.1	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$274.0	\$760.0	\$1,034.0	
Water Department - High Service Pump Station - Interior	001	Interior	60W Incandescent Fixture	4	240	0.24	3120	748.8	\$117.2	Replace 60W Incandescent Fixture with 13W CFL	4	52	0.052	3120	3120	162.24	162.24	None Proposed	0	0.188	586.56	91.8	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$80.0	\$20.0	\$100.0	
Water Department - Main Office - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	8	720	0.72	4380	3153.6	\$351.9	Replace 70W Fixture with Induction Light Fixture	8	352	0.352	4380	4380	1541.76	1541.76	None Proposed	0	0.368	1611.84	179.9	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$1,096.0	\$3,040.0	\$4,136.0	
Water Department - Main Office - Interior	001	Basement	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	15	381	0.381	3120	1188.72	\$132.7	None Proposed	15	381	0.381	3120	3120	1188.72	1188.72	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Main Office - Interior	001	Basement	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$35.3	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Main Office - Interior	001	Bathroom	60W Incandescent Fixture	3	180	0.18	500	90	\$10.0	Replace 60W Incandescent Fixture with 13W CFL	3	39	0.039	500	500	19.5	19.5	None Proposed	0	0.141	70.5	7.9	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$60.0	\$15.0	\$75.0	
Water Department - Main Office - Interior	001	Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$2.8	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Main Office - Interior	001	Closet	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	500	112	\$12.5	None Proposed	2	224	0.224	500	350	112	78.4	Ceiling Mounted Occupancy Sensor	1	0	33.6	3.7	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Water Department - Main Office - Interior	001	Conference Room	60W Incandescent Fixture	3	180	0.18	3120	561.6	\$62.7	Replace 60W Incandescent Fixture with 13W CFL	3	39	0.039	3120	3120																			

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Water Department - Water Filtration Plant - Interior	001	Basement Pumps	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	3120	1898.208	\$292.1	None Proposed	12	608.4	0.6084	3120	3120	1898.208	1898.208	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Basement Pumps	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3120	949.104	\$148.5	None Proposed	6	304.2	0.3042	3120	3120	949.104	949.104	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$7.9	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Chemical Area	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	32	1622.4	1.6224	3120	5061.888	\$792.2	None Proposed	32	1622.4	1.6224	3120	3120	5061.888	5061.888	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Chlorine Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	3120	1581.84	\$247.6	None Proposed	10	507	0.507	3120	3120	1581.84	1581.84	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Control Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$99.0	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Electrical Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	\$11.9	None Proposed	3	152.1	0.1521	500	350	76.05	53.235	Ceiling Mounted Occupancy Sensor	1	0	22.815	3.6	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Water Department - Water Filtration Plant - Interior	001	Electrical Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	500	126.75	\$19.8	None Proposed	5	253.5	0.2535	500	350	126.75	88.725	Ceiling Mounted Occupancy Sensor	1	0	38.025	6.0	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Water Department - Water Filtration Plant - Interior	001	Filter Gallery	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	25	1267.5	1.2675	3120	3954.6	\$618.9	None Proposed	25	1267.5	1.2675	3120	3120	3954.6	3954.6	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Filter Gallery	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	38	1926.6	1.9266	3120	6010.992	\$940.7	None Proposed	38	1926.6	1.9266	3120	3120	6010.992	6010.992	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Garage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	3120	1581.84	\$247.6	None Proposed	10	507	0.507	3120	3120	1581.84	1581.84	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Generator Area	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$99.0	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	3120	790.92	\$123.8	None Proposed	5	253.5	0.2535	3120	3120	790.92	790.92	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3120	474.552	\$74.3	None Proposed	3	152.1	0.1521	3120	3120	474.552	474.552	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Kitchen	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	557.7	0.5577	3120	1740.024	\$272.3	None Proposed	11	557.7	0.5577	3120	3120	1740.024	1740.024	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Lab	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	354.9	0.3549	3120	1107.288	\$173.3	None Proposed	7	354.9	0.3549	3120	3120	1107.288	1107.288	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Mechanical Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	3120	790.92	\$123.8	None Proposed	5	253.5	0.2535	3120	3120	790.92	790.92	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Mens Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	456.3	0.4563	500	228.15	\$35.7	None Proposed	9	456.3	0.4563	500	500	228.15	228.15	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Mens Bathroom	60W Incandescent Fixture	2	120	0.12	500	60	\$9.4	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	500	500	13	13	None Proposed	0	0.094	47	7.4	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$40.0	\$10.0	\$50.0
Water Department - Water Filtration Plant - Interior	001	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	1014	1.014	3120	3163.68	\$495.1	None Proposed	20	1014	1.014	3120	3120	3163.68	3163.68	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$99.0	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$99.0	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3120	474.552	\$74.3	None Proposed	3	152.1	0.1521	3120	3120	474.552	474.552	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$99.0	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Potassium Feed	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	3120	790.92	\$123.8	None Proposed	5	253.5	0.2535	3120	3120	790.92	790.92	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$99.0	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Stairwell	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3120	474.552	\$74.3	None Proposed	3	152.1	0.1521	3120	3120	474.552	474.552	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Stairwell	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3120	158.184	\$24.8	None Proposed	1	50.7	0.0507	3120	3120	158.184	158.184	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$7.9	None Proposed	2	101.4	0.1014	500	350	50.7	35.49	Ceiling Mounted Occupancy Sensor	1	0	15.21	2.4	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Water Department - Water Filtration Plant - Interior	001	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$15.9	None Proposed	4	202.8	0.2028	500	350	101.4	70.98	Ceiling Mounted Occupancy Sensor	1	0	30.42	4.8	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Water Department - Water Filtration Plant - Interior	001	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.0	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.2	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Water Department - Water Filtration Plant - Interior	001	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$7.9	None Proposed	2	101.4	0.1014	500	350	50.7	35.49	Ceiling Mounted Occupancy Sensor	1	0	15.21	2.4	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Water Department - Water Filtration Plant - Interior	001	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.0	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.2	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Water Department - Water Filtration Plant - Interior	001	Womens Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	354.9	0.3549	500	177.45	\$27.8	None Proposed	7	354.9	0.3549	500	500	177.45	177.45	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Department - Water Filtration Plant - Interior	001	Womens Bathroom	60W Incandescent Fixture	2	120	0.12	500	60	\$9.4	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	500	500	13	13	None Proposed	0	0.094	47	7.4	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$40.0	\$10.0	\$50.0
Water Department - Water Filtration Plant - Exterior	000	Exterior	Pole Mounted Luminaire - 1 Head (Assume 400W MH)	15	6870	6.87	4380	30090.6	\$4,709.2	Replace 400W Fixture with Induction Light Fixture	15	3225	3.225	4380	4380	14125.5	14125.5	None Proposed	1	3.645	15965.1	2,498.5	\$0.0	\$485.0	\$137.0	\$0.0	\$0.0	\$137.0	\$485.0	\$622.0	\$2,055.0	\$7,275.0	\$9,330.0

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Police Court - Interior	001	Admin Assistant	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Admin Assistant	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3500	1848	\$288.3	None Proposed	6	528	0.528	3500	3500	1848	1848	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Admin Assistant	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	88	0.088	3500	308	\$48.0	None Proposed	1	88	0.088	3500	3500	308	308	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Admin Assistant	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	3500	1774.5	\$276.8	None Proposed	10	507	0.507	3500	3500	1774.5	1774.5	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Parking Garage - Exterior	002	Exterior	Pole Mounted Luminaire - 1 Head (Assume 200W MH)	8	2376	2.376	4380	10406.88	\$1,623.5	Replace 200W Fixture with Induction Light Fixture	8	880	0.88	4380	4380	3854.4	3854.4	None Proposed	0	1.496	6552.48	1,022.2	\$0.0	\$760.0	\$137.0	\$0.0	\$0.0	\$137.0	\$760.0	\$897.0	\$1,096.0	\$6,080.0	\$7,176.0
Parking Garage - Exterior	002	Exterior	Pole Mounted Luminaire - 4 Head (Assume 200W MH)	1	1188	1.188	4380	5203.44	\$811.7	Replace 200W Fixture with Induction Light Fixture	1	440	0.44	4380	4380	1927.2	1927.2	None Proposed	0	0.748	3276.24	511.1	\$0.0	\$780.0	\$274.0	\$0.0	\$0.0	\$274.0	\$780.0	\$1,054.0	\$274.0	\$780.0	\$1,054.0
Parking Garage - Interior	002	Chiller	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	8760	1776.528	\$277.1	None Proposed	4	202.8	0.2028	8760	8760	1776.528	1776.528	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Parking Garage - Interior	002	Chiller	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	8760	1776.528	\$277.1	None Proposed	4	202.8	0.2028	8760	8760	1776.528	1776.528	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Parking Garage - Interior	002	Parking Garage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	32	1622.4	1.6224	8760	14212.224	\$2,217.1	None Proposed	32	1622.4	1.6224	8760	8760	14212.224	14212.224	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Parking Garage - Interior	002	Ramp Down	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	27	1368.9	1.3689	8760	11991.564	\$1,870.7	None Proposed	27	1368.9	1.3689	8760	8760	11991.564	11991.564	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Parking Garage - Interior	002	Ramp Up	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	27	1368.9	1.3689	8760	11991.564	\$1,870.7	None Proposed	27	1368.9	1.3689	8760	8760	11991.564	11991.564	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Parking Garage - Interior	002	Stairwell	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	456.3	0.4563	8760	3997.188	\$623.6	None Proposed	9	456.3	0.4563	8760	8760	3997.188	3997.188	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Exterior	002	Exterior	Flood Lights (Assume 400W MH)	5	2290	2.29	4380	10030.2	\$1,564.7	Replace 400W Fixture with Induction Light Fixture	5	1075	1.075	4380	4380	4708.5	4708.5	None Proposed	0	1.215	5321.7	830.2	\$0.0	\$485.0	\$137.0	\$0.0	\$0.0	\$137.0	\$485.0	\$622.0	\$685.0	\$2,425.0	\$3,110.0
Police Court - Exterior	002	Exterior	Flood Lights (Assume 400W MH)	6	2748	2.748	4380	12036.24	\$1,877.7	Replace 400W Fixture with Induction Light Fixture	6	1290	1.29	4380	4380	5650.2	5650.2	None Proposed	0	1.458	6386.04	996.2	\$0.0	\$485.0	\$137.0	\$0.0	\$0.0	\$137.0	\$485.0	\$622.0	\$822.0	\$2,910.0	\$3,732.0
Police Court - Exterior	002	Exterior	Flood Lights (Assume 400W MH)	6	2748	2.748	4380	12036.24	\$1,877.7	Replace 400W Fixture with Induction Light Fixture	6	1290	1.29	4380	4380	5650.2	5650.2	None Proposed	0	1.458	6386.04	996.2	\$0.0	\$485.0	\$137.0	\$0.0	\$0.0	\$137.0	\$485.0	\$622.0	\$822.0	\$2,910.0	\$3,732.0
Police Court - Exterior	002	Exterior	Flood Lights (Assume 400W MH)	1	458	0.458	4380	2006.04	\$312.9	Replace 400W Fixture with Induction Light Fixture	1	215	0.215	4380	4380	941.7	941.7	None Proposed	0	0.243	1064.34	166.0	\$0.0	\$485.0	\$137.0	\$0.0	\$0.0	\$137.0	\$485.0	\$622.0	\$137.0	\$485.0	\$622.0
Police Court - Interior	000	Boiler Room	60W Incandescent Fixture	2	120	0.12	500	60	\$9.4	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	500	350	13	9.1	Ceiling Mounted Occupancy Sensor	1	0.094	50.9	7.9	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$113.5	\$113.0	\$226.5
Police Court - Interior	000	Boiler Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$15.8	None Proposed	4	202.8	0.2028	500	350	101.4	70.98	Ceiling Mounted Occupancy Sensor	1	0	30.42	4.7	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Police Court - Interior	000	Electrical Room	13W CFL Fixture	3	39	0.039	500	19.5	\$3.0	None Proposed	3	39	0.039	500	350	19.5	13.65	Ceiling Mounted Occupancy Sensor	1	0	5.85	0.9	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Police Court - Interior	000	Electrical Room	60W Incandescent Fixture	9	540	0.54	500	270	\$42.1	Replace 60W Incandescent Fixture with 13W CFL	9	117	0.117	500	350	58.5	40.95	Ceiling Mounted Occupancy Sensor	1	0.423	229.05	35.7	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$253.5	\$148.0	\$401.5
Police Court - Interior	000	Garage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	37	1875.9	1.8759	3500	6565.65	\$1,024.2	None Proposed	37	1875.9	1.8759	3500	3500	6565.65	6565.65	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	000	Hallway	60W Incandescent Fixture	5	300	0.3	3500	1050	\$163.8	Replace 60W Incandescent Fixture with 13W CFL	5	65	0.065	3500	3500	227.5	227.5	None Proposed	0	0.235	822.5	128.3	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$100.0	\$25.0	\$125.0
Police Court - Interior	000	Maintenance Office	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	171.2	0.1712	3500	599.2	\$93.5	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	2	97.2	0.0972	3500	3500	340.2	340.2	None Proposed	0	0.074	259	40.4	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$130.0	\$160.0	\$290.0
Police Court - Interior	000	Maintenance Office	60W Incandescent Fixture	2	120	0.12	3500	420	\$65.5	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	3500	3500	91	91	None Proposed	0	0.094	329	51.3	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$40.0	\$10.0	\$50.0
Police Court - Interior	000	Phone Room	60W Incandescent Fixture	2	120	0.12	500	60	\$9.4	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	500	500	13	13	None Proposed	0	0.094	47	7.3	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$40.0	\$10.0	\$50.0
Police Court - Interior	000	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	456.3	0.4563	500	228.15	\$35.6	None Proposed	9	456.3	0.4563	500	350	228.15	159.705	Ceiling Mounted Occupancy Sensor	1	0	68.445	10.7	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Police Court - Interior	001	Admin Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3500	1232	\$192.2	None Proposed	4	352	0.352	3500	3500	1232	1232	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	\$11.9	None Proposed	3	152.1	0.1521	500	500	76.05	76.05	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	88	0.088	500	44	\$6.9	None Proposed	1	88	0.088	500	500	44	44	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Break Room	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Break Room	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3500	1848	\$288.3	None Proposed	6	528	0.528	3500	3500	1848	1848	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Closet	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	500	12.7	\$2.0	None Proposed	1	25.4	0.0254	500	350	12.7	8.89	Ceiling Mounted Occupancy Sensor	1	0	3.81	0.6	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Police Court - Interior	001	Communications	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	3500	1774.5	\$276.8	None Proposed	10	507	0.507	3500	3500	1774.5	1774.5	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Conference Room	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3500	1232	\$192.2	None Proposed	4	352	0.352	3500	3500	1232	1232	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Court Room	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3500	1848	\$288.3	None Proposed	6	528	0.528	3500	3500	1848	1848	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Decon Room	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	3500	88.9	\$13.9	None Proposed	1	25.4	0.0254	3500	3500	88.9	88.9	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Detectives	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3500	1232	\$192.2	None Proposed	4	352	0.352	3500	3500	1232	1232	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Detectives	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	336	0.336	3500	1176	\$183.5	None Proposed	3	336	0.336	3500	3500	1176	1176	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Electrical	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	500	12.7	\$2.0	None Proposed	1	25.4	0.0254	500	350	12.7	8.89	Ceiling Mounted Occupancy Sensor	1	0	3.81	0.6	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Police Court - Interior	001	Electrical</																															

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Blub (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Police Court - Interior	001	Intake Garage	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	3500	88.9	\$13.9	None Proposed	1	25.4	0.0254	3500	3500	88.9	88.9	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Interior	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3500	784	\$122.3	None Proposed	2	224	0.224	3500	3500	784	784	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Interior	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	3500	784	\$122.3	None Proposed	2	224	0.224	3500	3500	784	784	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Interview A	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Interview B	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	264	0.264	3500	924	\$144.1	None Proposed	3	264	0.264	3500	3500	924	924	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Janitors Closet	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	500	12.7	\$2.0	None Proposed	1	25.4	0.0254	500	500	12.7	12.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Janitors Closet	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	500	12.7	\$2.0	None Proposed	1	25.4	0.0254	500	500	12.7	12.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Lobby	42W CFL Fixture	21	1029	1.029	3500	3601.5	\$561.8	None Proposed	21	1029	1.029	3500	3500	3601.5	3601.5	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Lobby	42W CFL Fixture	20	980	0.98	3500	3430	\$535.1	None Proposed	20	980	0.98	3500	3500	3430	3430	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Lobby	BIAX Fixtures	4	220	0.22	3500	770	\$120.1	None Proposed	4	220	0.22	3500	3500	770	770	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Male Cells	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	7	177.8	0.1778	500	88.9	\$13.9	None Proposed	7	177.8	0.1778	500	500	88.9	88.9	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Male Cells	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	500	264	\$41.2	None Proposed	6	528	0.528	500	500	264	264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Mens Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	88	0.088	500	44	\$6.9	None Proposed	1	88	0.088	500	500	44	44	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Mens Bathroom	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	500	112	\$17.5	None Proposed	2	224	0.224	500	500	112	112	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Mens Locker Room	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	23	2024	2.024	500	1012	\$157.9	None Proposed	23	2024	2.024	500	500	1012	1012	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Mens Locker Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$15.8	None Proposed	4	202.8	0.2028	500	500	101.4	101.4	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3500	2772	\$432.4	None Proposed	9	792	0.792	3500	3500	2772	2772	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3500	1232	\$192.2	None Proposed	4	352	0.352	3500	3500	1232	1232	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	264	0.264	3500	924	\$144.1	None Proposed	3	264	0.264	3500	3500	924	924	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Offices	BIAX Fixtures	4	220	0.22	3500	770	\$120.1	None Proposed	4	220	0.22	3500	3500	770	770	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Offices	BIAX Fixtures	16	880	0.88	3500	3080	\$480.5	None Proposed	16	880	0.88	3500	3500	3080	3080	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Polygraph	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Polygraph	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Polygraph	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3500	354.9	\$55.4	None Proposed	2	101.4	0.1014	3500	3500	354.9	354.9	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Records	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3500	1848	\$288.3	None Proposed	6	528	0.528	3500	3500	1848	1848	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Records	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3500	532.35	\$83.0	None Proposed	3	152.1	0.1521	3500	3500	532.35	532.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Records Litenent	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Records Litenent	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	760.5	0.7605	3500	2661.75	\$415.2	None Proposed	15	760.5	0.7605	3500	3500	2661.75	2661.75	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Schedule Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3500	1232	\$192.2	None Proposed	4	352	0.352	3500	3500	1232	1232	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Schedule Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3500	1232	\$192.2	None Proposed	4	352	0.352	3500	3500	1232	1232	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Server	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3500	709.8	\$110.7	None Proposed	4	202.8	0.2028	3500	3500	709.8	709.8	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Shift	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Stairwell	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3500	532.35	\$83.0	None Proposed	3	152.1	0.1521	3500	3500	532.35	532.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Storage	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	500	12.7	\$2.0	None Proposed	1	25.4	0.0254	500	350	12.7	8.89	Ceiling Mounted Occupancy Sensor	1	0	3.81	0.6	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Police Court - Interior	001	Storage	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	500	12.7	\$2.0	None Proposed	1	25.4	0.0254	500	350	12.7	8.89	Ceiling Mounted Occupancy Sensor	1	0	3.81	0.6	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Police Court - Interior	001	Storage	60W Incandescent Fixture	2	120	0.12	500	60	\$9.4	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	500	350	13	9.1	Ceiling Mounted Occupancy Sensor	1	0.094	50.9	7.9	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$113.5	\$113.0	\$226.5
Police Court - Interior	001	Technology	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3500	1232	\$192.2	None Proposed	4	352	0.352	3500	3500	1232	1232	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Test Room 91	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Traffic	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	8	704	0.704	3500	2464	\$384.4	None Proposed	8	704	0.704	3500	3500	2464	2464	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Training Room	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	4	352	0.352	3500	1232	\$192.2	None Proposed	4	352	0.352	3500	3500	1232	1232	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Womens Bathroom	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	1	88	0.088	500	44	\$6.9	None Proposed	1	88	0.088	500	500	44	44	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	001	Womens Bathroom	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	500	112	\$17.5	None Proposed																							

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Police Court - Interior	002	Family Relations	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	3500	2772	\$432.4	None Proposed	9	792	0.792	3500	3500	2772	2772	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Family Relations	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	20	1760	1.76	3500	6160	\$961.0	None Proposed	20	1760	1.76	3500	3500	6160	6160	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Family Relations	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3500	354.9	\$55.4	None Proposed	2	101.4	0.1014	3500	3500	354.9	354.9	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Family Relations	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Family Relations	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3500	354.9	\$55.4	None Proposed	2	101.4	0.1014	3500	3500	354.9	354.9	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Hallway	42W CFL Fixture	45	2205	2.205	3500	7717.5	\$1,203.9	None Proposed	45	2205	2.205	3500	3500	7717.5	7717.5	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Hallway	150W Incandescent Fixture	7	1050	1.05	3500	3675	\$573.3	Replace 150W Incandescent Fixture with 25W CFL	7	175	0.175	3500	3500	612.5	612.5	None Proposed	0	0.875	3062.5	477.8	\$0.0	\$7.0	\$20.0	\$0.0	\$0.0	\$20.0	\$7.0	\$27.0	\$140.0	\$49.0	\$189.0
Police Court - Interior	002	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3500	532.35	\$83.0	None Proposed	3	152.1	0.1521	3500	3500	532.35	532.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	557.7	0.5577	3500	1951.95	\$304.5	None Proposed	11	557.7	0.5577	3500	3500	1951.95	1951.95	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	3500	1064.7	\$166.1	None Proposed	6	304.2	0.3042	3500	3500	1064.7	1064.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Hallway	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3500	709.8	\$110.7	None Proposed	4	202.8	0.2028	3500	3500	709.8	709.8	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	HVAC Room	60W Incandescent Fixture	2	120	0.12	3500	420	\$65.5	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	3500	2450	91	63.7	Ceiling Mounted Occupancy Sensor	1	0.094	356.3	55.6	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$113.5	\$113.0	\$226.5
Police Court - Interior	002	HVAC Room	42W CFL Fixture	1	49	0.049	3500	171.5	\$26.8	None Proposed	1	49	0.049	3500	2450	171.5	120.05	Ceiling Mounted Occupancy Sensor	1	0	51.45	8.0	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Police Court - Interior	002	HVAC Room	150W Incandescent Fixture	10	1500	1.5	3500	5250	\$819.0	Replace 150W Incandescent Fixture with 25W CFL	10	250	0.25	3500	2450	875	612.5	Ceiling Mounted Occupancy Sensor	1	1.25	4637.5	723.5	\$0.0	\$7.0	\$20.0	\$103.0	\$73.5	\$20.0	\$7.0	\$27.0	\$273.5	\$173.0	\$446.5
Police Court - Interior	002	Judge #1	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	3500	1848	\$288.3	None Proposed	6	528	0.528	3500	3500	1848	1848	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Judge Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Judge Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3500	354.9	\$55.4	None Proposed	2	101.4	0.1014	3500	3500	354.9	354.9	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Judge Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3500	177.45	\$27.7	None Proposed	1	50.7	0.0507	3500	3500	177.45	177.45	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Judge Office	60W Incandescent Fixture	3	180	0.18	3500	630	\$98.3	Replace 60W Incandescent Fixture with 13W CFL	3	39	0.039	3500	3500	136.5	136.5	None Proposed	0	0.141	493.5	77.0	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$60.0	\$15.0	\$75.0
Police Court - Interior	002	Jury Room	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	12	1056	1.056	3500	3696	\$576.6	None Proposed	12	1056	1.056	3500	3500	3696	3696	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Jury Room	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	15	1320	1.32	3500	4620	\$720.7	None Proposed	15	1320	1.32	3500	3500	4620	4620	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Jury Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3500	354.9	\$55.4	None Proposed	2	101.4	0.1014	3500	3500	354.9	354.9	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Mens Bathroom	42W CFL Fixture	9	441	0.441	500	220.5	\$34.4	None Proposed	9	441	0.441	500	500	220.5	220.5	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Mens Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$7.9	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Mens Bathroom	60W Incandescent Fixture	3	180	0.18	500	90	\$14.0	Replace 60W Incandescent Fixture with 13W CFL	3	39	0.039	500	500	19.5	19.5	None Proposed	0	0.141	70.5	11.0	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$60.0	\$15.0	\$75.0
Police Court - Interior	002	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	354.9	0.3549	3500	1242.15	\$193.8	None Proposed	7	354.9	0.3549	3500	3500	1242.15	1242.15	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	42W CFL Fixture	38	1862	1.862	3500	6517	\$1,016.7	None Proposed	38	1862	1.862	3500	3500	6517	6517	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3500	354.9	\$55.4	None Proposed	2	101.4	0.1014	3500	3500	354.9	354.9	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3500	177.45	\$27.7	None Proposed	1	50.7	0.0507	3500	3500	177.45	177.45	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3500	177.45	\$27.7	None Proposed	1	50.7	0.0507	3500	3500	177.45	177.45	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3500	354.9	\$55.4	None Proposed	2	101.4	0.1014	3500	3500	354.9	354.9	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	264	0.264	3500	924	\$144.1	None Proposed	3	264	0.264	3500	3500	924	924	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3500	354.9	\$55.4	None Proposed	2	101.4	0.1014	3500	3500	354.9	354.9	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3500	709.8	\$110.7	None Proposed	4	202.8	0.2028	3500	3500	709.8	709.8	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	2	176	0.176	3500	616	\$96.1	None Proposed	2	176	0.176	3500	3500	616	616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	3500	532.35	\$83.0	None Proposed	3	152.1	0.1521	3500	3500																		

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Police Court - Interior	002	Womens Bathroom	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$7.9	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Police Court - Interior	002	Womens Bathroom	60W Incandescent Fixture	3	180	0.18	500	90	\$14.0	Replace 60W Incandescent Fixture with 13W CFL	3	39	0.039	500	500	19.5	19.5	None Proposed	0	0.141	70.5	11.0	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$60.0	\$15.0	\$75.0
Water Department - #5 Well House - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	1	90	0.09	4380	394.2	\$62.5	Replace 70W Fixture with Induction Light Fixture	1	44	0.044	4380	4380	192.72	192.72	None Proposed	0	0.046	201.48	31.9	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$137.0	\$380.0	\$517.0
Water Department - #5 Well House - Interior	001	Interior	60W Incandescent Fixture	2	120	0.12	500	60	\$9.5	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	500	500	13	13	None Proposed	0	0.094	47	7.4	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$40.0	\$10.0	\$50.0
Water Department - Chemical and Control - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	1	90	0.09	4380	394.2	\$117.1	Replace 70W Fixture with Induction Light Fixture	1	44	0.044	4380	4380	192.72	192.72	None Proposed	0	0.046	201.48	59.9	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$137.0	\$380.0	\$517.0
Water Department - Chemical and Control - Interior	001	Interior	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.0856	500	42.8	\$12.7	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf., 0.78 Ballast Factor Ballast	1	48.6	0.0486	500	500	24.3	24.3	None Proposed	0	0.037	18.5	5.5	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0
Water Department - Generator - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	1	90	0.09	4380	394.2	\$100.5	Replace 70W Fixture with Induction Light Fixture	1	44	0.044	4380	4380	192.72	192.72	None Proposed	0	0.046	201.48	51.4	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$137.0	\$380.0	\$517.0
Water Department - Generator - Interior	001	Interior	8' T12 Fixture w/ 2-T12 Lamps	2	454	0.454	500	227	\$57.9	Replace 8' T12 Fixture with 1 Tandem Double-Length 2-T8 Lamp Fixture	2	240	0.24	500	500	120	120	None Proposed	0	0.214	107	27.3	\$65.1	\$105.0	\$93.0	\$0.0	\$0.0	\$93.0	\$170.1	\$263.1	\$186.0	\$340.2	\$526.2

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Bristol Fire - Fire HQ - Interior	001	Apparatus Bay	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	9	1008	1.008	8760	8830.08	\$1,546.1	None Proposed	9	1008	1.008	8760	8760	8830.08	8830.08	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 2 - Exterior	001	Exterior	500W Quartz Fixture	4	2000	2	4380	8760	\$1,668.8	Replace 500W Fixture with Induction Light Fixture	4	440	0.44	4380	4380	1927.2	1927.2	None Proposed	0	1.56	6832.8	1,301.6	\$0.0	\$485.0	\$137.0	\$0.0	\$0.0	\$137.0	\$485.0	\$622.0	\$548.0	\$1,940.0	\$2,488.0
Bristol Fire - Engine 2 - Exterior	001	Exterior	13W CFL Fixture	2	26	0.026	4380	113.88	\$21.7	None Proposed	2	26	0.026	4380	4380	113.88	113.88	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 2 - Interior	001	TV Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$169.2	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 2 - Interior	001	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$169.2	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 2 - Interior	001	Kitchen	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$169.2	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 2 - Interior	001	Bathroom	2' 17W Fluorescent Fixture	1	15	0.015	500	7.5	\$1.4	None Proposed	1	15	0.015	500	500	7.5	7.5	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 2 - Interior	001	Bathroom	60W Incandescent Fixture	1	60	0.06	500	30	\$5.7	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.047	23.5	4.5	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Bristol Fire - Engine 2 - Interior	001	Hallway	60W Incandescent Fixture	1	60	0.06	8760	525.6	\$100.1	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	8760	8760	113.88	113.88	None Proposed	0	0.047	411.72	78.4	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Bristol Fire - Engine 2 - Interior	001	Bedroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$169.2	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 2 - Interior	001	Garage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	33	1673.1	1.6731	8760	14656.356	\$2,792.0	None Proposed	33	1673.1	1.6731	8760	8760	14656.356	14656.356	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 3 - Exterior	001	Exterior	500W Quartz Fixture	5	2500	2.5	4380	10950	\$2,213.0	Replace 500W Fixture with Induction Light Fixture	5	550	0.55	4380	4380	2409	2409	None Proposed	0	1.95	8541	1,726.1	\$0.0	\$485.0	\$137.0	\$0.0	\$0.0	\$137.0	\$485.0	\$622.0	\$685.0	\$2,425.0	\$3,110.0
Bristol Fire - Engine 3 - Interior	001	TV Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$179.5	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 3 - Interior	001	TV Room	60W Incandescent Fixture	1	60	0.06	8760	525.6	\$106.2	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	8760	8760	113.88	113.88	None Proposed	0	0.047	411.72	83.2	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Bristol Fire - Engine 3 - Interior	001	TV Room	60W Incandescent Fixture	1	60	0.06	8760	525.6	\$106.2	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	8760	8760	113.88	113.88	None Proposed	0	0.047	411.72	83.2	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Bristol Fire - Engine 3 - Interior	001	Hallway	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	2	50.8	0.0508	8760	445.008	\$89.9	None Proposed	2	50.8	0.0508	8760	8760	445.008	445.008	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 3 - Interior	001	Kitchen	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$179.5	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 3 - Interior	001	Closet	60W Incandescent Fixture	1	60	0.06	500	30	\$6.1	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0.047	25.45	5.1	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$93.5	\$108.0	\$201.5
Bristol Fire - Engine 3 - Interior	001	Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$5.1	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 3 - Interior	001	Bathroom	2' 17W Fluorescent Fixture	1	15	0.015	500	7.5	\$1.5	None Proposed	1	15	0.015	500	500	7.5	7.5	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 3 - Interior	001	Bedroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$179.5	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 3 - Interior	001	Garage	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	24	609.6	0.6096	8760	5340.096	\$1,079.2	None Proposed	24	609.6	0.6096	8760	8760	5340.096	5340.096	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Engine 3 - Interior	001	Closet	60W Incandescent Fixture	1	60	0.06	500	30	\$6.1	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0.047	25.45	5.1	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$93.5	\$108.0	\$201.5
Bristol Fire - Engine 3 - Interior	001	Closet	60W Incandescent Fixture	1	60	0.06	500	30	\$6.1	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0.047	25.45	5.1	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$93.5	\$108.0	\$201.5
Bristol Fire - Fire HQ - Exterior	000	Exterior	Exterior Wall Packs (Assume 70w)	6	540	0.54	4380	2365.2	\$414.1	Replace 70W Fixture with Induction Light Fixture	6	264	0.264	4380	4380	1156.32	1156.32	None Proposed	0	0.276	1208.88	211.7	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$822.0	\$2,280.0	\$3,102.0
Bristol Fire - Fire HQ - Interior	001	Apparatus Bay 2	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	8760	5886.72	\$1,030.8	None Proposed	6	672	0.672	8760	8760	5886.72	5886.72	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Fire HQ - Interior	001	Copy Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	2340	355.914	\$62.3	None Proposed	3	152.1	0.1521	2340	2340	355.914	355.914	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Fire HQ - Interior	001	Copy Room	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	336	0.336	2340	786.24	\$137.7	None Proposed	3	336	0.336	2340	2340	786.24	786.24	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Fire HQ - Interior	001	Electrical Room	60W Incandescent Fixture	4	240	0.24	500	120	\$21.0	Replace 60W Incandescent Fixture with 13W CFL	4	52	0.052	500	350	26	18.2	Ceiling Mounted Occupancy Sensor	1	0.188	101.8	17.8	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$153.5	\$123.0	\$276.5
Bristol Fire - Fire HQ - Interior	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	2340	355.914	\$62.3	None Proposed	3	152.1	0.1521	2340	2340	355.914	355.914	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Fire HQ - Interior	001	Offices	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	2340	1572.48	\$275.3	None Proposed	6	672	0.672	2340	2340	1572.48	1572.48	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Fire HQ - Interior	001	Offices	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	2340	524.16	\$91.8	None Proposed	2	224	0.224	2340	2340	524.16	524.16	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Fire HQ - Interior	001	Offices	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	8	896	0.896	2340	2096.64	\$367.1	None Proposed	8	896	0.896	2340	2340	2096.64	2096.64	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Fire HQ - Interior	001	Stairwell	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	8760	444.132	\$77.8	None Proposed	1	50.7	0.0507	8760	8760	444.132	444.132	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Fire HQ - Interior	001	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$17.8	None Proposed	4	202.8	0.2028	500	350	101.4	70.98	Ceiling Mounted Occupancy Sensor	1	0	30.42	5.3	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Bristol Fire - Fire HQ - Interior	001	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$17.8	None Proposed	4	202.8	0.2028	500	350	101.4	70.98	Ceiling Mounted Occupancy Sensor	1	0	30.42	5.3	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Bristol Fire - Fire HQ - Interior	001	Storage	60W Incandescent Fixture	1	60	0.06	500	30	\$5.3	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0.047	25.45	4.5	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$93.5	\$108.0	\$201.5
Bristol Fire - Fire HQ - Interior	002	Bathroom	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	500	224	\$39.2	None Proposed	4	448	0.448	500	500	224	224	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Fire HQ - Interior	002	Bathroom	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	500	12.7	\$2.2	None Proposed	1	25.4	0.0254	500	500	12.7	12.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Bristol Fire - Fire HQ - Interior	002	Bathrooms																															

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	
Parks and Recreation - Bathhouse - Interior	001	Bathhouse	60W Incandescent Fixture	1	60	0.06	500	30	\$9.1	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.047	23.5	7.2	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0	
Parks and Recreation - Bathhouse - Interior	001	Bathhouse	60W Incandescent Fixture	1	60	0.06	500	30	\$9.1	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.047	23.5	7.2	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0	
Parks and Recreation - Bathhouse - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	1	90	0.09	4360	392.4	\$119.5	Replace 70W Fixture with Induction Light Fixture	1	44	0.044	4360	4360	191.84	191.84	None Proposed	0	0.046	200.56	61.1	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$137.0	\$380.0	\$517.0	
Parks and Recreation - Muzzy Field - Exterior	000	Exterior	Flood Lights (Assume 400W MH)	4	1832	1.832	500	916	\$519.9	Replace 400W Fixture with Induction Light Fixture	4	860	0.86	500	500	430	430	None Proposed	0	0.972	486	275.9	\$0.0	\$485.0	\$137.0	\$0.0	\$0.0	\$137.0	\$485.0	\$622.0	\$548.0	\$1,940.0	\$2,488.0	
Parks and Recreation - Muzzy Field - Exterior	000	Exterior	250W MH Fixture	3	855	0.855	500	427.5	\$242.6	Replace 250W Fixture with Induction Light Fixture	3	330	0.33	500	500	165	165	None Proposed	0	0.525	262.5	149.0	\$0.0	\$390.0	\$137.0	\$0.0	\$0.0	\$137.0	\$390.0	\$527.0	\$411.0	\$1,170.0	\$1,581.0	
Parks and Recreation - Muzzy Field - Interior	001	Electrical Room	60W Incandescent Fixture	1	60	0.06	500	30	\$17.0	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0.047	25.45	14.4	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$93.5	\$108.0	\$201.5	
Parks and Recreation - Muzzy Field - Interior	001	Locker Room	2x4 Fixtures w/ 4-T12 Lamp Fixture w/ Magnetic Ballast	10	1712	1.712	500	856	\$485.9	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	10	973	0.973	500	500	486.5	486.5	None Proposed	0	0.739	369.5	209.7	\$105.0	\$20.0	\$65.0	\$0.0	\$0.0	\$65.0	\$125.0	\$190.0	\$650.0	\$1,250.0	\$1,900.0	
Parks and Recreation - Muzzy Field - Interior	001	Locker Room	2x4 Fixtures w/ 4-T12 Lamp Fixture w/ Magnetic Ballast	2	342.4	0.3424	500	171.2	\$97.2	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	2	194.6	0.1946	500	500	97.3	97.3	None Proposed	0	0.1478	73.9	41.9	\$105.0	\$20.0	\$65.0	\$0.0	\$0.0	\$65.0	\$125.0	\$190.0	\$130.0	\$250.0	\$380.0	
Parks and Recreation - Muzzy Field - Interior	001	Locker Room	8' T12 Fixture w/ 2-T12 Lamps	7	1589	1.589	500	794.5	\$451.0	Replace 8' T12 Fixture with 1 Tandem Double-Length 2-T8 Lamp Fixture	7	840	0.84	500	500	420	420	None Proposed	0	0.749	374.5	212.6	\$65.1	\$105.0	\$93.0	\$0.0	\$0.0	\$93.0	\$170.1	\$263.1	\$651.0	\$1,190.7	\$1,841.7	
Parks and Recreation - Muzzy Field - Interior	011	Concession Stand	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	3	256.8	0.2568	500	128.4	\$72.9	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	3	145.8	0.1458	500	500	72.9	72.9	None Proposed	0	0.111	55.5	31.5	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$195.0	\$240.0	\$435.0	
Parks and Recreation - Page Park Pavilion - Exterior	000	Exterior	Exterior Wall Packs (Assume 70w)	2	180	0.18	4380	788.4	\$351.1	Replace 70W Fixture with Induction Light Fixture	2	88	0.088	4380	4380	385.44	385.44	None Proposed	0	0.092	402.96	179.4	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$274.0	\$760.0	\$1,034.0	
Parks and Recreation - Page Park Pavilion - Interior	001	Pavilion	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	8	684.8	0.6848	500	342.4	\$152.5	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	8	388.8	0.3888	500	500	194.4	194.4	None Proposed	0	0.296	148	65.9	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$520.0	\$640.0	\$1,160.0	
Parks and Recreation - Page Park Pavilion - Interior	001	Pavilion	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	6	513.6	0.5136	500	256.8	\$114.4	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	6	291.6	0.2916	500	500	145.8	145.8	None Proposed	0	0.222	111	49.4	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$390.0	\$480.0	\$870.0	
Parks and Recreation - Page Park Pavilion - Interior	001	Pavilion	1x4 Fixtures w/ 1-T12 Lamp Fixture w/ Magnetic Ballast	1	42.8	0.0428	500	21.4	\$9.5	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	24.32	0.02432	500	500	12.16	12.16	None Proposed	0	0.01848	9.24	4.1	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0	
Parks and Recreation - Page Park Pavilion - Interior	001	Pavilion	1x4 Fixtures w/ 1-T12 Lamp Fixture w/ Magnetic Ballast	1	42.8	0.0428	500	21.4	\$9.5	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	24.32	0.02432	500	500	12.16	12.16	None Proposed	0	0.01848	9.24	4.1	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0	
Parks and Recreation - Page Park Pavilion - Interior	001	Pavilion	1x4 Fixtures w/ 1-T12 Lamp Fixture w/ Magnetic Ballast	1	42.8	0.0428	500	21.4	\$9.5	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	24.32	0.02432	500	500	12.16	12.16	None Proposed	0	0.01848	9.24	4.1	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0	
Parks and Recreation - Page Park Pavilion - Interior	001	Pavilion	1x4 Fixtures w/ 1-T12 Lamp Fixture w/ Magnetic Ballast	1	42.8	0.0428	500	21.4	\$9.5	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	24.32	0.02432	500	500	12.16	12.16	None Proposed	0	0.01848	9.24	4.1	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0	
Parks and Recreation - Page Park Pavilion - Interior	001	Pavilion	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	171.2	0.1712	500	85.6	\$38.1	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	2	97.2	0.0972	500	500	48.6	48.6	None Proposed	0	0.074	37	18.5	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$130.0	\$160.0	\$290.0	
Parks and Recreation - Page Park Pavilion - Interior	001	Pavilion	60W Incandescent Fixture	2	120	0.12	500	60	\$26.7	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	500	500	13	13	None Proposed	0	0.094	47	20.9	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$40.0	\$10.0	\$50.0	
Parks and Recreation - Recreation Building - Exterior	086	Exterior	Exterior Wall Packs (Assume 70w)	1	90	0.09	4380	394.2	\$344.3	Replace 70W Fixture with Induction Light Fixture	1	44	0.044	4380	4380	192.72	192.72	None Proposed	0	0.046	201.48	176.0	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$137.0	\$380.0	\$517.0	
Parks and Recreation - Recreation Building - Interior	001	Recreation Building	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	456.3	0.4563	500	228.15	\$199.2	None Proposed	9	456.3	0.4563	500	500	228.15	228.15	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Parks and Recreation - Recreation Building - Interior	001	Recreation Building	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$44.3	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Parks and Recreation - Recreation Building - Interior	001	Recreation Building	60W Incandescent Fixture	1	60	0.06	500	30	\$26.2	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.047	23.5	20.5	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0	
Parks and Recreation - Recreation Building - Interior	002	Recreation Building	60W Incandescent Fixture	5	300	0.3	500	150	\$131.0	Replace 60W Incandescent Fixture with 13W CFL	5	65	0.065	500	500	32.5	32.5	None Proposed	0	0.235	117.5	102.6	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$100.0	\$25.0	\$125.0	
Parks and Recreation - Recreation Building - Interior	002	Recreation Building	150W Incandescent Fixture	2	300	0.3	500	150	\$131.0	Replace 150W Incandescent Fixture with 25W CFL	2	50	0.05	500	500	25	25	None Proposed	0	0.25	125	109.2	\$0.0	\$7.0	\$20.0	\$0.0	\$0.0	\$20.0	\$7.0	\$27.0	\$40.0	\$14.0	\$54.0	
Parks and Recreation - Rockwell Park - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	2	180	0.18	500	90	\$28.0	Replace 70W Fixture with Induction Light Fixture	2	88	0.088	500	500	44	44	None Proposed	0	0.092	46	14.3	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$274.0	\$760.0	\$1,034.0	
Parks and Recreation - Rockwell Park - Interior	001	Bathroom	8' T12 Fixture w/ 2-T12 Lamps	2	454	0.454	500	227	\$70.6	Replace 8' T12 Fixture with 1 Tandem Double-Length 2-T8 Lamp Fixture	2	240	0.24	500	500	120	120	None Proposed	0	0.214	107	33.3	\$65.1	\$105.0	\$93.0	\$0.0	\$0.0	\$93.0	\$170.1	\$263.1	\$186.0	\$340.2	\$526.2	
Parks and Recreation - Rockwell Park - Interior	001	Bathroom	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.0856	500	42.8	\$13.3	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	48.6	0.0486	500	500	24.3	24.3	None Proposed	0	0.037	18.5	5.7	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0	
Parks and Recreation - Rockwell Park - Interior	001	Electrical Room	8' T12 Fixture w/ 2-T12 Lamps	3	681	0.681	500	340.5	\$105.8	Replace 8' T12 Fixture with 1 Tandem Double-Length 2-T8 Lamp Fixture	3	360	0.36	500	350	180	126	Ceiling Mounted Occupancy Sensor	1	0.321	214.5	66.7	\$65.1	\$105.0	\$93.0	\$103.0	\$73.5	\$93.0	\$170.1	\$263.1	\$352.5	\$613.3	\$965.8	
Parks and Recreation - Rockwell Park - Interior	001	Garage	8' T12 Fixture w/ 2-T12 Lamps	2	454	0.454	500	227	\$70.6	Replace 8' T12 Fixture with 1 Tandem Double-Length 2-T8 Lamp Fixture	2	240	0.24	500	500	120	120	None Proposed	0	0.214	107	33.3	\$65.1	\$105.0	\$93.0	\$0.0	\$0.0	\$93.0	\$170.1	\$263.1	\$186.0	\$340.2	\$526.2	
Parks and Recreation - Rockwell Park - Interior	001	Garage	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.0856	500	42.8	\$13.3	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	48.6	0.0486	500	500	24.3	24.3	None Proposed	0	0.037	18.5	5.7	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0	
Parks and Recreation - Rockwell Park - Interior	001	Garage	8' T12 Fixture w/ 2-T12 Lamps	3	681	0.681	500	340.5	\$105.8	Replace 8' T12 Fixture with 1 Tandem Double-Length 2-T8 Lamp Fixture	3	360	0.36	500	500	180	180	None Proposed	0	0.321	160.5	49.9	\$65.1	\$105.0	\$93.0	\$0.0	\$0.0	\$93.0	\$170.1	\$263.1	\$279.0	\$510.3	\$789.3	
Parks and Recreation - Rockwell Park - Interior	001	Garage	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.0856	500	42.8	\$13.3	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	48.6	0.0486	500	500	24.3	24.3	None Proposed	0	0.037	18.5	5.7	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0	
Parks and Recreation - Rockwell Park - Interior	001	Garage	8' T12 Fixture w/ 2-T12 Lamps	1	227	0.227	500	113.5	\$35.3	Replace 8' T12 Fixture with 1 Tandem Double-Length 2-T8 Lamp Fixture	1	120	0.12	500	500	60	60	None Proposed	0	0.107	53.5	16.6	\$65.1	\$105.0	\$93.0	\$0.0	\$0.0	\$93.0	\$170.1	\$263.1	\$93.0	\$170.1	\$263.1	
Parks and Recreation - Rockwell Park - Interior	001	Garage	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	171.2	0.1712	500	85.6	\$26.6	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	2	97.2	0.0972	500	500	48.6	48.6	None Proposed	0	0.074	37	11.5	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$130.0	\$160.0	\$290.0	
Parks and Recreation - Rockwell Park - Interior	001	Garage	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.0856	500	42.8	\$13.3	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	48.6	0.0486	500	500	24.3	24.3	None Proposed	0	0.037	18.5	5.7	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0	
Parks and Recreation - Rockwell Park - Interior	001	Storage	60W Incandescent Fixture	1	60	0.06	500	30	\$9.3	Replace 60W Incandescent Fixture with 1																								

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total			
Senior Center - Interior	001	13	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	1344	1.344	4368	5870.592	\$1,138.3	None Proposed	12	1344	1.344	4368	4368	5870.592	5870.592	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
Bristol Fire - Engine 4 - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	7	630	0.63	4380	2759.4	\$522.9	Replace 70W Fixture with Induction Light Fixture	7	308	0.308	4380	4380	1349.04	1349.04	None Proposed	0	0.322	1410.36	267.3	\$0.0	\$380.0	\$137.0	\$0.0	\$137.0	\$380.0	\$517.0	\$859.0	\$2,660.0	\$3,619.0				
Bristol Fire - Engine 4 - Interior	001	Bathroom	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$9.6	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
Bristol Fire - Engine 4 - Interior	001	Bathroom	1x4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	500	12.7	\$2.4	None Proposed	1	25.4	0.0254	500	500	12.7	12.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
Bristol Fire - Engine 4 - Interior	001	Classroom	1x4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	4	101.6	0.1016	8760	890.016	\$168.7	None Proposed	4	101.6	0.1016	8760	8760	890.016	890.016	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
Bristol Fire - Engine 4 - Interior	001	Closet	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.8	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.4	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5			
Bristol Fire - Engine 4 - Interior	001	Garage	1x4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	24	609.6	0.6096	8760	5340.096	\$1,011.9	None Proposed	24	609.6	0.6096	8760	8760	5340.096	5340.096	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
Bristol Fire - Engine 4 - Interior	001	Hallway	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$168.3	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Bristol Fire - Engine 4 - Interior	001	Kitchen	2x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$168.3	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Bristol Fire - Engine 4 - Interior	001	Lounge	2x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	8760	1332.396	\$252.5	None Proposed	3	152.1	0.1521	8760	8760	1332.396	1332.396	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Bristol Fire - Engine 4 - Interior	001	Office	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$168.3	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Bristol Fire - Engine 4 - Interior	001	Sleeping Room	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$168.3	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Bristol Fire - Engine 4 - Interior	001	Storage	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$9.6	None Proposed	2	101.4	0.1014	500	350	50.7	35.49	Ceiling Mounted Occupancy Sensor	1	0	15.21	2.9	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5			
Bristol Fire - Engine 5 - Exterior	001	Exterior	150W High Pressure Sodium Wall Pack	2	378	0.378	4380	1655.64	\$328.3	Replace 150W Fixture with Induction Light Fixture	2	180	0.18	4380	4380	788.4	788.4	None Proposed	0	0.198	867.24	172.0	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$274.0	\$760.0	\$1,034.0			
Bristol Fire - Engine 5 - Exterior	001	Exterior	500W Quartz Fixture	4	2000	2	4380	8760	\$1,737.1	Replace 500W Fixture with Induction Light Fixture	4	440	0.44	4380	4380	1927.2	1827.2	None Proposed	0	1.56	6832.8	1,354.9	\$0.0	\$485.0	\$137.0	\$0.0	\$0.0	\$137.0	\$485.0	\$622.0	\$548.0	\$1,940.0	\$2,488.0			
Bristol Fire - Engine 5 - Interior	001	Bathroom	2x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$5.0	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Bristol Fire - Engine 5 - Interior	001	Bathroom	1x4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	1	25.4	0.0254	500	12.7	\$2.5	None Proposed	1	25.4	0.0254	500	500	12.7	12.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Bristol Fire - Engine 5 - Interior	001	Bedroom	2x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$176.1	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Bristol Fire - Engine 5 - Interior	001	Bedroom	60W Incandescent Fixture	1	60	0.06	8760	525.6	\$104.2	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	8760	8760	113.88	113.88	None Proposed	0	0.047	411.72	81.6	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Bristol Fire - Engine 5 - Interior	001	Closet	13W CFL Fixture	1	13	0.013	500	6.5	\$1.3	None Proposed	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0	1.95	0.4	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5			
Bristol Fire - Engine 5 - Interior	001	Closet	60W Incandescent Fixture	1	60	0.06	500	30	\$5.9	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0.047	25.45	5.0	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$93.5	\$108.0	\$201.5			
Bristol Fire - Engine 5 - Interior	001	Closet	60W Incandescent Fixture	1	60	0.06	500	30	\$5.9	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0.047	25.45	5.0	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$93.5	\$108.0	\$201.5			
Bristol Fire - Engine 5 - Interior	001	Garage	1x4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	36	914.4	0.9144	8760	8010.144	\$1,588.4	None Proposed	36	914.4	0.9144	8760	8760	8010.144	8010.144	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Bristol Fire - Engine 5 - Interior	001	Hallway	1x4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	2	50.8	0.0508	8760	445.008	\$88.2	None Proposed	2	50.8	0.0508	8760	8760	445.008	445.008	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Bristol Fire - Engine 5 - Interior	001	Kitchen	2x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$176.1	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Bristol Fire - Engine 5 - Interior	001	Station	2x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$176.1	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Bristol Fire - Engine 5 - Interior	001	Station	2x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	8760	888.264	\$176.1	None Proposed	2	101.4	0.1014	8760	8760	888.264	888.264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Bristol Fire - Engine 5 - Interior	001	Station	60W Incandescent Fixture	1	60	0.06	8760	525.6	\$104.2	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	8760	8760	113.88	113.88	None Proposed	0	0.047	411.72	81.6	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Bristol Fire - Engine 5 - Interior	001	Station	60W Incandescent Fixture	1	60	0.06	8760	525.6	\$104.2	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	8760	8760	113.88	113.88	None Proposed	0	0.047	411.72	81.6	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Bristol Fire - Engine 5 - Interior	001	Weight Room	60W Incandescent Fixture	4	240	0.24	8760	2102.4	\$416.9	Replace 60W Incandescent Fixture with 13W CFL	4	52	0.052	8760	8760	455.52	455.52	None Proposed	0	0.188	1646.88	326.6	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$80.0	\$20.0	\$100.0			
Main Library - Exterior	000	Exterior	Double Headed 90W Halogen Fixture	2	360	0.36	4380	1576.8	\$274.8	Replace 180W Fixture with Induction Light Fixture	2	180	0.18	4380	4380	788.4	788.4	None Proposed	0	0.18	788.4	137.4	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$274.0	\$760.0	\$1,034.0			
Main Library - Exterior	000	Exterior	Exterior Wall Packs (Assume 70w)	3	270	0.27	4380	1182.6	\$206.1	Replace 70W Fixture with Induction Light Fixture	3	132	0.132	4380	4380	578.16	578.16	None Proposed	0	0.138	604.44	105.4	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$411.0	\$1,140.0	\$1,551.0			
Main Library - Interior	000	Bathroom	2x2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.4	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Main Library - Interior	000	Bathroom	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.4	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Main Library - Interior	000	Boiler Room	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	12	608.4	0.6084	500	304.2	\$53.0	None Proposed	12	608.4	0.6084	500	350	304.2	212.94	Ceiling Mounted Occupancy Sensor	1	0	91.26	15.9	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5			
Main Library - Interior	000	Chair Storage	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	500	224	\$39.0	None Proposed	4	448	0.448	500	500	224	224	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Main Library - Interior	000	Electrical Room	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$17.7	None Proposed	4	202.8	0.2028	500	350	101.4	70.98	Ceiling Mounted Occupancy Sensor	1	0	30.42	5.3	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5			
Main Library - Interior	000	Elevator Room	2x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.4	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor																		

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	
Main Library - Interior	000	Meeting Room 2	26W CFL Fixture	10	260	0.26	4056	1054.56	\$183.8	None Proposed	10	260	0.26	4056	4056	1054.56	1054.56	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Meeting Room 3	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	760.5	0.7605	4056	3084.588	\$537.6	None Proposed	15	760.5	0.7605	4056	4056	3084.588	3084.588	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Meeting Room 3	26W CFL Fixture	2	52	0.052	4056	210.912	\$36.8	None Proposed	2	52	0.052	4056	4056	210.912	210.912	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Mens Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	500	126.75	\$22.1	None Proposed	5	253.5	0.2535	500	500	126.75	126.75	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	88	0.088	4056	356.928	\$62.2	None Proposed	1	88	0.088	4056	4056	356.928	356.928	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	528	0.528	4056	2141.568	\$373.3	None Proposed	6	528	0.528	4056	4056	2141.568	2141.568	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Offices	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	4056	1028.196	\$179.2	None Proposed	5	253.5	0.2535	4056	4056	1028.196	1028.196	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	PR Manager	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	448	0.448	4056	1817.088	\$316.7	None Proposed	4	448	0.448	4056	4056	1817.088	1817.088	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Server Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$8.8	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Staff Lounge	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	704	0.704	4056	2855.424	\$497.7	None Proposed	8	704	0.704	4056	4056	2855.424	2855.424	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Stairwells	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	18	2016	2.016	4056	8176.896	\$1,425.2	None Proposed	18	2016	2.016	4056	4056	8176.896	8176.896	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Stairwells	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	4056	616.9176	\$107.5	None Proposed	3	152.1	0.1521	4056	4056	616.9176	616.9176	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Stairwells	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	4056	205.6392	\$35.8	None Proposed	1	50.7	0.0507	4056	4056	205.6392	205.6392	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Stairwells	26W CFL Fixture	5	130	0.13	4056	527.28	\$91.9	None Proposed	5	130	0.13	4056	4056	527.28	527.28	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Stairwells	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	456.3	0.4563	4056	1850.7528	\$322.6	None Proposed	9	456.3	0.4563	4056	4056	1850.7528	1850.7528	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Stairwells	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	456.3	0.4563	4056	1850.7528	\$322.6	None Proposed	9	456.3	0.4563	4056	4056	1850.7528	1850.7528	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Stairwells	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	4056	411.2784	\$71.7	None Proposed	2	101.4	0.1014	4056	4056	411.2784	411.2784	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Storage	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$8.8	None Proposed	2	101.4	0.1014	500	350	50.7	35.49	Ceiling Mounted Occupancy Sensor	1	0	15.21	2.7	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
Main Library - Interior	000	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	\$13.3	None Proposed	3	152.1	0.1521	500	350	76.05	53.235	Ceiling Mounted Occupancy Sensor	1	0	22.815	4.0	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
Main Library - Interior	000	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.4	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.3	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
Main Library - Interior	000	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.4	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.3	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
Main Library - Interior	000	Storage Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	500	152.1	\$26.5	None Proposed	6	304.2	0.3042	500	350	152.1	106.47	Ceiling Mounted Occupancy Sensor	1	0	45.63	8.0	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
Main Library - Interior	000	Storage Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$17.7	None Proposed	4	202.8	0.2028	500	350	101.4	70.98	Ceiling Mounted Occupancy Sensor	1	0	30.42	5.3	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
Main Library - Interior	000	Storage Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	500	253.5	\$44.2	None Proposed	10	507	0.507	500	350	253.5	177.45	Ceiling Mounted Occupancy Sensor	1	0	76.05	13.3	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
Main Library - Interior	000	Technical Services	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	19	963.3	0.9633	4056	3907.1448	\$681.0	None Proposed	19	963.3	0.9633	4056	4056	3907.1448	3907.1448	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Technical Services	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	4056	822.5568	\$143.4	None Proposed	4	202.8	0.2028	4056	4056	822.5568	822.5568	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Technical Services	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	4056	1817.088	\$316.7	None Proposed	4	448	0.448	4056	4056	1817.088	1817.088	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Vault	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	4056	411.2784	\$71.7	None Proposed	2	101.4	0.1014	4056	4056	411.2784	411.2784	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	000	Womens Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	500	126.75	\$22.1	None Proposed	5	253.5	0.2535	500	500	126.75	126.75	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	001	Library Floor	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	4056	1645.1136	\$286.7	None Proposed	8	405.6	0.4056	4056	4056	1645.1136	1645.1136	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	001	Library Floor	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	4056	1645.1136	\$286.7	None Proposed	8	405.6	0.4056	4056	4056	1645.1136	1645.1136	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	001	Library Floor	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	4056	616.9176	\$107.5	None Proposed	3	152.1	0.1521	4056	4056	616.9176	616.9176	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	001	Library Floor	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	4056	1233.8352	\$215.1	None Proposed	6	304.2	0.3042	4056	4056	1233.8352	1233.8352	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	001	Lobby	26W CFL Fixture	7	182	0.182	4056	738.192	\$128.7	None Proposed	7	182	0.182	4056	4056	738.192	738.192	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	001	Lobby	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	7	354.9	0.3549	4056	1439.4744	\$250.9	None Proposed	7	354.9	0.3549	4056	4056	1439.4744	1439.4744	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	001	Lobby	26W CFL Fixture	2	52	0.052	4056	210.912	\$36.8	None Proposed	2	52	0.052	4056	4056	210.912	210.912	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	001	Main Library	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	104	5272.8	5.2728	4056	21386.4768	\$3,727.7	None Proposed	104	5272.8	5.2728	4056	4056	21386.4768	21386.4768	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	001	Main Library	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	96	4867.2	4.8672	4056	19741.3632	\$3,440.9	None Proposed	96	4867.2	4.8672	4056	4056	19741.3632	19741.3632	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Main Library - Interior	001	Main Library	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	9	456.3	0.4563	4056	1850.7528	\$322.6	None Proposed	9	456.3	0.4563	4056	4056	1850.7528																		

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total		
Main Library - Interior	002	Study 2	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	4056	205.6392	\$35.8	None Proposed	1	50.7	0.0507	4056	4056	205.6392	205.6392	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Public Library - Exterior	000	Exterior	60W Incandescent Fixture	4	240	0.24	4380	1051.2	\$164.4	Replace 60W Incandescent Fixture with 13W CFL	4	52	0.052	4380	4380	227.76	227.76	None Proposed	0	0.188	823.44	128.8	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$80.0	\$20.0	\$100.0		
Public Library - Exterior	000	Exterior	Exterior Wall Packs (Assume 70w)	3	270	0.27	4380	1182.6	\$185.0	Replace 70W Fixture with Induction Light Fixture	3	132	0.132	4380	4380	578.16	578.16	None Proposed	0	0.138	604.44	94.5	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$411.0	\$1,140.0	\$1,551.0		
Public Library - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	2	180	0.18	4380	788.4	\$123.3	Replace 70W Fixture with Induction Light Fixture	2	88	0.088	4380	4380	385.44	385.44	None Proposed	0	0.092	402.96	63.0	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$274.0	\$760.0	\$1,034.0		
Public Library - Interior	001	Bathroom	60W Incandescent Fixture	1	60	0.06	500	30	\$4.7	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.047	23.5	3.7	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0		
Public Library - Interior	001	Copy Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	4056	411.2784	\$64.3	None Proposed	2	101.4	0.1014	4056	4056	411.2784	411.2784	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Public Library - Interior	001	Electrical Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$7.9	None Proposed	2	101.4	0.1014	500	350	50.7	35.49	Ceiling Mounted Occupancy Sensor	1	0	15.21	2.4	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5		
Public Library - Interior	001	Electrical Room	26W CFL Fixture	1	26	0.026	500	13	\$2.0	None Proposed	1	26	0.026	500	350	13	9.1	Ceiling Mounted Occupancy Sensor	1	0	3.9	0.6	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5		
Public Library - Interior	001	Hallway	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	4056	411.2784	\$64.3	None Proposed	2	101.4	0.1014	4056	4056	411.2784	411.2784	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Public Library - Interior	001	Hallway	26W CFL Fixture	7	182	0.182	4056	738.192	\$115.5	None Proposed	7	182	0.182	4056	4056	738.192	738.192	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Public Library - Interior	001	Kitchen	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	4056	908.544	\$142.1	None Proposed	2	224	0.224	4056	4056	908.544	908.544	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Public Library - Interior	001	Kitchen	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	4056	205.6392	\$32.2	None Proposed	1	50.7	0.0507	4056	4056	205.6392	205.6392	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Public Library - Interior	001	Main Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	67	3396.9	3.3969	4056	13777.8264	\$2,154.9	None Proposed	67	3396.9	3.3969	4056	4056	13777.8264	13777.8264	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Public Library - Interior	001	Main Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	128	6489.6	6.4896	4056	26321.8176	\$4,116.7	None Proposed	128	6489.6	6.4896	4056	4056	26321.8176	26321.8176	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Public Library - Interior	001	Mechanical Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$7.9	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Library - Interior	001	Mechanical Room	60W Incandescent Fixture	1	60	0.06	500	30	\$4.7	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.047	23.5	3.7	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0		
Public Library - Interior	001	Meeting Room	26W CFL Fixture	19	494	0.494	4056	2003.664	\$313.4	None Proposed	19	494	0.494	4056	4056	2003.664	2003.664	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Public Library - Interior	001	Meeting Room	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	4056	2056.392	\$321.6	None Proposed	10	507	0.507	4056	4056	2056.392	2056.392	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Library - Interior	001	Meeting Room	60W Incandescent Fixture	4	240	0.24	4056	973.44	\$152.2	Replace 60W Incandescent Fixture with 13W CFL	4	52	0.052	4056	4056	210.912	210.912	None Proposed	0	0.188	762.528	119.3	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$80.0	\$20.0	\$100.0		
Public Library - Interior	001	Mens Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.0	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Public Library - Interior	001	Mens Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.0	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Library - Interior	001	Offices	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	352	0.352	4056	1427.712	\$223.3	None Proposed	4	352	0.352	4056	4056	1427.712	1427.712	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Library - Interior	001	Stairwells	13W CFL Fixture	4	52	0.052	4056	210.912	\$33.0	None Proposed	4	52	0.052	4056	4056	210.912	210.912	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Library - Interior	001	Womens Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.0	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Library - Interior	001	Womens Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.0	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - Animal Control - Exterior	000	Exterior	150W High Pressure Sodium Wall Pack	1	189	0.189	1	0.189	\$0.0	Replace 150W Fixture with Induction Light Fixture	1	90	0.09	1	1	0.09	0.09	None Proposed	0	0.099	0.099	0.0	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$137.0	\$380.0	\$517.0		
Public Works - Animal Control - Interior	001	Bathroom	2' 17W Fluorescent Fixture	1	15	0.015	500	7.5	\$1.4	None Proposed	1	15	0.015	500	500	7.5	7.5	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - Animal Control - Interior	001	Cage Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$18.3	None Proposed	4	202.8	0.2028	500	500	101.4	101.4	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - Animal Control - Interior	001	Cage Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$18.3	None Proposed	4	202.8	0.2028	500	500	101.4	101.4	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - Animal Control - Interior	001	Cage Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$18.3	None Proposed	4	202.8	0.2028	500	500	101.4	101.4	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - Animal Control - Interior	001	Hallway	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	500	152.1	\$27.4	None Proposed	6	304.2	0.3042	500	500	152.1	152.1	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - Animal Control - Interior	001	Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	500	126.75	\$22.8	None Proposed	5	253.5	0.2535	500	500	126.75	126.75	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - Animal Control - Interior	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.6	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.4	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5		
Public Works - City Yard - Exterior	000	Exterior	250W MH Fixture	16	4560	4.56	4380	19972.8	\$3,926.7	Replace 250W Fixture with Induction Light Fixture	16	1760	1.76	4380	4380	7708.8	7708.8	None Proposed	0	2.8	12264	2,411.1	\$0.0	\$390.0	\$137.0	\$0.0	\$0.0	\$137.0	\$390.0	\$527.0	\$2,192.0	\$6,240.0	\$8,432.0		
Public Works - City Yard - Exterior	000	Exterior	Exterior Wall Packs (Assume 70w)	1	90	0.09	4380	394.2	\$77.5	Replace 70W Fixture with Induction Light Fixture	1	44	0.044	4380	4380	192.72	192.72	None Proposed	0	0.046	201.48	36.6	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$137.0	\$380.0	\$517.0		
Public Works - City Yard - Interior	001	Carpenters Shop	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	12	304.8	0.3048	3120	950.976	\$187.0	None Proposed	12	304.8	0.3048	3120	3120	950.976	950.976	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Public Works - City Yard - Interior	001	Chain Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	3120	632.736	\$124.4	None Proposed	4	202.8	0.2028	3120	3120	632.736	632.736	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - City Yard - Interior	001	Conference Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$62.2	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - City Yard - Interior	001	Executive Washroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	3120	158.184	\$31.1	None Proposed	1																								

		Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Public Works - City Yard - Interior	001	Streets Division	2x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	3120	316.368	\$62.2	None Proposed	2	101.4	0.1014	3120	3120	316.368	316.368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Public Works - Community - Interior	001	Storage	1x4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	3	76.2	0.0762	500	38.1	\$7.3	None Proposed	3	76.2	0.0762	500	350	38.1	26.67	Ceiling Mounted Occupancy Sensor	1	0	11.43	2.2	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Public Works - Community - Interior	001	Storage	60W Incandescent Fixture	1	60	0.06	500	30	\$5.7	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0.047	25.45	4.9	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$93.5	\$108.0	\$201.5
Public Works - Hill Street - Exterior	001	Exterior	Double Headed 90W Halogen Fixture	1	180	0.18	4380	788.4	\$897.8	Replace 180W Fixture with Induction Light Fixture	1	90	0.09	4380	4380	394.2	394.2	None Proposed	0	0.09	394.2	448.9	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$137.0	\$380.0	\$517.0
Public Works - Hill Street - Interior	001	Basement	30W Incandescent Fixture	1	30	0.03	500	15	\$17.1	Replace 30W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.017	8.5	9.7	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Public Works - Hill Street - Interior	001	Basement	8" T12 Fixture w/ 2-T12 Lamps	7	1589	1.589	500	794.5	\$904.8	Replace 8" T12 Fixture with 1 Tandem Double-Length 2-T8 Lamp Fixture	7	840	0.84	500	500	420	420	None Proposed	0	0.749	374.5	426.5	\$65.1	\$105.0	\$93.0	\$0.0	\$0.0	\$93.0	\$170.1	\$263.1	\$651.0	\$1,190.7	\$1,841.7
Public Works - Hill Street - Interior	001	Bathroom	60W Incandescent Fixture	1	60	0.06	500	30	\$34.2	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.047	23.5	26.8	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Public Works - Hill Street - Interior	001	Bathroom	1x4 Fixtures w/ 1-T12 Lamp Fixture w/ Magnetic Ballast	1	42.8	0.0428	500	21.4	\$24.4	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	24.32	0.02432	500	500	12.16	12.16	None Proposed	0	0.01848	9.24	10.5	\$35.0	\$5.0	\$65.0	\$0.0	\$0.0	\$65.0	\$40.0	\$105.0	\$65.0	\$40.0	\$105.0
Public Works - Hill Street - Interior	001	Bathroom	2x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	171.2	0.1712	500	85.6	\$97.5	Replace T12 Bulbs With High Perf. T8 Bulbs. Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	2	97.2	0.0972	500	500	48.6	48.6	None Proposed	0	0.074	37	42.1	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$130.0	\$160.0	\$29.0
Public Works - Hill Street - Interior	001	Closet	150W Incandescent Fixture	2	300	0.3	500	150	\$170.8	Replace 150W Incandescent Fixture with 25W CFL	2	50	0.05	500	350	25	17.5	Ceiling Mounted Occupancy Sensor	1	0.25	132.5	150.9	\$0.0	\$7.0	\$20.0	\$103.0	\$73.5	\$20.0	\$7.0	\$27.0	\$113.5	\$117.0	\$230.5
Public Works - Hill Street - Interior	001	Entrerance Way	2x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$57.7	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - Hill Street - Interior	001	Storage Room	2x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	13	659.1	0.6591	500	329.55	\$375.3	None Proposed	13	659.1	0.6591	500	350	329.55	230.685	Ceiling Mounted Occupancy Sensor	1	0	98.865	112.6	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Public Works - Hill Street - Interior	001	Storage Room	2x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$28.9	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	8.7	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Senior Center - Exterior	000	Exterior	60W Incandescent Fixture	2	120	0.12	4380	525.6	\$101.9	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	4380	4380	113.88	113.88	None Proposed	0	0.094	411.72	79.8	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$40.0	\$10.0	\$50.0
Senior Center - Exterior	000	Exterior	Exterior Wall Packs (Assume 70w)	10	900	0.9	4380	3942	\$764.4	Replace 70W Fixture with Induction Light Fixture	10	440	0.44	4380	4380	1927.2	1827.2	None Proposed	0	0.46	2014.8	390.7	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$1,370.0	\$3,800.0	\$5,170.0
Senior Center - Exterior	000	Exterior	Exterior Wall Packs (Assume 70w)	16	1440	1.44	4380	6307.2	\$1,223.0	Replace 70W Fixture with Induction Light Fixture	16	704	0.704	4380	4380	3083.52	3083.52	None Proposed	0	0.736	3223.68	625.1	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$2,192.0	\$6,080.0	\$8,272.0
Senior Center - Interior	001	14	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	1344	1.344	4368	5870.592	\$1,138.3	None Proposed	12	1344	1.344	4368	4368	5870.592	5870.592	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	15	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	1344	1.344	4368	5870.592	\$1,138.3	None Proposed	12	1344	1.344	4368	4368	5870.592	5870.592	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	16	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	4368	2935.296	\$569.2	None Proposed	6	672	0.672	4368	4368	2935.296	2935.296	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	17	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	1344	1.344	4368	5870.592	\$1,138.3	None Proposed	12	1344	1.344	4368	4368	5870.592	5870.592	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	18	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	4368	978.432	\$189.7	None Proposed	2	224	0.224	4368	4368	978.432	978.432	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	18	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	4368	2935.296	\$569.2	None Proposed	6	672	0.672	4368	4368	2935.296	2935.296	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	18	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	112	0.112	4368	489.216	\$94.9	None Proposed	1	112	0.112	4368	4368	489.216	489.216	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	18	60W Incandescent Fixture	1	60	0.06	4368	262.08	\$50.8	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	4368	4368	56.784	56.784	None Proposed	0	0.047	205.296	39.8	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Senior Center - Interior	001	19	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	1344	1.344	4368	5870.592	\$1,138.3	None Proposed	12	1344	1.344	4368	4368	5870.592	5870.592	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	20	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	1344	1.344	4368	5870.592	\$1,138.3	None Proposed	12	1344	1.344	4368	4368	5870.592	5870.592	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	21	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	1344	1.344	4368	5870.592	\$1,138.3	None Proposed	12	1344	1.344	4368	4368	5870.592	5870.592	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	22	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	1344	1.344	4368	5870.592	\$1,138.3	None Proposed	12	1344	1.344	4368	4368	5870.592	5870.592	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	23	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	1344	1.344	4368	5870.592	\$1,138.3	None Proposed	12	1344	1.344	4368	4368	5870.592	5870.592	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	24	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	336	0.336	4368	1467.648	\$284.6	None Proposed	3	336	0.336	4368	4368	1467.648	1467.648	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	24	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	4368	2935.296	\$569.2	None Proposed	6	672	0.672	4368	4368	2935.296	2935.296	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	100	2x4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	18	1584	1.584	4368	6918.912	\$1,341.6	None Proposed	18	1584	1.584	4368	4368	6918.912	6918.912	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	102	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	15	760.5	0.7605	4368	3321.864	\$644.1	None Proposed	15	760.5	0.7605	4368	4368	3321.864	3321.864	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	104	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	14	709.8	0.7098	4368	3100.4064	\$601.2	None Proposed	14	709.8	0.7098	4368	4368	3100.4064	3100.4064	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	105	2x4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	4368	2306.304	\$447.2	None Proposed	6	528	0.528	4368	4368	2306.304	2306.304	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	105	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	4368	664.3728	\$128.8	None Proposed	3	152.1	0.1521	4368	4368	664.3728	664.3728	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	106	2x4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	13	1144	1.144	4368	4996.992	\$968.9	None Proposed	13	1144	1.144	4368	4368	4996.992	4996.992	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	109	2x4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	6	528	0.528	4368	2306.304	\$447.2	None Proposed	6	528	0.528	4368	4368	2306.304	2306.304	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	Cafeteria	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	12	1344	1.344	4368	5870.592	\$1,138.3	None Proposed	12	1344	1.344	4368	4368	5870.592	5870.592	None Proposed	0	0	0	0.0											

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total	
Senior Center - Interior	001	Hallway	60W Incandescent Fixture	1	60	0.06	4368	262.08	\$50.8	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	4368	4368	56.784	56.784	None Proposed	0	0.047	205.296	39.8	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0	
Senior Center - Interior	001	Handicap Bathroom	1X4 Suspended Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$9.8	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Health Dept	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	19	963.3	0.9633	4368	4207.6944	\$815.9	None Proposed	19	963.3	0.9633	4368	4368	4207.6944	4207.6944	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Janitors Closet	13W CFL Fixture	1	13	0.013	500	6.5	\$1.3	None Proposed	1	13	0.013	500	350	6.5	4.55	Ceiling Mounted Occupancy Sensor	1	0	1.95	0.4	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
Senior Center - Interior	001	Kitchen	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	4368	1107.288	\$214.7	None Proposed	5	253.5	0.2535	4368	4368	1107.288	1107.288	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Kitchen	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	912.6	0.9126	4368	3986.2368	\$772.9	None Proposed	18	912.6	0.9126	4368	4368	3986.2368	3986.2368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Kitchen	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	4368	2214.576	\$429.4	None Proposed	10	507	0.507	4368	4368	2214.576	2214.576	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Kitchen	60W Incandescent Fixture	1	60	0.06	4368	262.08	\$50.8	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	4368	4368	56.784	56.784	None Proposed	0	0.047	205.296	39.8	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0	
Senior Center - Interior	001	Maintenance Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	4368	1771.6608	\$343.5	None Proposed	8	405.6	0.4056	4368	4368	1771.6608	1771.6608	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Mens Bathroom	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	336	0.336	500	168	\$32.6	None Proposed	3	336	0.336	500	500	168	168	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Mens Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	500	126.75	\$24.6	None Proposed	5	253.5	0.2535	500	500	126.75	126.75	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Mens Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	\$14.7	None Proposed	3	152.1	0.1521	500	500	76.05	76.05	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Mens Bathroom	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	2	50.8	0.0508	500	25.4	\$4.9	None Proposed	2	50.8	0.0508	500	500	25.4	25.4	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	4368	1956.864	\$379.4	None Proposed	4	448	0.448	4368	4368	1956.864	1956.864	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	264	0.264	4368	1153.152	\$223.6	None Proposed	3	264	0.264	4368	4368	1153.152	1153.152	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	13	1144	1.144	4368	4996.992	\$968.9	None Proposed	13	1144	1.144	4368	4368	4996.992	4996.992	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Office	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	3	264	0.264	4368	1153.152	\$223.6	None Proposed	3	264	0.264	4368	4368	1153.152	1153.152	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	4368	442.9152	\$85.9	None Proposed	2	101.4	0.1014	4368	4368	442.9152	442.9152	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Office	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	4368	2214.576	\$429.4	None Proposed	10	507	0.507	4368	4368	2214.576	2214.576	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	440	0.44	4368	1921.92	\$372.7	None Proposed	5	440	0.44	4368	4368	1921.92	1921.92	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	4368	221.4576	\$42.9	None Proposed	1	50.7	0.0507	4368	4368	221.4576	221.4576	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	Pool Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	27	1368.9	1.3689	4368	5979.3552	\$1,159.4	None Proposed	27	1368.9	1.3689	4368	4368	5979.3552	5979.3552	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Pool Room Hallway	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	4368	1771.6608	\$343.5	None Proposed	8	405.6	0.4056	4368	4368	1771.6608	1771.6608	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Restroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	4368	221.4576	\$42.9	None Proposed	1	50.7	0.0507	4368	4368	221.4576	221.4576	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	Senior Health	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	18	912.6	0.9126	4368	3986.2368	\$772.9	None Proposed	18	912.6	0.9126	4368	4368	3986.2368	3986.2368	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	Server Room	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	1	112	0.112	500	56	\$10.9	None Proposed	1	112	0.112	500	500	56	56	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	Stage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	20	1014	1.014	4368	4429.152	\$858.8	None Proposed	20	1014	1.014	4368	4368	4429.152	4429.152	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Senior Center - Interior	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$4.9	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	1.5	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
Senior Center - Interior	001	Storage	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	500	152.1	\$29.5	None Proposed	6	304.2	0.3042	500	350	152.1	106.47	Ceiling Mounted Occupancy Sensor	1	0	45.63	8.8	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
Senior Center - Interior	001	Storage	60W Incandescent Fixture	2	120	0.12	500	60	\$11.6	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	500	350	13	9.1	Ceiling Mounted Occupancy Sensor	1	0.094	50.9	9.9	\$0.0	\$5.0	\$20.0	\$103.0	\$73.5	\$20.0	\$5.0	\$25.0	\$113.5	\$113.0	\$226.5	
Senior Center - Interior	001	Womens Bathroom	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	3	336	0.336	500	168	\$32.6	None Proposed	3	336	0.336	500	500	168	168	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Womens Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$19.7	None Proposed	4	202.8	0.2028	500	500	101.4	101.4	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Womens Bathroom	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	\$14.7	None Proposed	3	152.1	0.1521	500	500	76.05	76.05	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Senior Center - Interior	001	Womens Bathroom	1X4 Fixtures w/ 1-T8 Lamps w/ Electronic Ballasts	2	50.8	0.0508	500	25.4	\$4.9	None Proposed	2	50.8	0.0508	500	500	25.4	25.4	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Youth Services - Main Building - Exterior	000	Exterior	Exterior Wall Packs (Assume 70w)	3	270	0.27	4380	1182.6	\$362.0	Replace 70W Fixture with Induction Light Fixture	3	132	0.132	4380	4380	578.16	578.16	None Proposed	0	0.138	604.44	185.0	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$411.0	\$1,140.0	\$1,551.0	
Youth Services - Main Building - Interior	000	Basement	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	11	557.7	0.5577	2340	1305.018	\$399.5	None Proposed	11	557.7	0.5577	2340	2340	1305.018	1305.018	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Youth Services - Main Building - Interior	000	Basement	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	2340	355.914	\$108.9	None Proposed	3	152.1	0.1521	2340	2340	355.914	355.914	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Youth Services - Main Building - Interior	000	Boiler Room	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$15.5	None Proposed	2	101.4	0.1014	500	350	50.7	35.49	Ceiling Mounted Occupancy Sensor	1	0	15.21	4.7	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
Youth Services - Main Building - Interior	000	Storage	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$7.8	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	2.3	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5	
Youth Services - Main Building - Interior	001	Bathroom	60W Incandescent Fixture	1	60	0.06	500	30	\$9.2	Replace																								

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Youth Services - Main Building - Interior	001	Storage	2x2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$15.5	None Proposed	2	101.4	0.1014	500	350	50.7	35.49	Ceiling Mounted Occupancy Sensor	1	0	15.21	4.7	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Youth Services - Main Building - Interior	002	Bathroom	60W Incandescent Fixture	1	60	0.06	500	30	\$9.2	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.047	23.5	7.2	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Youth Services - Main Building - Interior	002	Breakroom	2x2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	2340	237.276	\$72.6	None Proposed	2	101.4	0.1014	2340	2340	237.276	237.276	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Youth Services - Main Building - Interior	002	Hallway	2x2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	2340	593.19	\$181.6	None Proposed	5	253.5	0.2535	2340	2340	593.19	593.19	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Youth Services - Main Building - Interior	002	Offices	2x2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	10	507	0.507	2340	1186.38	\$363.2	None Proposed	10	507	0.507	2340	2340	1186.38	1186.38	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Youth Services - Main Building - Interior	002	Offices	2x2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	2340	474.552	\$145.3	None Proposed	4	202.8	0.2028	2340	2340	474.552	474.552	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Youth Services - Main Building - Interior	002	Offices	2x2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	2340	949.104	\$290.5	None Proposed	8	405.6	0.4056	2340	2340	949.104	949.104	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Youth Services - Main Building - Interior	002	Server Room	2x2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$7.8	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Youth Services - Main Building - Interior	002	Stairwells	2x2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	2340	237.276	\$72.6	None Proposed	2	101.4	0.1014	2340	2340	237.276	237.276	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Youth Services - Main Building - Interior	002	Storage Closet	2x2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$7.8	None Proposed	1	50.7	0.0507	500	350	25.35	17.745	Ceiling Mounted Occupancy Sensor	1	0	7.605	2.3	\$0.0	\$0.0	\$0.0	\$103.0	\$73.5	\$0.0	\$0.0	\$0.0	\$73.5	\$103.0	\$176.5
Youth Services - Main Building - Interior	002	Team Room	2x2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	2340	711.828	\$217.9	None Proposed	6	304.2	0.3042	2340	2340	711.828	711.828	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	
Youth Services - Main Building - Interior	003	Attic	60W Incandescent Fixture	2	120	0.12	2340	280.8	\$86.0	Replace 60W Incandescent Fixture with 13W CFL	2	26	0.026	2340	2340	60.84	60.84	None Proposed	0	0.094	219.96	67.3	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$40.0	\$10.0	\$50.0

Appendix G - Lighting Upgrades

Bldg	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed W/ht Without Sensors	Proposed W/ht With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Public Works - Transfer Station Scale House - Interior	001	Scale House	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	2392	242.5488	\$47.7	None Proposed	2	101.4	0.1014	2392	2392	242.5488	242.5488	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - Transfer Station Hut - Interior	001	Hut	400W Metal Halide Fixtures	6	2748	2.748	2392	6573.216	\$2,874.5	Replace Metal Halide Fixtures with 6-Lamp Fluorescent Highway Fixtures	6	1356	1.356	2392	2392	3243.552	3243.552	None Proposed	0	1.392	3329.664	1,456.1	\$168.0	\$105.0	\$100.0	\$0.0	\$0.0	\$100.0	\$273.0	\$373.0	\$600.0	\$1,638.0	\$2,238.0
Public Works - Transfer Station Hut - Exterior	001	Exterior	Flood Lights (Assume 400W MH)	1	458	0.458	4380	2006.04	\$877.2	Replace 400W Fixture with Induction Light Fixture	1	215	0.215	4380	4380	941.7	941.7	None Proposed	0	0.243	1064.34	465.4	\$0.0	\$485.0	\$137.0	\$0.0	\$0.0	\$137.0	\$485.0	\$622.0	\$137.0	\$485.0	\$622.0
Public Works - Transfer Station Hut - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	1	90	0.09	4380	394.2	\$172.4	Replace 70W Fixture with Induction Light Fixture	1	44	0.044	4380	4380	192.72	192.72	None Proposed	0	0.046	201.48	88.1	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$137.0	\$380.0	\$517.0
Public Works - Transfer Station Scale House - Interior	001	Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	2392	1071.616	\$210.7	None Proposed	4	448	0.448	2392	2392	1071.616	1071.616	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - Transfer Station Scale House - Interior	001	Office	2X2 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	2392	121.2744	\$23.8	None Proposed	1	50.7	0.0507	2392	2392	121.2744	121.2744	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - Transfer Station Scale House - Interior	001	Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	2392	535.808	\$105.3	None Proposed	2	224	0.224	2392	2392	535.808	535.808	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Public Works - Transfer Station Scale House - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	2	180	0.18	4380	788.4	\$155.0	Replace 70W Fixture with Induction Light Fixture	2	88	0.088	4380	4380	385.44	385.44	None Proposed	0	0.092	402.96	79.2	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$274.0	\$760.0	\$1,034.0
Public Works - Transfer Station Scale House - Exterior	001	Exterior	150W High Pressure Sodium Wall Pack	1	189	0.189	4380	827.82	\$162.7	Replace 150W Fixture with Induction Light Fixture	1	90	0.09	4380	4380	394.2	394.2	None Proposed	0	0.099	433.62	85.2	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$137.0	\$380.0	\$517.0
Water Pollution Control - Admin - Interior	001	Lobby	150W Incandescent Fixture	4	600	0.6	2340	1404	\$216.2	Replace 150W Incandescent Fixture with 25W CFL	4	100	0.1	2340	2340	234	234	None Proposed	0	0.5	1170	180.2	\$0.0	\$7.0	\$20.0	\$0.0	\$0.0	\$20.0	\$7.0	\$27.0	\$88.0	\$28.0	\$108.0
Water Pollution Control - Admin - Interior	001	Conference Room	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	2340	1048.32	\$161.4	None Proposed	4	448	0.448	2340	2340	1048.32	1048.32	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Admin - Interior	001	Server Room	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	2	224	0.224	2340	524.16	\$80.7	None Proposed	2	224	0.224	2340	2340	524.16	524.16	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Admin - Interior	001	Lobby	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	2340	474.552	\$73.1	None Proposed	4	202.8	0.2028	2340	2340	474.552	474.552	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Admin - Interior	001	Mens Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$3.9	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Admin - Interior	001	Womens Bathroom	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$3.9	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Admin - Interior	001	Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	2340	1048.32	\$161.4	None Proposed	4	448	0.448	2340	2340	1048.32	1048.32	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Admin - Interior	001	Office	2X4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	4	448	0.448	2340	1048.32	\$161.4	None Proposed	4	448	0.448	2340	2340	1048.32	1048.32	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Operations - Interior	001	Electrical Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	500	152.1	\$23.4	None Proposed	6	304.2	0.3042	500	500	152.1	152.1	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Operations - Interior	001	Office	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	2340	949.104	\$146.2	None Proposed	8	405.6	0.4056	2340	2340	949.104	949.104	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Operations - Interior	001	Hallway	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	2340	474.552	\$73.1	None Proposed	4	202.8	0.2028	2340	2340	474.552	474.552	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Operations - Interior	001	Lab	2X4 Fixtures w/ 3-T8 Lamps w/ Electronic Ballasts	9	792	0.792	2340	1853.28	\$285.4	None Proposed	9	792	0.792	2340	2340	1853.28	1853.28	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Operations - Interior	001	Closet	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	1	50.7	0.0507	500	25.35	\$3.9	None Proposed	1	50.7	0.0507	500	500	25.35	25.35	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Operations - Interior	001	Break Room	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	2340	474.552	\$73.1	None Proposed	4	202.8	0.2028	2340	2340	474.552	474.552	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Operations - Interior	001	Locker Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	2340	593.19	\$91.4	None Proposed	5	253.5	0.2535	2340	2340	593.19	593.19	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Operations - Interior	001	Janitors Closet	60W Incandescent Fixture	1	60	0.06	500	30	\$4.6	Replace 60W Incandescent Fixture with 13W CFL	1	13	0.013	500	500	6.5	6.5	None Proposed	0	0.047	23.5	3.6	\$0.0	\$5.0	\$20.0	\$0.0	\$0.0	\$20.0	\$5.0	\$25.0	\$20.0	\$5.0	\$25.0
Water Pollution Control - Operations - Interior	000	Locker Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	2340	474.552	\$73.1	None Proposed	4	202.8	0.2028	2340	2340	474.552	474.552	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Operations - Interior	008	UV Room	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	19	963.3	0.9633	2340	2254.122	\$347.1	None Proposed	19	963.3	0.9633	2340	2340	2254.122	2254.122	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Headworks - Interior	001	Grit Room	400W MH Fixture	6	2748	2.748	2340	6430.32	\$990.3	None Proposed	6	2748	2.748	2340	2340	6430.32	6430.32	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Headworks - Interior	000	Basement	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	8	405.6	0.4056	2340	949.104	\$146.2	None Proposed	8	405.6	0.4056	2340	2340	949.104	949.104	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Headworks - Interior	001	Stairwell	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	2340	237.276	\$36.5	None Proposed	2	101.4	0.1014	2340	2340	237.276	237.276	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Headworks - Interior	000	Exterior	Exterior Wall Packs (Assume 70w)	2	180	0.18	4380	788.4	\$121.4	Replace 70W Fixture with Induction Light Fixture	2	88	0.088	4380	4380	385.44	385.44	None Proposed	0	0.092	402.96	62.1	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$274.0	\$760.0	\$1,034.0
Water Pollution Control - Primary - Interior	001	Primary	400W MH Fixture	2	916	0.916	500	458	\$70.5	None Proposed	2	916	0.916	500	500	458	458	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Secondary Interior	001	Secondary	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	5	253.5	0.2535	500	126.75	\$19.5	None Proposed	5	253.5	0.2535	500	500	126.75	126.75	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Secondary Interior	001	Secondary	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	6	304.2	0.3042	500	152.1	\$23.4	None Proposed	6	304.2	0.3042	500	500	152.1	152.1	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Air Blower Interior	001	Blower Building	2X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$15.6	None Proposed	4	202.8	0.2028	500	500	101.4	101.4	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Air Blower Interior	001	Blower Building	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	4	202.8	0.2028	500	101.4	\$15.6	None Proposed	4	202.8	0.2028	500	500	101.4	101.4	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Air Blower Exterior	000	Exterior	Exterior Wall Packs (Assume 70w)	3	270	0.27	4380	1182.6	\$182.1	Replace 70W Fixture with Induction Light Fixture	3	132	0.132	4380	4380	578.16	578.16	None Proposed	0	0.138	604.44	93.1	\$0.0	\$380.0	\$137.0	\$0.0	\$0.0	\$137.0	\$380.0	\$517.0	\$411.0	\$1,140.0	\$1,551.0
Water Pollution Control - Pump House - Interior	001	Pump House	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$7.8	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Pump House - Interior	001	Pump House	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2	101.4	0.1014	500	50.7	\$7.8	None Proposed	2	101.4	0.1014	500	500	50.7	50.7	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Pump House - Interior	001	Pump House	1X4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	2																													

Appendix G - Lighting Upgrades

Building	Floor	Location/Room #	Existing Fixture/Lamp & Ballast Description	Qty of Existing Fixtures	Existing Fixture Watts	Existing kW	Operating Hours	Existing kWh	Existing Annual Energy Cost	Proposed Replacement Solution	Qty of Proposed Fixtures	Proposed Fixture Watts	Proposed kW Base	Proposed Operational Hours Without Sensors	Proposed Operational Hours With Sensors	Proposed kWh Without Sensors	Proposed kWh With Sensors	Proposed Occupancy Sensor Type	Occupancy Sensor Quantity	Total kW Saved	Total kWh Saved	Energy Cost Savings	Ballast/Fixture/Reflector Per Unit Price	Bulb (Per Unit Price)	Labor (Per Unit Price)	Occupancy Sensor (Per Unit Price)	Occupancy Sensor (Per Unit Labor Price)	Labor Subtotal	Materials Subtotal	Labor & Materials Subtotal	Labor Total	Materials Total	Labor & Materials Total
Water Pollution Control - Sludge Disposal - Interior	001	Garage	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	14	1568	1.568	500	784	\$120.7	None Proposed	14	1568	1.568	500	500	784	784	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Sludge Disposal - Interior	001	Garage	2x4 Fixtures w/ 4-T8 Lamps w/ Electronic Ballasts	6	672	0.672	500	336	\$51.7	None Proposed	6	672	0.672	500	500	336	336	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Sludge Disposal - Interior	001	Garage	1x4 Fixtures w/ 2-T8 Lamps w/ Electronic Ballasts	3	152.1	0.1521	500	76.05	\$11.7	None Proposed	3	152.1	0.1521	500	500	76.05	76.05	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Broad Street PS - Interior	001	Pump Station	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	171.2	0.1712	48	8.2176	\$1.4	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	2	97.2	0.0972	48	48	4.6656	4.6656	None Proposed	0	0.074	3.552	0.6	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$130.0	\$160.0	\$290.0
Water Pollution Control - Broad Street PS - Exterior	000	Exterior	60W Incandescent Fixture	2	120	0.12	0	0	\$0.0	None Proposed	2	120	0.12	0	0	0	0	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Cherry Hill PS - Interior	001	Pump Station	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	2	171.2	0.1712	48	8.2176	\$1.8	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	2	97.2	0.0972	48	48	4.6656	4.6656	None Proposed	0	0.074	3.552	0.8	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$130.0	\$160.0	\$290.0
Water Pollution Control - Cherry Hill PS - Exterior	001	Exterior	60W Incandescent Fixture	2	120	0.12	0	0	\$0.0	None Proposed	2	120	0.12	0	0	0	0	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Cross PS - Interior	001	Pump Station	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	4	342.4	0.3424	48	16.4352	\$3.0	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	4	194.4	0.1944	48	48	9.3312	9.3312	None Proposed	0	0.148	7.104	1.3	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$260.0	\$320.0	\$580.0
Water Pollution Control - Cross PS - Exterior	001	Exterior	Exterior Wall Packs (Assume 70w)	2	180	0.18	0	0	\$0.0	None Proposed	2	180	0.18	0	0	0	0	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Dryley PS - Interior	001	Pump Station	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	4	342.4	0.3424	48	16.4352	\$20.9	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	4	194.4	0.1944	48	48	9.3312	9.3312	None Proposed	0	0.148	7.104	9.0	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$260.0	\$320.0	\$580.0
Water Pollution Control - Dryley PS - Exterior	001	Exterior	60W Incandescent Fixture	2	120	0.12	0	0	\$0.0	None Proposed	2	120	0.12	0	0	0	0	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - East Main PS - Interior	001	Pump Station	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.0856	48	4.1088	\$0.8	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	48.6	0.0486	48	48	2.3328	2.3328	None Proposed	0	0.037	1.776	0.3	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0
Water Pollution Control - East Main PS - Exterior	001	Exterior	60W Incandescent Fixture	1	60	0.06	0	0	\$0.0	None Proposed	1	60	0.06	0	0	0	0	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Ivy PS - Interior	001	Pump Station	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.0856	48	4.1088	\$0.7	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	48.6	0.0486	48	48	2.3328	2.3328	None Proposed	0	0.037	1.776	0.3	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0
Water Pollution Control - Ivy PS - Exterior	001	Exterior	60W Incandescent Fixture	2	120	0.12	0	0	\$0.0	None Proposed	2	120	0.12	0	0	0	0	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Julia PS - Interior	001	Pump Station	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.0856	48	4.1088	\$0.7	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	48.6	0.0486	48	48	2.3328	2.3328	None Proposed	0	0.037	1.776	0.3	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0
Water Pollution Control - Julia PS - Exterior	001	Exterior	60W Incandescent Fixture	2	120	0.12	0	0	\$0.0	None Proposed	2	120	0.12	0	0	0	0	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Lake PS - Interior	001	Pump Station	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.0856	48	4.1088	\$1.0	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	48.6	0.0486	48	48	2.3328	2.3328	None Proposed	0	0.037	1.776	0.5	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0
Water Pollution Control - Lake PS - Exterior	001	Exterior	60W Incandescent Fixture	2	120	0.12	0	0	\$0.0	None Proposed	2	120	0.12	0	0	0	0	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Water Pollution Control - Luken PS - Interior	001	Pump Station	1x4 Fixtures w/ 2-T12 Lamp Fixture w/ Magnetic Ballast	1	85.6	0.0856	48	4.1088	\$1.6	Replace T12 Bulbs With High Perf. T8 Bulbs, Replace Ballast w/ High Perf. 0.78 Ballast Factor Ballast	1	48.6	0.0486	48	48	2.3328	2.3328	None Proposed	0	0.037	1.776	0.7	\$70.0	\$10.0	\$65.0	\$0.0	\$0.0	\$65.0	\$80.0	\$145.0	\$65.0	\$80.0	\$145.0
Water Pollution Control - Luken PS - Exterior	001	Exterior	60W Incandescent Fixture	1	60	0.06	0	0	\$0.0	None Proposed	1	60	0.06	0	0	0	0	None Proposed	0	0	0	0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0

Appendix G - Lighting Upgrades

[illegible]

APPENDIX H

Motor and VFD Upgrades Analysis

Appendix H

Standard Efficiency					VFD			Premium Efficiency				Premium Efficiency																
Description	Site	Department	Horsepower	Efficiency	Equipment Cost	Labor Cost	Total Cost	Equipment Cost	Efficiency	Labor Cost	Total Cost	Total (VFD+PE Motor)	Markup ³	Inflated Total (VFD+PE Motor)	Cost Difference	Yearly Runtime	kW Usage Prior to Upgrades	kWh/Yr Prior to Upgrades	Energy Cost Prior to Upgrades	kW Usage with VFD & Motor Upgrades	kWh/Yr After Upgrades	Annual Energy Cost After Upgrades	Energy Savings	Incentive	Simple Payback (Years)			
Blower #1 ^{2,5}	Water Pollution Control Plant	Water Pollution Control	350	95.4				\$32,538.0	96.20	1500.00	34038.00	34038.00	14891.63	\$48,930	\$48,929.6	900	273.69	246320.8	\$37,922.6	271.41	244272.35	\$37,607.21	\$315.36	\$700.00	152.93			
Blower #2 ^{2,5}	Water Pollution Control Plant	Water Pollution Control	350	89				\$32,538.0	96.20	1500.00	34038.00	34038.00	14891.63	\$48,930	\$48,929.6	900	293.37	264033.7	\$40,649.6	271.41	244272.35	\$37,607.21	\$3,042.38	\$700.00	15.85			
Blower #3 ^{2,5}	Water Pollution Control Plant	Water Pollution Control	250	95.8				\$19,347.0	96.50	850.00	20197.00	20197.00	8836.19	\$29,033	\$29,033.2	1289	194.68	250937.9	\$38,633.4	193.26	249117.62	\$38,353.17	\$280.24	\$700.00	101.10			
Blower #4 ^{2,5}	Water Pollution Control Plant	Water Pollution Control	250	95.8				\$19,347.0	96.50	850.00	20197.00	20197.00	8836.19	\$29,033	\$29,033.2	1289	194.68	250937.9	\$38,633.4	193.26	249117.62	\$38,353.17	\$280.24	\$700.00	101.10			
Mixer Tank #1 Inside ²	Water Pollution Control Plant	Water Pollution Control	10	88				\$954.0	92.40	88.50	1042.50	1042.50	456.09	\$1,499	\$1,498.6	8760	8.48	74260.9	\$11,432.9	8.07	70724.68	\$10,888.49	\$544.42	\$100.00	2.57			
Mixer Tank #2 Outside ²	Water Pollution Control Plant	Water Pollution Control	10	88				\$954.0	92.40	88.50	1042.50	1042.50	456.09	\$1,499	\$1,498.6	8760	8.48	74260.9	\$11,432.9	8.07	70724.68	\$10,888.49	\$544.42	\$100.00	2.57			
Mixer Tank #2 Inside ²	Water Pollution Control Plant	Water Pollution Control	10	88				\$954.0	92.40	88.50	1042.50	1042.50	456.09	\$1,499	\$1,498.6	8760	8.48	74260.9	\$11,432.9	8.07	70724.68	\$10,888.49	\$544.42	\$100.00	2.57			
Mixer Tank #2 Outside ²	Water Pollution Control Plant	Water Pollution Control	10	88				\$954.0	92.40	88.50	1042.50	1042.50	456.09	\$1,499	\$1,498.6	8760	8.48	74260.9	\$11,432.9	8.07	70724.68	\$10,888.49	\$544.42	\$100.00	2.57			
Pump #1 Submersible ²	Water Pollution Control Plant	Water Pollution Control	125	94.5				\$13,313.0	95.80	505.00	13818.00	13818.00	6045.38	\$19,863	\$19,863.4	8760	98.68	864412.7	\$133,081.6	97.34	852682.67	\$131,275.67	\$1,805.91	\$600.00	10.67			
Utility Water Pump #1	Water Pollution Control Plant	Water Pollution Control	15	90.2	\$1,950	\$795	\$2,745	\$1,278.0	93.00	111.00	1389.00	1434.00	1808.63	\$5,943	\$5,942.6	3600	12.41	44660.8	\$6,875.8	9.02	32487.10	\$5,001.59	\$1,874.21	\$100.00	3.12			
Utility Water Pump #2	Water Pollution Control Plant	Water Pollution Control	15	90.2	\$1,950	\$795	\$2,745	\$1,278.0	93.00	111.00	1389.00	1434.00	1808.63	\$5,943	\$5,942.6	3600	12.41	44660.8	\$6,875.8	9.02	32487.10	\$5,001.59	\$1,874.21	\$100.00	3.12			
Utility Water Pump #3	Water Pollution Control Plant	Water Pollution Control	15	90.2	\$1,950	\$795	\$2,745	\$1,278.0	93.00	111.00	1389.00	1434.00	1808.63	\$5,943	\$5,942.6	3600	12.41	44660.8	\$6,875.8	9.02	32487.10	\$5,001.59	\$1,874.21	\$100.00	3.12			
Spray Water Pump #1	Water Pollution Control Plant	Water Pollution Control	15	90.2	\$1,950	\$795	\$2,745	\$1,278.0	93.00	111.00	1389.00	1434.00	1808.63	\$5,943	\$5,942.6	4380	12.41	54337.3	\$8,365.5	9.02	39525.97	\$6,085.26	\$2,280.29	\$100.00	2.56			
Spray Water Pump #2	Water Pollution Control Plant	Water Pollution Control	15	90.2	\$1,950	\$795	\$2,745	\$1,278.0	93.00	111.00	1389.00	1434.00	1808.63	\$5,943	\$5,942.6	4380	12.41	54337.3	\$8,365.5	9.02	39525.97	\$6,085.26	\$2,280.29	\$100.00	2.56			
WAS Blower #1 ²	Water Pollution Control Plant	Water Pollution Control	125	94.5				\$10,774.0	95.80	505.00	11279.00	11279.00	4934.56	\$16,214	\$16,213.6	8760	98.68	864412.7	\$133,081.6	97.34	852682.67	\$131,275.67	\$1,805.91	\$600.00	8.65			
WAS Blower #2 ²	Water Pollution Control Plant	Water Pollution Control	125	94.5				\$10,774.0	95.80	505.00	11279.00	11279.00	4934.56	\$16,214	\$16,213.6	8760	98.68	864412.7	\$133,081.6	97.34	852682.67	\$131,275.67	\$1,805.91	\$600.00	8.65			
Pump #1 ²	Broad Street Pump Station	Water Pollution Control	250	95.8				\$19,347.0	96.50	850.00	20197.00	20197.00	8836.19	\$29,033	\$29,033.2	2004	194.68	390131.5	\$67,809.0	193.26	387301.55	\$67,317.17	\$491.88	\$700.00	57.60			
Pump #2 ²	Broad Street Pump Station	Water Pollution Control	250	95.8				\$19,347.0	96.50	850.00	20197.00	20197.00	8836.19	\$29,033	\$29,033.2	2004	194.68	390131.5	\$67,809.0	193.26	387301.55	\$67,317.17	\$491.88		59.03			
Pump #3 ²	Broad Street Pump Station	Water Pollution Control	250	95.8				\$19,347.0	96.50	850.00	20197.00	20197.00	8836.19	\$29,033	\$29,033.2	2004	194.68	390131.5	\$67,809.0	193.26	387301.55	\$67,317.17	\$491.88		59.03			
Pump #4 ²	Broad Street Pump Station	Water Pollution Control	250	95.8				\$19,347.0	96.50	850.00	20197.00	20197.00	8836.19	\$29,033	\$29,033.2	2004	194.68	390131.5	\$67,809.0	193.26	387301.55	\$67,317.17	\$491.88	\$700.00	57.60			
Pump #1	Cherry Hill Pump Station	Water Pollution Control	10	88				\$1,650	\$530	\$2,180	\$954.0	92.40	88.50	1042.50	3222.50	1409.84	\$4,632	\$4,632.3	1435	8.48	12164.9	\$2,606.0	6.06	8689.20	\$1,861.4	\$744.57		6.22
Pump #2	Cherry Hill Pump Station	Water Pollution Control	10	88				\$1,650	\$530	\$2,180	\$954.0	92.40	88.50	1042.50	3222.50	1409.84	\$4,632	\$4,632.3	1435	8.48	12164.9	\$2,606.0	6.06	8689.20	\$1,861.4	\$744.57	\$100.00	6.09
Pump #1	Cross Pump Station	Water Pollution Control	12.7	90.2				\$1,950	\$795	\$2,745	\$1,278.0	93.00	111.00	1389.00	1434.00	1808.63	\$5,943	\$5,942.6	2009.5	10.50	21106.9	\$3,902.4	7.64	15353.55	\$2,838.6	\$1,063.71	\$100.00	5.49
Pump #2	Cross Pump Station	Water Pollution Control	52	93	\$5,300	\$1,325	\$6,625	\$4,235.0	95.00	221.00	4456.00	11081.00	4847.94	\$15,929	\$15,928.9	1985.9	41.71	82835.5	\$15,315.1	30.63	60818.71	\$11,244.5	\$4,070.59		3.91			
Pump #1 ²	East Main Pump Station	Water Pollution Control	50	93				\$4,235.0	94.00	221.00	4456.00	4456.00	1949.50	\$6,406	\$6,405.5	4176	40.11	167489.0	\$31,171.6	39.68	165707.23	\$30,840.0	\$331.61	\$220.00	18.65			
Pump #2 ²	East Main Pump Station	Water Pollution Control	50	93				\$4,235.0	94.00	221.00	4456.00	4456.00	1949.50	\$6,406	\$6,405.5	4176	40.11	167489.0	\$31,171.6	39.68	165707.23	\$30,840.0	\$331.61	\$220.00	18.65			
Pump #1 ²	Julia Pump Station	Water Pollution Control	50	93				\$4,235.0	95.00	221.00	4456.00	4456.00	1949.50	\$6,406	\$6,405.5	2903	40.11	116432.2	\$20,280.3	39.26	113980.95	\$19,853.4	\$426.95	\$220.00	14.49			
Pump #2 ²	Julia Pump Station	Water Pollution Control	50	93				\$4,235.0	95.00	221.00	4456.00	4456.00	1949.50	\$6,406	\$6,405.5	2903	40.11	116432.2	\$20,280.3	39.26	113980.95	\$19,853.4	\$426.95	\$220.00	14.49			
Pump #1 ²	Lake Pump Station	Water Pollution Control	15	90.2				\$1,278.0	93.00	111.00	1389.00	1389.00	607.69	\$1,997	\$1,996.7	1456.3	12.41	18066.5	\$4,581.4	12.03	17522.58	\$4,443.5	\$137.93		14.48			
Pump #2	Lake Pump Station	Water Pollution Control	100	94.5				\$8,525	\$1,750	\$10,275	\$8,112.0	95.40	395.00	8507.00	18782.00	8217.13	\$26,999	\$26,999.1	250	78.94	19735.4	\$5,004.6	58.65	14661.95	\$3,718.0	\$1,286.56		20.99
Pump #3	Lake Pump Station	Water Pollution Control	100	94.5				\$8,525	\$1,750	\$10,275	\$8,112.0	95.40	395.00	8507.00	18782.00	8217.13	\$26,999	\$26,999.1	250	78.94	19735.4	\$5,004.6	58.65	14661.95	\$3,718.0	\$1,286.56	\$400.00	20.67
Pump #1	Matthews Pump Station	Water Pollution Control	25	92				\$2,875	\$1,050	\$3,925	\$2,497.0	94.00	142.00	2639.00	6564.00	2871.75	\$9,436	\$9,435.8	1255	20.27	25441.0	\$4,748.3	14.88	18674.80	\$3,485.4	\$1,262.84		7.47
Pump #2	Matthews Pump Station	Water Pollution Control	25	92				\$2,875	\$1,050	\$3,925	\$2,497.0	94.00	142.00	2639.00	6564.00	2871.75	\$9,436	\$9,435.8	1255	20.27	25441.0	\$4,748.3	14.88	18674.80	\$3,485.4	\$1,262.84		7.47
Pump #1 ²	Middle Pump Station	Water Pollution Control	25	92				\$2,497.0	94.00	142.00	2639.00	2639.00	1154.56	\$3,794	\$3,793.6	45.75	20.27	927.4	\$181.0	19.84	907.70	\$177.2	\$3.85		984.93			
Pump #2 ²	Middle Pump Station	Water Pollution Control	25	92				\$2,497.0	94.00	142.00	2639.00	2639.00	1154.56	\$3,794	\$3,793.6	45.75	20.27	927.4	\$181.0	19.84	907.70	\$177.2	\$3.85		984.93			
Pump #1	Minor Pump Station	Water Pollution Control	40	93				\$3,875.0	95.00	177.00	4052.00	9352.00	4091.50	\$13,444	\$13,443.5	864	32.09	27722.3	\$4,972.8	31.41	27138.69	\$4,868.1	\$104.69		128.41			
Pump #2	Minor Pump Station	Water Pollution Control	40	93				\$3,875.0	95.00	177.00	4052.00	9352.00	4091.50	\$13,444	\$13,443.5	864	32.09	27722.3	\$4,972.8	23.56	20354.02	\$3,651.1	\$1,321.71		10.17			
Pump #1	Tyler Pump Station	Water Pollution Control	25	92				\$2,875	\$1,050	\$3,925	\$2,497.0	94.00	142.00	2639.00	6564.00	2871.75	\$9,436	\$9,435.8	1752	20.27	35516.1	\$6,939.5	14.88	26070.32	\$5,093.9	\$1,845.62		5.11
Pump #2	Tyler Pump Station	Water Pollution Control	25	92				\$2,875	\$1,050	\$3,925																		

APPENDIX I

Solar PV System Financial Analysis

City Hall
Design Goal: Provide
13% of average annual electricity

Existing Conditons
Average Annual Electrical Usage (kWh) 828,117
Current Utility Price (\$/kWh) \$0.1761

Calculations
Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 93.676
Space Needed (sq-ft) 9,368
Annual Solar kWh (PV Watts) 108,355
Net System installation Cost (\$9/kWh) \$843,084
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$943,084
Materials \$660,159
Labor \$282,925
Engineer's Opinion of Probable Cost \$1,178,855

Assumptions
Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Simple Payback	
Cost	\$1,178,855
Utility Savings	\$19,085.14
RECs	\$2,709
MC	(\$2,167)
Payback	60.1

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1761	108,354.95	\$19,085.14	\$2,709	(\$2,167)	\$19,626.92	\$19,626.92
2	0.1814	107,813.18	\$19,559.41	\$2,695	(\$2,156)	\$20,098.47	\$39,725.39
3	0.1869	107,274.11	\$20,045.46	\$2,682	(\$2,145)	\$20,581.83	\$60,307.22
4	0.1925	106,737.74	\$20,543.59	\$2,668	(\$2,135)	\$21,077.28	\$81,384.49
5	0.1982	106,204.05	\$21,054.10	\$2,655	(\$2,124)	\$21,585.12	\$102,969.61
6	0.2042	105,673.03	\$21,577.29	\$2,642	(\$2,113)	\$22,105.65	\$125,075.26
7	0.2103	105,144.67	\$22,113.49	\$2,629	(\$2,103)	\$22,639.21	\$147,714.47
8	0.2166	104,618.95	\$22,663.01	\$2,615	(\$2,092)	\$23,186.10	\$170,900.57
9	0.2231	104,095.85	\$23,226.18	\$2,602	(\$2,082)	\$23,746.66	\$194,647.23
10	0.2298	103,575.37	\$23,803.35	\$2,589	(\$2,072)	\$24,321.23	\$218,968.46
11	0.2367	103,057.49	\$24,394.87	\$2,576	(\$2,061)	\$24,910.15	\$243,878.61
12	0.2438	102,542.21	\$25,001.08	\$2,564	(\$2,051)	\$25,513.79	\$269,392.40
13	0.2511	102,029.50	\$25,622.35	\$2,551	(\$2,041)	\$26,132.50	\$295,524.90
14	0.2587	101,519.35	\$26,259.07	\$2,538	(\$2,030)	\$26,766.67	\$322,291.57
15	0.2664	101,011.75	\$26,911.61	\$2,525	(\$2,020)	\$27,416.67	\$349,708.24
16	0.2744	100,506.69	\$27,580.36	\$2,513	(\$2,010)	\$28,082.89	\$377,791.13
17	0.2826	100,004.16	\$28,265.73	\$2,500	(\$2,000)	\$28,765.75	\$406,556.89
18	0.2911	99,504.14	\$28,968.14	\$2,488	(\$1,990)	\$29,465.66	\$436,022.54
19	0.2999	99,006.62	\$29,687.99	\$2,475	(\$1,980)	\$30,183.03	\$466,205.57
20	0.3089	98,511.58	\$30,425.74	\$2,463	(\$1,970)	\$30,918.30	\$497,123.87
21	0.3181	98,019.03	\$31,181.82	\$2,450	(\$1,960)	\$31,671.92	\$528,795.79
22	0.3277	97,528.93	\$31,956.69	\$2,438	(\$1,951)	\$32,444.33	\$561,240.12
23	0.3375	97,041.29	\$32,750.81	\$2,426	(\$1,941)	\$33,236.02	\$594,476.14
24	0.3476	96,556.08	\$33,564.67	\$2,414	(\$1,931)	\$34,047.45	\$628,523.59
25	0.3580	96,073.30	\$34,398.75	\$2,402	(\$1,921)	\$34,879.12	\$663,402.71

City Hall Annex
Design Goal: Provide
100% of average annual electricity

Existing Conditions
Average Annual Electrical Usage (kWh) 8,437
Current Utility Price (\$/kWh) \$0.1894

Calculations
Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 22.5
Space Needed (sq-ft) 2,250
Annual Solar kWh (PV Watts) 26,026
Net System installation Cost (\$9/kWh) \$202,500
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$302,500
Materials \$211,750
Labor \$90,750
Engineer's Opinion of Probable Cost \$378,125

Assumptions
Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Simple Payback	
Cost	\$378,125
Utility Savings	\$4,928.82
RECs	\$651
MC	\$2
Payback	67.7

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1894	26,025.73	\$4,928.82	\$651	(\$521)	\$5,058.95	\$5,058.95
2	0.1951	25,895.60	\$5,051.31	\$647	(\$518)	\$5,180.78	\$10,239.74
3	0.2009	25,766.13	\$5,176.83	\$644	(\$515)	\$5,305.66	\$15,545.40
4	0.2069	25,637.29	\$5,305.48	\$641	(\$513)	\$5,433.66	\$20,979.06
5	0.2132	25,509.11	\$5,437.32	\$638	(\$510)	\$5,564.86	\$26,543.92
6	0.2195	25,381.56	\$5,572.43	\$635	(\$508)	\$5,699.34	\$32,243.26
7	0.2261	25,254.65	\$5,710.91	\$631	(\$505)	\$5,837.18	\$38,080.45
8	0.2329	25,128.38	\$5,852.82	\$628	(\$503)	\$5,978.47	\$44,058.91
9	0.2399	25,002.74	\$5,998.27	\$625	(\$500)	\$6,123.28	\$50,182.19
10	0.2471	24,877.73	\$6,147.32	\$622	(\$498)	\$6,271.71	\$56,453.91
11	0.2545	24,753.34	\$6,300.09	\$619	(\$495)	\$6,423.85	\$62,877.76
12	0.2622	24,629.57	\$6,456.64	\$616	(\$493)	\$6,579.79	\$69,457.55
13	0.2700	24,506.42	\$6,617.09	\$613	(\$490)	\$6,739.62	\$76,197.17
14	0.2781	24,383.89	\$6,781.52	\$610	(\$488)	\$6,903.44	\$83,100.62
15	0.2865	24,261.97	\$6,950.05	\$607	(\$485)	\$7,071.36	\$90,171.97
16	0.2951	24,140.66	\$7,122.75	\$604	(\$483)	\$7,243.46	\$97,415.43
17	0.3039	24,019.96	\$7,299.75	\$600	(\$480)	\$7,419.85	\$104,835.28
18	0.3130	23,899.86	\$7,481.15	\$597	(\$478)	\$7,600.65	\$112,435.94
19	0.3224	23,780.36	\$7,667.06	\$595	(\$476)	\$7,785.96	\$120,221.90
20	0.3321	23,661.46	\$7,857.59	\$592	(\$473)	\$7,975.89	\$128,197.79
21	0.3420	23,543.15	\$8,052.85	\$589	(\$471)	\$8,170.56	\$136,368.36
22	0.3523	23,425.43	\$8,252.96	\$586	(\$469)	\$8,370.09	\$144,738.45
23	0.3629	23,308.31	\$8,458.05	\$583	(\$466)	\$8,574.59	\$153,313.03
24	0.3738	23,191.77	\$8,668.23	\$580	(\$464)	\$8,784.19	\$162,097.22
25	0.3850	23,075.81	\$8,883.64	\$577	(\$462)	\$8,999.01	\$171,096.24

Water Department Main Office & Garage

Design Goal: Provide
85% of average annual electricity

Existing Conditions

Average Annual Electrical Usage (kWh) 65,685
Current Utility Price (\$/kWh) \$0.1116

Calculations

Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 80
Space Needed (sq-ft) 8,000
Annual Solar kWh (PV Watts) 55,522
Net System installation Cost (\$9/kWh) \$720,000
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$820,000
Materials \$574,000
Labor \$246,000
Engineer's Opinion of Probable Cost \$1,025,000

Simple Payback	
Cost	\$1,025,000
Utility Savings	\$6,197.87
RECs	\$1,388
MC	(\$1,110)
Payback	158.3

Assumptions

Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1116	55,521.56	\$6,197.87	\$1,388	(\$1,110)	\$6,475.48	\$6,475.48
2	0.1150	55,243.95	\$6,351.89	\$1,381	(\$1,105)	\$6,628.11	\$13,103.59
3	0.1184	54,967.73	\$6,509.73	\$1,374	(\$1,099)	\$6,784.57	\$19,888.16
4	0.1220	54,692.90	\$6,671.50	\$1,367	(\$1,094)	\$6,944.96	\$26,833.13
5	0.1256	54,419.43	\$6,837.29	\$1,360	(\$1,088)	\$7,109.38	\$33,942.51
6	0.1294	54,147.33	\$7,007.19	\$1,354	(\$1,083)	\$7,277.93	\$41,220.44
7	0.1333	53,876.60	\$7,181.32	\$1,347	(\$1,078)	\$7,450.71	\$48,671.15
8	0.1373	53,607.21	\$7,359.78	\$1,340	(\$1,072)	\$7,627.81	\$56,298.96
9	0.1414	53,339.18	\$7,542.67	\$1,333	(\$1,067)	\$7,809.36	\$64,108.32
10	0.1457	53,072.48	\$7,730.10	\$1,327	(\$1,061)	\$7,995.47	\$72,103.79
11	0.1500	52,807.12	\$7,922.20	\$1,320	(\$1,056)	\$8,186.23	\$80,290.02
12	0.1545	52,543.08	\$8,119.06	\$1,314	(\$1,051)	\$8,381.78	\$88,671.80
13	0.1592	52,280.37	\$8,320.82	\$1,307	(\$1,046)	\$8,582.22	\$97,254.03
14	0.1639	52,018.97	\$8,527.60	\$1,300	(\$1,040)	\$8,787.69	\$106,041.72
15	0.1689	51,758.87	\$8,739.51	\$1,294	(\$1,035)	\$8,998.30	\$115,040.02
16	0.1739	51,500.08	\$8,956.68	\$1,288	(\$1,030)	\$9,214.18	\$124,254.20
17	0.1791	51,242.58	\$9,179.26	\$1,281	(\$1,025)	\$9,435.47	\$133,689.67
18	0.1845	50,986.36	\$9,407.36	\$1,275	(\$1,020)	\$9,662.29	\$143,351.96
19	0.1900	50,731.43	\$9,641.13	\$1,268	(\$1,015)	\$9,894.79	\$153,246.75
20	0.1957	50,477.78	\$9,880.72	\$1,262	(\$1,010)	\$10,133.10	\$163,379.86
21	0.2016	50,225.39	\$10,126.25	\$1,256	(\$1,005)	\$10,377.38	\$173,757.24
22	0.2077	49,974.26	\$10,377.89	\$1,249	(\$999)	\$10,627.76	\$184,385.00
23	0.2139	49,724.39	\$10,635.78	\$1,243	(\$994)	\$10,884.40	\$195,269.40
24	0.2203	49,475.77	\$10,900.08	\$1,237	(\$990)	\$11,147.46	\$206,416.85
25	0.2269	49,228.39	\$11,170.95	\$1,231	(\$985)	\$11,417.09	\$217,833.94

Water Treatment Plant

Design Goal: Provide
30% of average annual electricity

Existing Conditions

Average Annual Electrical Usage (kWh) 1,376,547
Current Utility Price (\$/kWh) \$0.1565

Calculations

Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 354.59
Space Needed (sq-ft) 35,459
Annual Solar kWh (PV Watts) 410,154
Net System installation Cost (\$9/kWh) \$3,191,310
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$3,291,310
Materials \$2,303,917
Labor \$987,393
Engineer's Opinion of Probable Cost \$4,114,138

Assumptions

Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Simple Payback	
Cost	\$4,114,138
Utility Savings	\$64,188.60
RECs	\$10,254
MC	(\$8,203)
Payback	62.1

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1565	410,153.97	\$64,188.60	\$10,254	(\$8,203)	\$66,239.37	\$66,239.37
2	0.1612	408,103.20	\$65,783.69	\$10,203	(\$8,162)	\$67,824.20	\$134,063.57
3	0.1660	406,062.68	\$67,418.41	\$10,152	(\$8,121)	\$69,448.73	\$203,512.30
4	0.1710	404,032.37	\$69,093.76	\$10,101	(\$8,081)	\$71,113.92	\$274,626.22
5	0.1761	402,012.21	\$70,810.74	\$10,050	(\$8,040)	\$72,820.80	\$347,447.02
6	0.1814	400,002.15	\$72,570.39	\$10,000	(\$8,000)	\$74,570.40	\$422,017.42
7	0.1869	398,002.14	\$74,373.76	\$9,950	(\$7,960)	\$76,363.77	\$498,381.19
8	0.1925	396,012.12	\$76,221.95	\$9,900	(\$7,920)	\$78,202.01	\$576,583.19
9	0.1982	394,032.06	\$78,116.06	\$9,851	(\$7,881)	\$80,086.22	\$656,669.42
10	0.2042	392,061.90	\$80,057.25	\$9,802	(\$7,841)	\$82,017.56	\$738,686.98
11	0.2103	390,101.59	\$82,046.67	\$9,753	(\$7,802)	\$83,997.18	\$822,684.15
12	0.2166	388,151.09	\$84,085.53	\$9,704	(\$7,763)	\$86,026.29	\$908,710.44
13	0.2231	386,210.33	\$86,175.06	\$9,655	(\$7,724)	\$88,106.11	\$996,816.55
14	0.2298	384,279.28	\$88,316.51	\$9,607	(\$7,686)	\$90,237.90	\$1,087,054.45
15	0.2367	382,357.88	\$90,511.17	\$9,559	(\$7,647)	\$92,422.96	\$1,179,477.41
16	0.2438	380,446.09	\$92,760.37	\$9,511	(\$7,609)	\$94,662.60	\$1,274,140.01
17	0.2511	378,543.86	\$95,065.47	\$9,464	(\$7,571)	\$96,958.19	\$1,371,098.20
18	0.2587	376,651.14	\$97,427.85	\$9,416	(\$7,533)	\$99,311.10	\$1,470,409.30
19	0.2664	374,767.89	\$99,848.93	\$9,369	(\$7,495)	\$101,722.77	\$1,572,132.07
20	0.2744	372,894.05	\$102,330.17	\$9,322	(\$7,458)	\$104,194.64	\$1,676,326.71
21	0.2827	371,029.58	\$104,873.08	\$9,276	(\$7,421)	\$106,728.23	\$1,783,054.94
22	0.2911	369,174.43	\$107,479.17	\$9,229	(\$7,383)	\$109,325.05	\$1,892,379.98
23	0.2999	367,328.56	\$110,150.03	\$9,183	(\$7,347)	\$111,986.67	\$2,004,366.66
24	0.3089	365,491.92	\$112,887.26	\$9,137	(\$7,310)	\$114,714.72	\$2,119,081.38
25	0.3181	363,664.46	\$115,692.51	\$9,092	(\$7,273)	\$117,510.83	\$2,236,592.21

Rockwell Park
Design Goal: Provide
46% of average annual electricity

Existing Conditions
Average Annual Electrical Usage (kWh) 24,993
Current Utility Price (\$/kWh) \$0.3108

Calculations
Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 10
Space Needed (sq-ft) 1,000
Annual Solar kWh (PV Watts) 11,567
Net System installation Cost (\$9/kWh) \$90,000
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$190,000
Materials \$133,000
Labor \$57,000
Engineer's Opinion of Probable Cost \$237,500

Assumptions
Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Simple Payback	
Cost	\$237,500
Utility Savings	\$3,595.55
RECs	\$289
MC	(\$231)
Payback	65.0

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.3108	11,566.99	\$3,595.55	\$289	(\$231)	\$3,653.39	\$3,653.39
2	0.3202	11,509.16	\$3,684.90	\$288	(\$230)	\$3,742.45	\$7,395.83
3	0.3298	11,451.61	\$3,776.47	\$286	(\$229)	\$3,833.73	\$11,229.56
4	0.3397	11,394.35	\$3,870.32	\$285	(\$228)	\$3,927.29	\$15,156.85
5	0.3499	11,337.38	\$3,966.49	\$283	(\$227)	\$4,023.18	\$19,180.03
6	0.3604	11,280.69	\$4,065.06	\$282	(\$226)	\$4,121.46	\$23,301.49
7	0.3712	11,224.29	\$4,166.08	\$281	(\$224)	\$4,222.20	\$27,523.69
8	0.3823	11,168.17	\$4,269.60	\$279	(\$223)	\$4,325.44	\$31,849.13
9	0.3938	11,112.33	\$4,375.70	\$278	(\$222)	\$4,431.26	\$36,280.40
10	0.4056	11,056.77	\$4,484.44	\$276	(\$221)	\$4,539.72	\$40,820.12
11	0.4178	11,001.48	\$4,595.88	\$275	(\$220)	\$4,650.89	\$45,471.00
12	0.4303	10,946.48	\$4,710.09	\$274	(\$219)	\$4,764.82	\$50,235.82
13	0.4432	10,891.74	\$4,827.13	\$272	(\$218)	\$4,881.59	\$55,117.41
14	0.4565	10,837.28	\$4,947.09	\$271	(\$217)	\$5,001.27	\$60,118.68
15	0.4702	10,783.10	\$5,070.02	\$270	(\$216)	\$5,123.94	\$65,242.62
16	0.4843	10,729.18	\$5,196.01	\$268	(\$215)	\$5,249.66	\$70,492.27
17	0.4988	10,675.54	\$5,325.13	\$267	(\$214)	\$5,378.51	\$75,870.78
18	0.5138	10,622.16	\$5,457.46	\$266	(\$212)	\$5,510.57	\$81,381.35
19	0.5292	10,569.05	\$5,593.08	\$264	(\$211)	\$5,645.92	\$87,027.28
20	0.5451	10,516.20	\$5,732.07	\$263	(\$210)	\$5,784.65	\$92,811.93
21	0.5614	10,463.62	\$5,874.51	\$262	(\$209)	\$5,926.83	\$98,738.75
22	0.5783	10,411.30	\$6,020.49	\$260	(\$208)	\$6,072.55	\$104,811.30
23	0.5956	10,359.25	\$6,170.10	\$259	(\$207)	\$6,221.90	\$111,033.19
24	0.6135	10,307.45	\$6,323.43	\$258	(\$206)	\$6,374.96	\$117,408.16
25	0.6319	10,255.91	\$6,480.56	\$256	(\$205)	\$6,531.84	\$123,940.00

Fire HQ

Design Goal: Provide
50% of average annual electricity

Existing Conditions

Average Annual Electrical Usage (kWh) 109,269
Current Utility Price (\$/kWh) \$0.1751

Calculations

Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 47.468
Space Needed (sq-ft) 4,747
Annual Solar kWh (PV Watts) 54,906
Net System installation Cost (\$9/kWh) \$427,212
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$527,212
Materials \$369,048
Labor \$158,164
Engineer's Opinion of Probable Cost \$659,015

Simple Payback

Cost	\$659,015
Utility Savings	\$9,611.41
RECs	\$1,373
MC	\$2
Payback	60.0

Assumptions

Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1751	54,906.20	\$9,611.41	\$1,373	(\$1,098)	\$9,885.94	\$9,885.94
2	0.1803	54,631.67	\$9,850.25	\$1,366	(\$1,093)	\$10,123.41	\$20,009.35
3	0.1857	54,358.51	\$10,095.03	\$1,359	(\$1,087)	\$10,366.83	\$30,376.18
4	0.1913	54,086.72	\$10,345.89	\$1,352	(\$1,082)	\$10,616.33	\$40,992.51
5	0.1970	53,816.28	\$10,602.99	\$1,345	(\$1,076)	\$10,872.07	\$51,864.58
6	0.2029	53,547.20	\$10,866.47	\$1,339	(\$1,071)	\$11,134.21	\$62,998.79
7	0.2090	53,279.46	\$11,136.51	\$1,332	(\$1,066)	\$11,402.90	\$74,401.69
8	0.2153	53,013.07	\$11,413.25	\$1,325	(\$1,060)	\$11,678.31	\$86,080.00
9	0.2217	52,748.00	\$11,696.87	\$1,319	(\$1,055)	\$11,960.61	\$98,040.61
10	0.2284	52,484.26	\$11,987.53	\$1,312	(\$1,050)	\$12,249.96	\$110,290.57
11	0.2353	52,221.84	\$12,285.42	\$1,306	(\$1,044)	\$12,546.53	\$122,837.10
12	0.2423	51,960.73	\$12,590.72	\$1,299	(\$1,039)	\$12,850.52	\$135,687.62
13	0.2496	51,700.93	\$12,903.60	\$1,293	(\$1,034)	\$13,162.10	\$148,849.72
14	0.2571	51,442.42	\$13,224.25	\$1,286	(\$1,029)	\$13,481.46	\$162,331.19
15	0.2648	51,185.21	\$13,552.87	\$1,280	(\$1,024)	\$13,808.80	\$176,139.99
16	0.2727	50,929.28	\$13,889.66	\$1,273	(\$1,019)	\$14,144.31	\$190,284.30
17	0.2809	50,674.64	\$14,234.82	\$1,267	(\$1,013)	\$14,488.19	\$204,772.49
18	0.2893	50,421.27	\$14,588.56	\$1,261	(\$1,008)	\$14,840.66	\$219,613.15
19	0.2980	50,169.16	\$14,951.08	\$1,254	(\$1,003)	\$15,201.93	\$234,815.08
20	0.3070	49,918.31	\$15,322.62	\$1,248	(\$998)	\$15,572.21	\$250,387.29
21	0.3162	49,668.72	\$15,703.38	\$1,242	(\$993)	\$15,951.73	\$266,339.01
22	0.3256	49,420.38	\$16,093.61	\$1,236	(\$988)	\$16,340.71	\$282,679.73
23	0.3354	49,173.28	\$16,493.54	\$1,229	(\$983)	\$16,739.40	\$299,419.13
24	0.3455	48,927.41	\$16,903.40	\$1,223	(\$979)	\$17,148.04	\$316,567.17
25	0.3558	48,682.77	\$17,323.45	\$1,217	(\$974)	\$17,566.87	\$334,134.04

Engine 2
Design Goal: Provide
67% of average annual electricity

Existing Conditons
Average Annual Electrical Usage (kWh) 39,734
Current Utility Price (\$/kWh) \$0.1905

Calculations
Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 22.956
Space Needed (sq-ft) 2,296
Annual Solar kWh (PV Watts) 26,553
Net System installation Cost (\$9/kWh) \$206,604
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$306,604
Materials \$214,623
Labor \$91,981
Engineer's Opinion of Probable Cost \$383,255

Assumptions
Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Simple Payback	
Cost	\$383,255
Utility Savings	\$5,057.17
RECs	\$664
MC	(\$531)
Payback	73.8

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1905	26,553.19	\$5,057.17	\$664	(\$531)	\$5,189.93	\$5,189.93
2	0.1962	26,420.42	\$5,182.84	\$661	(\$528)	\$5,314.94	\$10,504.87
3	0.2021	26,288.32	\$5,311.63	\$657	(\$526)	\$5,443.07	\$15,947.94
4	0.2081	26,156.88	\$5,443.62	\$654	(\$523)	\$5,574.41	\$21,522.35
5	0.2144	26,026.09	\$5,578.90	\$651	(\$521)	\$5,709.03	\$27,231.38
6	0.2208	25,895.96	\$5,717.53	\$647	(\$518)	\$5,847.01	\$33,078.39
7	0.2274	25,766.48	\$5,859.61	\$644	(\$515)	\$5,988.45	\$39,066.84
8	0.2342	25,637.65	\$6,005.23	\$641	(\$513)	\$6,133.41	\$45,200.25
9	0.2413	25,509.46	\$6,154.46	\$638	(\$510)	\$6,282.00	\$51,482.25
10	0.2485	25,381.91	\$6,307.39	\$635	(\$508)	\$6,434.30	\$57,916.55
11	0.2560	25,255.00	\$6,464.13	\$631	(\$505)	\$6,590.41	\$64,506.96
12	0.2636	25,128.73	\$6,624.77	\$628	(\$503)	\$6,750.41	\$71,257.37
13	0.2715	25,003.09	\$6,789.39	\$625	(\$500)	\$6,914.41	\$78,171.78
14	0.2797	24,878.07	\$6,958.11	\$622	(\$498)	\$7,082.50	\$85,254.27
15	0.2881	24,753.68	\$7,131.02	\$619	(\$495)	\$7,254.78	\$92,509.06
16	0.2967	24,629.91	\$7,308.22	\$616	(\$493)	\$7,431.37	\$99,940.43
17	0.3056	24,506.76	\$7,489.83	\$613	(\$490)	\$7,612.37	\$107,552.80
18	0.3148	24,384.23	\$7,675.95	\$610	(\$488)	\$7,797.87	\$115,350.67
19	0.3242	24,262.31	\$7,866.70	\$607	(\$485)	\$7,988.01	\$123,338.68
20	0.3340	24,141.00	\$8,062.19	\$604	(\$483)	\$8,182.89	\$131,521.58
21	0.3440	24,020.29	\$8,262.53	\$601	(\$480)	\$8,382.64	\$139,904.21
22	0.3543	23,900.19	\$8,467.86	\$598	(\$478)	\$8,587.36	\$148,491.57
23	0.3649	23,780.69	\$8,678.28	\$595	(\$476)	\$8,797.19	\$157,288.76
24	0.3759	23,661.79	\$8,893.94	\$592	(\$473)	\$9,012.25	\$166,301.01
25	0.3872	23,543.48	\$9,114.95	\$589	(\$471)	\$9,232.67	\$175,533.68

Engine 3

Design Goal: Provide
88% of average annual electricity

Existing Conditions

Average Annual Electrical Usage (kWh) 21,219
Current Utility Price (\$/kWh) \$0.2021

Calculations

Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 16.184
Space Needed (sq-ft) 1,618
Annual Solar kWh (PV Watts) 18,720
Net System installation Cost (\$9/kWh) \$145,656
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$245,656
Materials \$171,959
Labor \$73,697
Engineer's Opinion of Probable Cost \$307,070

Simple Payback	
Cost	\$307,070
Utility Savings	\$3,783.60
RECs	\$468
MC	(\$374)
Payback	79.2

Assumptions

Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.2021	18,720.02	\$3,783.60	\$468	(\$374)	\$3,877.20	\$3,877.20
2	0.2082	18,626.42	\$3,877.62	\$466	(\$373)	\$3,970.75	\$7,847.95
3	0.2144	18,533.29	\$3,973.98	\$463	(\$371)	\$4,066.64	\$11,914.59
4	0.2209	18,440.62	\$4,072.73	\$461	(\$369)	\$4,164.93	\$16,079.52
5	0.2275	18,348.42	\$4,173.94	\$459	(\$367)	\$4,265.68	\$20,345.20
6	0.2343	18,256.68	\$4,277.66	\$456	(\$365)	\$4,368.94	\$24,714.15
7	0.2413	18,165.39	\$4,383.96	\$454	(\$363)	\$4,474.79	\$29,188.93
8	0.2486	18,074.57	\$4,492.90	\$452	(\$361)	\$4,583.27	\$33,772.21
9	0.2560	17,984.19	\$4,604.55	\$450	(\$360)	\$4,694.47	\$38,466.68
10	0.2637	17,894.27	\$4,718.97	\$447	(\$358)	\$4,808.44	\$43,275.12
11	0.2716	17,804.80	\$4,836.24	\$445	(\$356)	\$4,925.26	\$48,200.38
12	0.2798	17,715.78	\$4,956.42	\$443	(\$354)	\$5,045.00	\$53,245.38
13	0.2882	17,627.20	\$5,079.59	\$441	(\$353)	\$5,167.72	\$58,413.11
14	0.2968	17,539.06	\$5,205.81	\$438	(\$351)	\$5,293.51	\$63,706.62
15	0.3057	17,451.37	\$5,335.18	\$436	(\$349)	\$5,422.44	\$69,129.05
16	0.3149	17,364.11	\$5,467.76	\$434	(\$347)	\$5,554.58	\$74,683.63
17	0.3243	17,277.29	\$5,603.63	\$432	(\$346)	\$5,690.02	\$80,373.65
18	0.3341	17,190.90	\$5,742.88	\$430	(\$344)	\$5,828.84	\$86,202.49
19	0.3441	17,104.95	\$5,885.59	\$428	(\$342)	\$5,971.12	\$92,173.60
20	0.3544	17,019.42	\$6,031.85	\$425	(\$340)	\$6,116.95	\$98,290.55
21	0.3650	16,934.33	\$6,181.74	\$423	(\$339)	\$6,266.41	\$104,556.96
22	0.3760	16,849.65	\$6,335.36	\$421	(\$337)	\$6,419.61	\$110,976.57
23	0.3873	16,765.41	\$6,492.79	\$419	(\$335)	\$6,576.62	\$117,553.19
24	0.3989	16,681.58	\$6,654.14	\$417	(\$334)	\$6,737.55	\$124,290.73
25	0.4109	16,598.17	\$6,819.49	\$415	(\$332)	\$6,902.48	\$131,193.22

Engine 4

Design Goal: Provide
98% of average annual electricity

Existing Conditions

Average Annual Electrical Usage (kWh) 29,620
Current Utility Price (\$/kWh) \$0.1895

Calculations

Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 25,004
Space Needed (sq-ft) 2,500
Annual Solar kWh (PV Watts) 28,922
Net System installation Cost (\$9/kWh) \$225,036
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$325,036
Materials \$227,525
Labor \$97,511
Engineer's Opinion of Probable Cost \$406,295

Simple Payback	
Cost	\$406,295
Utility Savings	\$5,480.24
RECs	\$723
MC	(\$578)
Payback	72.2

Assumptions

Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1895	28,922.11	\$5,480.24	\$723	(\$578)	\$5,624.85	\$5,624.85
2	0.1952	28,777.50	\$5,616.43	\$719	(\$576)	\$5,760.31	\$11,385.17
3	0.2010	28,633.61	\$5,755.99	\$716	(\$573)	\$5,899.16	\$17,284.33
4	0.2071	28,490.44	\$5,899.03	\$712	(\$570)	\$6,041.48	\$23,325.81
5	0.2133	28,347.99	\$6,045.62	\$709	(\$567)	\$6,187.36	\$29,513.17
6	0.2197	28,206.25	\$6,195.86	\$705	(\$564)	\$6,336.89	\$35,850.06
7	0.2263	28,065.22	\$6,349.82	\$702	(\$561)	\$6,490.15	\$42,340.21
8	0.2330	27,924.89	\$6,507.62	\$698	(\$558)	\$6,647.24	\$48,987.45
9	0.2400	27,785.27	\$6,669.33	\$695	(\$556)	\$6,808.26	\$55,795.70
10	0.2472	27,646.34	\$6,835.06	\$691	(\$553)	\$6,973.29	\$62,769.00
11	0.2546	27,508.11	\$7,004.91	\$688	(\$550)	\$7,142.45	\$69,911.45
12	0.2623	27,370.57	\$7,178.99	\$684	(\$547)	\$7,315.84	\$77,227.29
13	0.2702	27,233.72	\$7,357.38	\$681	(\$545)	\$7,493.55	\$84,720.84
14	0.2783	27,097.55	\$7,540.21	\$677	(\$542)	\$7,675.70	\$92,396.54
15	0.2866	26,962.06	\$7,727.59	\$674	(\$539)	\$7,862.40	\$100,258.94
16	0.2952	26,827.25	\$7,919.62	\$671	(\$537)	\$8,053.76	\$108,312.70
17	0.3041	26,693.11	\$8,116.42	\$667	(\$534)	\$8,249.89	\$116,562.58
18	0.3132	26,559.65	\$8,318.11	\$664	(\$531)	\$8,450.91	\$125,013.50
19	0.3226	26,426.85	\$8,524.82	\$661	(\$529)	\$8,656.95	\$133,670.45
20	0.3323	26,294.71	\$8,736.66	\$657	(\$526)	\$8,868.14	\$142,538.59
21	0.3422	26,163.24	\$8,953.77	\$654	(\$523)	\$9,084.58	\$151,623.17
22	0.3525	26,032.42	\$9,176.27	\$651	(\$521)	\$9,306.43	\$160,929.60
23	0.3631	25,902.26	\$9,404.30	\$648	(\$518)	\$9,533.81	\$170,463.41
24	0.3740	25,772.75	\$9,638.00	\$644	(\$515)	\$9,766.86	\$180,230.27
25	0.3852	25,643.89	\$9,877.50	\$641	(\$513)	\$10,005.72	\$190,235.99

Engine 5

Design Goal: Provide
99% of average annual electricity

Existing Conditions

Average Annual Electrical Usage (kWh) 28,169
Current Utility Price (\$/kWh) \$0.1983

Calculations

Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 24.15
Space Needed (sq-ft) 2,415
Annual Solar kWh (PV Watts) 27,934
Net System installation Cost (\$9/kWh) \$217,350
Electrical Service Modification Cost \$100,000
Total System Installation Cost **\$317,350**
Materials \$222,145
Labor \$95,205
Engineer's Opinion of Probable Cost \$396,688

Simple Payback	
Cost	\$396,688
Utility Savings	\$5,538.96
RECs	\$698
MC	\$2
Payback	63.6

Assumptions

Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1983	27,934.29	\$5,538.96	\$698	(\$559)	\$5,678.64	\$5,678.64
2	0.2042	27,794.61	\$5,676.61	\$695	(\$556)	\$5,815.58	\$11,494.22
3	0.2104	27,655.64	\$5,817.67	\$691	(\$553)	\$5,955.95	\$17,450.17
4	0.2167	27,517.36	\$5,962.24	\$688	(\$550)	\$6,099.83	\$23,550.00
5	0.2232	27,379.78	\$6,110.40	\$684	(\$548)	\$6,247.30	\$29,797.30
6	0.2299	27,242.88	\$6,262.25	\$681	(\$545)	\$6,398.46	\$36,195.76
7	0.2368	27,106.66	\$6,417.86	\$678	(\$542)	\$6,553.40	\$42,749.15
8	0.2439	26,971.13	\$6,577.35	\$674	(\$539)	\$6,712.20	\$49,461.36
9	0.2512	26,836.27	\$6,740.79	\$671	(\$537)	\$6,874.98	\$56,336.33
10	0.2587	26,702.09	\$6,908.30	\$668	(\$534)	\$7,041.81	\$63,378.15
11	0.2665	26,568.58	\$7,079.97	\$664	(\$531)	\$7,212.82	\$70,590.96
12	0.2745	26,435.74	\$7,255.91	\$661	(\$529)	\$7,388.09	\$77,979.05
13	0.2827	26,303.56	\$7,436.22	\$658	(\$526)	\$7,567.74	\$85,546.79
14	0.2912	26,172.04	\$7,621.01	\$654	(\$523)	\$7,751.87	\$93,298.66
15	0.2999	26,041.18	\$7,810.39	\$651	(\$521)	\$7,940.60	\$101,239.26
16	0.3089	25,910.98	\$8,004.48	\$648	(\$518)	\$8,134.04	\$109,373.30
17	0.3182	25,781.42	\$8,203.39	\$645	(\$516)	\$8,332.30	\$117,705.60
18	0.3277	25,652.51	\$8,407.25	\$641	(\$513)	\$8,535.51	\$126,241.11
19	0.3376	25,524.25	\$8,616.17	\$638	(\$510)	\$8,743.79	\$134,984.90
20	0.3477	25,396.63	\$8,830.28	\$635	(\$508)	\$8,957.26	\$143,942.16
21	0.3581	25,269.65	\$9,049.71	\$632	(\$505)	\$9,176.06	\$153,118.22
22	0.3689	25,143.30	\$9,274.60	\$629	(\$503)	\$9,400.31	\$162,518.53
23	0.3799	25,017.58	\$9,505.07	\$625	(\$500)	\$9,630.16	\$172,148.69
24	0.3913	24,892.49	\$9,741.27	\$622	(\$498)	\$9,865.73	\$182,014.42
25	0.4031	24,768.03	\$9,983.34	\$619	(\$495)	\$10,107.18	\$192,121.61

Senior Center
Design Goal: Provide
100% of average annual electricity

Existing Conditions
Average Annual Electrical Usage (kWh) 307,573
Current Utility Price (\$/kWh) \$0.1939

Calculations
Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 320.784
Space Needed (sq-ft) 32,078
Annual Solar kWh (PV Watts) 371,051
Net System installation Cost (\$9/kWh) \$2,887,056
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$2,987,056
Materials \$2,090,939
Labor \$896,117
Engineer's Opinion of Probable Cost \$3,733,820

Assumptions
Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Simple Payback	
Cost	\$3,733,820
Utility Savings	\$71,944.26
RECs	\$9,276
MC	(\$7,421)
Payback	50.6

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1939	371,050.60	\$71,944.26	\$9,276	(\$7,421)	\$73,799.51	\$73,799.51
2	0.1997	369,195.34	\$73,732.08	\$9,230	(\$7,384)	\$75,578.05	\$149,377.57
3	0.2057	367,349.37	\$75,564.32	\$9,184	(\$7,347)	\$77,401.06	\$226,778.63
4	0.2119	365,512.62	\$77,442.09	\$9,138	(\$7,310)	\$79,269.65	\$306,048.28
5	0.2182	363,685.06	\$79,366.53	\$9,092	(\$7,274)	\$81,184.95	\$387,233.24
6	0.2248	361,866.63	\$81,338.78	\$9,047	(\$7,237)	\$83,148.12	\$470,381.35
7	0.2315	360,057.30	\$83,360.05	\$9,001	(\$7,201)	\$85,160.34	\$555,541.69
8	0.2385	358,257.01	\$85,431.55	\$8,956	(\$7,165)	\$87,222.84	\$642,764.53
9	0.2456	356,465.73	\$87,554.53	\$8,912	(\$7,129)	\$89,336.85	\$732,101.38
10	0.2530	354,683.40	\$89,730.26	\$8,867	(\$7,094)	\$91,503.67	\$823,605.06
11	0.2606	352,909.98	\$91,960.05	\$8,823	(\$7,058)	\$93,724.60	\$917,329.66
12	0.2684	351,145.43	\$94,245.26	\$8,779	(\$7,023)	\$96,000.99	\$1,013,330.64
13	0.2764	349,389.70	\$96,587.25	\$8,735	(\$6,988)	\$98,334.20	\$1,111,664.85
14	0.2847	347,642.75	\$98,987.45	\$8,691	(\$6,953)	\$100,725.66	\$1,212,390.51
15	0.2933	345,904.54	\$101,447.29	\$8,648	(\$6,918)	\$103,176.81	\$1,315,567.32
16	0.3021	344,175.02	\$103,968.25	\$8,604	(\$6,884)	\$105,689.13	\$1,421,256.44
17	0.3111	342,454.14	\$106,551.86	\$8,561	(\$6,849)	\$108,264.13	\$1,529,520.57
18	0.3205	340,741.87	\$109,199.68	\$8,519	(\$6,815)	\$110,903.38	\$1,640,423.96
19	0.3301	339,038.16	\$111,913.29	\$8,476	(\$6,781)	\$113,608.48	\$1,754,032.44
20	0.3400	337,342.97	\$114,694.33	\$8,434	(\$6,747)	\$116,381.05	\$1,870,413.48
21	0.3502	335,656.26	\$117,544.49	\$8,391	(\$6,713)	\$119,222.77	\$1,989,636.25
22	0.3607	333,977.98	\$120,465.47	\$8,349	(\$6,680)	\$122,135.36	\$2,111,771.61
23	0.3715	332,308.09	\$123,459.03	\$8,308	(\$6,646)	\$125,120.57	\$2,236,892.18
24	0.3827	330,646.55	\$126,526.99	\$8,266	(\$6,613)	\$128,180.22	\$2,365,072.40
25	0.3941	328,993.31	\$129,671.19	\$8,225	(\$6,580)	\$131,316.15	\$2,496,388.56

Main Library

Design Goal: Provide
4% of average annual electricity

Existing Conditions

Average Annual Electrical Usage (kWh) 606,363
Current Utility Price (\$/kWh) \$0.1743

Calculations

Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 20.189
Space Needed (sq-ft) 2,019
Annual Solar kWh (PV Watts) 23,353
Net System installation Cost (\$9/kWh) \$181,701
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$281,701
Materials \$197,191
Labor \$84,510
Engineer's Opinion of Probable Cost \$352,126

Simple Payback	
Cost	\$352,126
Utility Savings	\$4,070.41
RECs	\$584
MC	(\$467)
Payback	84.1

Assumptions

Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1743	23,352.60	\$4,070.41	\$584	(\$467)	\$4,187.17	\$4,187.17
2	0.1795	23,235.84	\$4,171.56	\$581	(\$465)	\$4,287.73	\$8,474.90
3	0.1849	23,119.66	\$4,275.22	\$578	(\$462)	\$4,390.82	\$12,865.72
4	0.1905	23,004.06	\$4,381.46	\$575	(\$460)	\$4,496.48	\$17,362.20
5	0.1962	22,889.04	\$4,490.34	\$572	(\$458)	\$4,604.78	\$21,966.98
6	0.2021	22,774.59	\$4,601.92	\$569	(\$455)	\$4,715.79	\$26,682.77
7	0.2081	22,660.72	\$4,716.28	\$567	(\$453)	\$4,829.58	\$31,512.36
8	0.2144	22,547.42	\$4,833.48	\$564	(\$451)	\$4,946.22	\$36,458.57
9	0.2208	22,434.68	\$4,953.59	\$561	(\$449)	\$5,065.76	\$41,524.34
10	0.2274	22,322.51	\$5,076.69	\$558	(\$446)	\$5,188.30	\$46,712.64
11	0.2342	22,210.89	\$5,202.84	\$555	(\$444)	\$5,313.90	\$52,026.53
12	0.2413	22,099.84	\$5,332.13	\$552	(\$442)	\$5,442.63	\$57,469.17
13	0.2485	21,989.34	\$5,464.64	\$550	(\$440)	\$5,574.58	\$63,043.75
14	0.2560	21,879.39	\$5,600.43	\$547	(\$438)	\$5,709.83	\$68,753.58
15	0.2636	21,770.00	\$5,739.60	\$544	(\$435)	\$5,848.45	\$74,602.04
16	0.2716	21,661.15	\$5,882.23	\$542	(\$433)	\$5,990.54	\$80,592.58
17	0.2797	21,552.84	\$6,028.41	\$539	(\$431)	\$6,136.17	\$86,728.75
18	0.2881	21,445.08	\$6,178.21	\$536	(\$429)	\$6,285.44	\$93,014.19
19	0.2967	21,337.85	\$6,331.74	\$533	(\$427)	\$6,438.43	\$99,452.62
20	0.3056	21,231.16	\$6,489.09	\$531	(\$425)	\$6,595.24	\$106,047.86
21	0.3148	21,125.01	\$6,650.34	\$528	(\$423)	\$6,755.96	\$112,803.82
22	0.3243	21,019.38	\$6,815.60	\$525	(\$420)	\$6,920.70	\$119,724.52
23	0.3340	20,914.28	\$6,984.97	\$523	(\$418)	\$7,089.54	\$126,814.06
24	0.3440	20,809.71	\$7,158.54	\$520	(\$416)	\$7,262.59	\$134,076.65
25	0.3543	20,705.66	\$7,336.43	\$518	(\$414)	\$7,439.96	\$141,516.61

Animal Control

Design Goal: Provide
16% of average annual electricity

Existing Conditions

Average Annual Electrical Usage (kWh) 101,989
Current Utility Price (\$/kWh) \$0.1831

Calculations

Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 14.4
Space Needed (sq-ft) 1,440
Annual Solar kWh (PV Watts) 16,656
Net System installation Cost (\$9/kWh) \$129,600
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$229,600
Materials \$160,720
Labor \$68,880
Engineer's Opinion of Probable Cost \$287,000

Simple Payback	
Cost	\$287,000
Utility Savings	\$3,049.77
RECs	\$416
MC	(\$333)
Payback	91.6

Assumptions

Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1831	16,656.47	\$3,049.77	\$416	(\$333)	\$3,133.06	\$3,133.06
2	0.1886	16,573.19	\$3,125.56	\$414	(\$331)	\$3,208.43	\$6,341.48
3	0.1942	16,490.32	\$3,203.23	\$412	(\$330)	\$3,285.68	\$9,627.17
4	0.2001	16,407.87	\$3,282.83	\$410	(\$328)	\$3,364.87	\$12,992.04
5	0.2061	16,325.83	\$3,364.41	\$408	(\$327)	\$3,446.04	\$16,438.08
6	0.2123	16,244.20	\$3,448.02	\$406	(\$325)	\$3,529.24	\$19,967.31
7	0.2186	16,162.98	\$3,533.70	\$404	(\$323)	\$3,614.51	\$23,581.83
8	0.2252	16,082.16	\$3,621.51	\$402	(\$322)	\$3,701.92	\$27,283.75
9	0.2319	16,001.75	\$3,711.51	\$400	(\$320)	\$3,791.51	\$31,075.26
10	0.2389	15,921.74	\$3,803.74	\$398	(\$318)	\$3,883.35	\$34,958.61
11	0.2461	15,842.14	\$3,898.26	\$396	(\$317)	\$3,977.47	\$38,936.08
12	0.2535	15,762.93	\$3,995.13	\$394	(\$315)	\$4,073.95	\$43,010.02
13	0.2611	15,684.11	\$4,094.41	\$392	(\$314)	\$4,172.83	\$47,182.86
14	0.2689	15,605.69	\$4,196.16	\$390	(\$312)	\$4,274.18	\$51,457.04
15	0.2770	15,527.66	\$4,300.43	\$388	(\$311)	\$4,378.07	\$55,835.11
16	0.2853	15,450.02	\$4,407.30	\$386	(\$309)	\$4,484.55	\$60,319.66
17	0.2938	15,372.77	\$4,516.82	\$384	(\$307)	\$4,593.68	\$64,913.34
18	0.3026	15,295.91	\$4,629.06	\$382	(\$306)	\$4,705.54	\$69,618.88
19	0.3117	15,219.43	\$4,744.09	\$380	(\$304)	\$4,820.19	\$74,439.07
20	0.3211	15,143.33	\$4,861.98	\$379	(\$303)	\$4,937.70	\$79,376.77
21	0.3307	15,067.62	\$4,982.80	\$377	(\$301)	\$5,058.14	\$84,434.91
22	0.3406	14,992.28	\$5,106.63	\$375	(\$300)	\$5,181.59	\$89,616.50
23	0.3508	14,917.32	\$5,233.53	\$373	(\$298)	\$5,308.11	\$94,924.61
24	0.3614	14,842.73	\$5,363.58	\$371	(\$297)	\$5,437.79	\$100,362.41
25	0.3722	14,768.52	\$5,496.86	\$369	(\$295)	\$5,570.71	\$105,933.11

City Yard
Design Goal: Provide
100% of average annual electricity

Existing Conditions
Average Annual Electrical Usage (kWh) 25,061
Current Utility Price (\$/kWh) \$0.1966

Calculations
Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 136.44
Space Needed (sq-ft) 13,644
Annual Solar kWh (PV Watts) 157,820
Net System installation Cost (\$9/kWh) \$1,227,960
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$1,327,960
Materials \$929,572
Labor \$398,388
Engineer's Opinion of Probable Cost \$1,659,950

Assumptions
Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Simple Payback	
Cost	\$1,659,950
Utility Savings	\$31,027.42
RECs	\$3,946
MC	\$2
Payback	47.5

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1966	157,820.04	\$31,027.42	\$3,946	(\$3,156)	\$31,816.52	\$31,816.52
2	0.2025	157,030.94	\$31,798.45	\$3,926	(\$3,141)	\$32,583.61	\$64,400.13
3	0.2086	156,245.78	\$32,588.64	\$3,906	(\$3,125)	\$33,369.87	\$97,770.00
4	0.2148	155,464.55	\$33,398.47	\$3,887	(\$3,109)	\$34,175.79	\$131,945.79
5	0.2213	154,687.23	\$34,228.42	\$3,867	(\$3,094)	\$35,001.86	\$166,947.65
6	0.2279	153,913.80	\$35,079.00	\$3,848	(\$3,078)	\$35,848.57	\$202,796.22
7	0.2348	153,144.23	\$35,950.71	\$3,829	(\$3,063)	\$36,716.43	\$239,512.65
8	0.2418	152,378.51	\$36,844.09	\$3,809	(\$3,048)	\$37,605.98	\$277,118.63
9	0.2490	151,616.61	\$37,759.66	\$3,790	(\$3,032)	\$38,517.75	\$315,636.37
10	0.2565	150,858.53	\$38,697.99	\$3,771	(\$3,017)	\$39,452.28	\$355,088.66
11	0.2642	150,104.24	\$39,659.63	\$3,753	(\$3,002)	\$40,410.16	\$395,498.81
12	0.2721	149,353.72	\$40,645.18	\$3,734	(\$2,987)	\$41,391.95	\$436,890.76
13	0.2803	148,606.95	\$41,655.21	\$3,715	(\$2,972)	\$42,398.24	\$479,289.00
14	0.2887	147,863.91	\$42,690.34	\$3,697	(\$2,957)	\$43,429.66	\$522,718.66
15	0.2974	147,124.59	\$43,751.20	\$3,678	(\$2,942)	\$44,486.82	\$567,205.48
16	0.3063	146,388.97	\$44,838.41	\$3,660	(\$2,928)	\$45,570.36	\$612,775.84
17	0.3155	145,657.03	\$45,952.65	\$3,641	(\$2,913)	\$46,680.93	\$659,456.77
18	0.3249	144,928.74	\$47,094.57	\$3,623	(\$2,899)	\$47,819.22	\$707,275.99
19	0.3347	144,204.10	\$48,264.87	\$3,605	(\$2,884)	\$48,985.89	\$756,261.88
20	0.3447	143,483.08	\$49,464.25	\$3,587	(\$2,870)	\$50,181.67	\$806,443.55
21	0.3551	142,765.66	\$50,693.44	\$3,569	(\$2,855)	\$51,407.27	\$857,850.82
22	0.3657	142,051.83	\$51,953.17	\$3,551	(\$2,841)	\$52,663.43	\$910,514.25
23	0.3767	141,341.57	\$53,244.21	\$3,534	(\$2,827)	\$53,950.92	\$964,465.17
24	0.3880	140,634.87	\$54,567.33	\$3,516	(\$2,813)	\$55,270.50	\$1,019,735.67
25	0.3996	139,931.69	\$55,923.33	\$3,498	(\$2,799)	\$56,622.98	\$1,076,358.65

Plant
Design Goal: Provide
61% of average annual electricity

Existing Conditions
Average Annual Electrical Usage (kWh) 3,570,896
Current Utility Price (\$/kWh) \$0.1540

Calculations
Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 1884.89
Space Needed (sq-ft) 188,489
Annual Solar kWh (PV Watts) 2,180,251
Net System installation Cost (\$9/kWh) \$16,964,010
Electrical Service Modification Cost \$100,000
Total System Installation Cost **\$17,064,010**
Materials \$11,944,807
Labor \$5,119,203
Engineer's Opinion of Probable Cost \$21,330,013

Assumptions
Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Simple Payback	
Cost	\$21,330,013
Utility Savings	\$335,662.84
RECs	\$54,506
MC	(\$43,605)
Payback	61.5

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1540	2,180,250.75	\$335,662.84	\$54,506	(\$43,605)	\$346,564.09	\$346,564.09
2	0.1586	2,169,349.50	\$344,004.06	\$54,234	(\$43,387)	\$354,850.81	\$701,414.90
3	0.1633	2,158,502.75	\$352,552.56	\$53,963	(\$43,170)	\$363,345.08	\$1,064,759.98
4	0.1682	2,147,710.23	\$361,313.49	\$53,693	(\$42,954)	\$372,052.05	\$1,436,812.03
5	0.1733	2,136,971.68	\$370,292.13	\$53,424	(\$42,739)	\$380,976.99	\$1,817,789.02
6	0.1785	2,126,286.82	\$379,493.89	\$53,157	(\$42,526)	\$390,125.33	\$2,207,914.35
7	0.1838	2,115,655.39	\$388,924.32	\$52,891	(\$42,313)	\$399,502.59	\$2,607,416.94
8	0.1893	2,105,077.11	\$398,589.09	\$52,627	(\$42,102)	\$409,114.47	\$3,016,531.41
9	0.1950	2,094,551.73	\$408,494.03	\$52,364	(\$41,891)	\$418,966.78	\$3,435,498.20
10	0.2009	2,084,078.97	\$418,645.10	\$52,102	(\$41,682)	\$429,065.50	\$3,864,563.70
11	0.2069	2,073,658.57	\$429,048.43	\$51,841	(\$41,473)	\$439,416.73	\$4,303,980.42
12	0.2131	2,063,290.28	\$439,710.29	\$51,582	(\$41,266)	\$450,026.74	\$4,754,007.16
13	0.2195	2,052,973.83	\$450,637.09	\$51,324	(\$41,059)	\$460,901.96	\$5,214,909.12
14	0.2261	2,042,708.96	\$461,835.42	\$51,068	(\$40,854)	\$472,048.96	\$5,686,958.08
15	0.2329	2,032,495.42	\$473,312.03	\$50,812	(\$40,650)	\$483,474.51	\$6,170,432.58
16	0.2399	2,022,332.94	\$485,073.83	\$50,558	(\$40,447)	\$495,185.50	\$6,665,618.08
17	0.2471	2,012,221.27	\$497,127.92	\$50,306	(\$40,244)	\$507,189.02	\$7,172,807.11
18	0.2545	2,002,160.17	\$509,481.55	\$50,054	(\$40,043)	\$519,492.35	\$7,692,299.45
19	0.2621	1,992,149.37	\$522,142.16	\$49,804	(\$39,843)	\$532,102.91	\$8,224,402.36
20	0.2700	1,982,188.62	\$535,117.40	\$49,555	(\$39,644)	\$545,028.34	\$8,769,430.70
21	0.2781	1,972,277.68	\$548,415.06	\$49,307	(\$39,446)	\$558,276.45	\$9,327,707.15
22	0.2864	1,962,416.29	\$562,043.18	\$49,060	(\$39,248)	\$571,855.26	\$9,899,562.41
23	0.2950	1,952,604.21	\$576,009.95	\$48,815	(\$39,052)	\$585,772.97	\$10,485,335.38
24	0.3038	1,942,841.19	\$590,323.80	\$48,571	(\$38,857)	\$600,038.00	\$11,085,373.39
25	0.3130	1,933,126.98	\$604,993.34	\$48,328	(\$38,663)	\$614,658.98	\$11,700,032.36

Broad St Pump Station

Design Goal: Provide
100% of average annual electricity

Existing Conditions

Average Annual Electrical Usage (kWh) 23,866
Current Utility Price (\$/kWh) \$0.1811

Calculations

Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 28.8
Space Needed (sq-ft) 2,880
Annual Solar kWh (PV Watts) 33,313
Net System installation Cost (\$9/kWh) \$259,200
Electrical Service Modification Cost \$100,000
Total System Installation Cost **\$359,200**
Materials \$251,440
Labor \$107,760
Engineer's Opinion of Probable Cost \$449,000

Simple Payback	
Cost	\$449,000
Utility Savings	\$6,034.41
RECs	\$833
MC	(\$666)
Payback	72.4

Assumptions

Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1811	33,312.94	\$6,034.41	\$833	(\$666)	\$6,200.97	\$6,200.97
2	0.1866	33,146.37	\$6,184.36	\$829	(\$663)	\$6,350.10	\$12,551.07
3	0.1922	32,980.64	\$6,338.05	\$825	(\$660)	\$6,502.95	\$19,054.02
4	0.1979	32,815.74	\$6,495.55	\$820	(\$656)	\$6,659.62	\$25,713.64
5	0.2039	32,651.66	\$6,656.96	\$816	(\$653)	\$6,820.22	\$32,533.86
6	0.2100	32,488.40	\$6,822.39	\$812	(\$650)	\$6,984.83	\$39,518.69
7	0.2163	32,325.96	\$6,991.92	\$808	(\$647)	\$7,153.55	\$46,672.24
8	0.2228	32,164.33	\$7,165.67	\$804	(\$643)	\$7,326.49	\$53,998.74
9	0.2295	32,003.51	\$7,343.74	\$800	(\$640)	\$7,503.76	\$61,502.49
10	0.2364	31,843.49	\$7,526.23	\$796	(\$637)	\$7,685.45	\$69,187.94
11	0.2434	31,684.27	\$7,713.26	\$792	(\$634)	\$7,871.68	\$77,059.62
12	0.2507	31,525.85	\$7,904.93	\$788	(\$631)	\$8,062.56	\$85,122.18
13	0.2583	31,368.22	\$8,101.37	\$784	(\$627)	\$8,258.21	\$93,380.39
14	0.2660	31,211.38	\$8,302.69	\$780	(\$624)	\$8,458.75	\$101,839.13
15	0.2740	31,055.32	\$8,509.01	\$776	(\$621)	\$8,664.29	\$110,503.42
16	0.2822	30,900.05	\$8,720.46	\$773	(\$618)	\$8,874.96	\$119,378.38
17	0.2907	30,745.55	\$8,937.16	\$769	(\$615)	\$9,090.89	\$128,469.27
18	0.2994	30,591.82	\$9,159.25	\$765	(\$612)	\$9,312.21	\$137,781.48
19	0.3084	30,438.86	\$9,386.86	\$761	(\$609)	\$9,539.05	\$147,320.53
20	0.3176	30,286.67	\$9,620.12	\$757	(\$606)	\$9,771.55	\$157,092.09
21	0.3272	30,135.23	\$9,859.18	\$753	(\$603)	\$10,009.86	\$167,101.94
22	0.3370	29,984.56	\$10,104.18	\$750	(\$600)	\$10,254.10	\$177,356.05
23	0.3471	29,834.63	\$10,355.27	\$746	(\$597)	\$10,504.44	\$187,860.49
24	0.3575	29,685.46	\$10,612.60	\$742	(\$594)	\$10,761.03	\$198,621.52
25	0.3682	29,537.03	\$10,876.32	\$738	(\$591)	\$11,024.01	\$209,645.53

Cherry Hill Pump Station

Design Goal: Provide
0.2% of average annual electricity

Existing Conditions

Average Annual Electrical Usage (kWh) 1,130,318
Current Utility Price (\$/kWh) \$0.1738

Calculations

Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 2.25
Space Needed (sq-ft) 225
Annual Solar kWh (PV Watts) 2,603
Net System installation Cost (\$9/kWh) \$20,250
Electrical Service Modification Cost \$100,000
Total System Installation Cost \$120,250
Materials \$84,175
Labor \$36,075
Engineer's Opinion of Probable Cost \$150,313

Assumptions

Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Simple Payback	
Cost	\$150,313
Utility Savings	\$452.36
RECs	\$65
MC	\$2
Payback	289.4

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	0.1738	2,602.57	\$452.36	\$65	(\$52)	\$465.37	\$465.37
2	0.1790	2,589.56	\$463.60	\$65	(\$52)	\$476.54	\$941.91
3	0.1844	2,576.61	\$475.12	\$64	(\$52)	\$488.00	\$1,429.91
4	0.1899	2,563.73	\$486.92	\$64	(\$51)	\$499.74	\$1,929.65
5	0.1956	2,550.91	\$499.02	\$64	(\$51)	\$511.78	\$2,441.43
6	0.2015	2,538.16	\$511.42	\$63	(\$51)	\$524.11	\$2,965.55
7	0.2075	2,525.47	\$524.13	\$63	(\$51)	\$536.76	\$3,502.31
8	0.2138	2,512.84	\$537.16	\$63	(\$50)	\$549.72	\$4,052.03
9	0.2202	2,500.27	\$550.51	\$63	(\$50)	\$563.01	\$4,615.04
10	0.2268	2,487.77	\$564.19	\$62	(\$50)	\$576.62	\$5,191.66
11	0.2336	2,475.33	\$578.21	\$62	(\$50)	\$590.58	\$5,782.24
12	0.2406	2,462.96	\$592.57	\$62	(\$49)	\$604.89	\$6,387.13
13	0.2478	2,450.64	\$607.30	\$61	(\$49)	\$619.55	\$7,006.68
14	0.2552	2,438.39	\$622.39	\$61	(\$49)	\$634.58	\$7,641.27
15	0.2629	2,426.20	\$637.86	\$61	(\$49)	\$649.99	\$8,291.26
16	0.2708	2,414.07	\$653.71	\$60	(\$48)	\$665.78	\$8,957.04
17	0.2789	2,402.00	\$669.95	\$60	(\$48)	\$681.96	\$9,639.00
18	0.2873	2,389.99	\$686.60	\$60	(\$48)	\$698.55	\$10,337.55
19	0.2959	2,378.04	\$703.66	\$59	(\$48)	\$715.55	\$11,053.10
20	0.3048	2,366.15	\$721.15	\$59	(\$47)	\$732.98	\$11,786.08
21	0.3139	2,354.31	\$739.07	\$59	(\$47)	\$750.84	\$12,536.93
22	0.3233	2,342.54	\$757.44	\$59	(\$47)	\$769.15	\$13,306.07
23	0.3330	2,330.83	\$776.26	\$58	(\$47)	\$787.91	\$14,093.99
24	0.3430	2,319.18	\$795.55	\$58	(\$46)	\$807.14	\$14,901.13
25	0.3533	2,307.58	\$815.32	\$58	(\$46)	\$826.86	\$15,727.99

East Main Pump Station

Design Goal: Provide
100% of average annual electricity

Existing Conditions

Average Annual Electrical Usage (kWh) 462
Current Utility Price (\$/kWh) \$1.2696

Calculations

Solar Rating (Zip Code: 06010) 4.65 kWh/sq-m/day
Solar Capacity Required (kW) 6.75
Space Needed (sq-ft) 675
Annual Solar kWh (PV Watts) 7,808
Net System installation Cost (\$9/kWh) \$60,750
Electrical Service Modification Cost \$100,000
Total System Installation Cost **\$160,750**
Materials \$112,525
Labor \$48,225
Engineer's Opinion of Probable Cost \$200,938

Assumptions

Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs 2%

Simple Payback	
Cost	\$200,938
Utility Savings	\$9,912.98
RECs	\$195
MC	(\$156)
Payback	20.2

Year	Utility Price	Solar kWh	Utility Savings	Renewable Energy Credits	Maintenance Costs	Annual Cash Flow	Cummulative Cash Flow
Install							
1	1.2696	7,807.72	\$9,912.98	\$195	(\$156)	\$9,952.02	\$9,952.02
2	1.3077	7,768.68	\$10,159.32	\$194	(\$155)	\$10,198.16	\$20,150.18
3	1.3470	7,729.84	\$10,411.78	\$193	(\$155)	\$10,450.43	\$30,600.61
4	1.3874	7,691.19	\$10,670.51	\$192	(\$154)	\$10,708.97	\$41,309.58
5	1.4290	7,652.73	\$10,935.67	\$191	(\$153)	\$10,973.94	\$52,283.52
6	1.4719	7,614.47	\$11,207.43	\$190	(\$152)	\$11,245.50	\$63,529.02
7	1.5160	7,576.40	\$11,485.93	\$189	(\$152)	\$11,523.81	\$75,052.83
8	1.5615	7,538.51	\$11,771.36	\$188	(\$151)	\$11,809.05	\$86,861.88
9	1.6083	7,500.82	\$12,063.87	\$188	(\$150)	\$12,101.38	\$98,963.26
10	1.6566	7,463.32	\$12,363.66	\$187	(\$149)	\$12,400.98	\$111,364.23
11	1.7063	7,426.00	\$12,670.90	\$186	(\$149)	\$12,708.03	\$124,072.26
12	1.7575	7,388.87	\$12,985.77	\$185	(\$148)	\$13,022.71	\$137,094.98
13	1.8102	7,351.93	\$13,308.47	\$184	(\$147)	\$13,345.23	\$150,440.20
14	1.8645	7,315.17	\$13,639.18	\$183	(\$146)	\$13,675.76	\$164,115.96
15	1.9204	7,278.59	\$13,978.12	\$182	(\$146)	\$14,014.51	\$178,130.47
16	1.9781	7,242.20	\$14,325.47	\$181	(\$145)	\$14,361.68	\$192,492.15
17	2.0374	7,205.99	\$14,681.46	\$180	(\$144)	\$14,717.49	\$207,209.64
18	2.0985	7,169.96	\$15,046.29	\$179	(\$143)	\$15,082.14	\$222,291.78
19	2.1615	7,134.11	\$15,420.19	\$178	(\$143)	\$15,455.86	\$237,747.65
20	2.2263	7,098.44	\$15,803.39	\$177	(\$142)	\$15,838.88	\$253,586.53
21	2.2931	7,062.94	\$16,196.10	\$177	(\$141)	\$16,231.41	\$269,817.94
22	2.3619	7,027.63	\$16,598.57	\$176	(\$141)	\$16,633.71	\$286,451.65
23	2.4328	6,992.49	\$17,011.05	\$175	(\$140)	\$17,046.01	\$303,497.66
24	2.5057	6,957.53	\$17,433.77	\$174	(\$139)	\$17,468.56	\$320,966.22
25	2.5809	6,922.74	\$17,867.00	\$173	(\$138)	\$17,901.62	\$338,867.84

APPENDIX J

Wind Turbine Energy System Analysis

WindCad Turbine Performance Model

Endurance S-343 Wind Turbine, Grid - Intertie

Prepared For: **Bristol, CT**
Site Location: **Bristol, CT**
Data Source: **NASA Atmospheric Science Data Center**
Date: **11/8/2010**

5 kW

Inputs:

Ave. Wind (m/s) = 4.22
Weibull K = 2
Site Altitude (m) = 0
Wind Shear Exp. = 0.180
Anem. Height (m) = 30
Tower Height (m) = 30
Turbulence Factor = 8.0%

Results:

Hub Average Wind Speed (m/s) = 4.22
Air Density Factor = 0%
Average Output Power (kW) = 0.62
Daily Energy Output (kWh) = 14.9
Annual Energy Output (kWh) = **5,437**
Monthly Energy Output = 453
Percent Operating Time = 58.0%

Weibull Performance Calculations

Wind Speed Bin (m/s)	Power (kW)	Wind Probability (f)	Net kW @ V
1	0.00	8.51%	0.000
2	0.00	14.89%	0.000
3	0.00	17.88%	0.000
4	0.00	17.47%	0.000
5	0.49	14.63%	0.072
6	1.10	10.76%	0.119
7	2.02	7.04%	0.143
8	3.00	4.13%	0.124
9	3.81	2.18%	0.083
10	4.41	1.04%	0.046
11	4.80	0.45%	0.022
12	4.99	0.18%	0.009
13	4.90	0.06%	0.003
14	4.53	0.02%	0.001
15	4.00	0.01%	0.000
16	3.52	0.00%	0.000
17	3.19	0.00%	0.000
18	2.78	0.00%	0.000
19	2.78	0.00%	0.000
20	2.78	0.00%	0.000
2008, BWC	Totals:	99.26%	0.621

Weibull Calculations:

Wind speed probability is calculated as a Weibull curve defined by the average wind speed and a shape factor, K. To facilitate piece-wise integration, the wind speed range is broken down into "bins" of 1 m/s in width (Column 1). For each wind speed bin, instantaneous wind turbine power (W, Column 2)) is multiplied by the Weibull wind speed probability (f, Column 3). This cross product (Net W, Column 4) is the contribution to average turbine power output contributed by wind speeds in that bin. The sum of these contributions is the average power output of the turbine on a continuous, 24 hour, basis. Best results are achieved using annual or monthly average wind speeds. Use of daily or hourly average speeds is not recommended.

WindCad Turbine Performance Model

Endurance S-343 Wind Turbine, Grid - Intertie

Prepared For: **Bristol, CT**
Site Location: **Bristol, CT**
Data Source: **NASA Atmospheric Science Data Center**
Date: **11/8/2010**

5 kW

Inputs:

Ave. Wind (m/s) = 5.17
Weibull K = 2
Site Altitude (m) = 0
Wind Shear Exp. = 0.180
Anem. Height (m) = 30
Tower Height (m) = 30
Turbulence Factor = 8.0%

Results:

Hub Average Wind Speed (m/s) = 5.17
Air Density Factor = 0%
Average Output Power (kW) = 1.11
Daily Energy Output (kWh) = 26.7
Annual Energy Output (kWh) = **9,756**
Monthly Energy Output = 813
Percent Operating Time = 69.6%

Weibull Performance Calculations

Wind Speed Bin (m/s)	Power (kW)	Wind Probability (f)	Net kW @ V
1	0.00	5.75%	0.000
2	0.00	10.53%	0.000
3	0.00	13.62%	0.000
4	0.00	14.76%	0.000
5	0.49	14.13%	0.069
6	1.10	12.24%	0.135
7	2.02	9.71%	0.197
8	3.00	7.12%	0.213
9	3.81	4.84%	0.185
10	4.41	3.06%	0.135
11	4.80	1.81%	0.087
12	4.99	1.00%	0.050
13	4.90	0.51%	0.025
14	4.53	0.25%	0.011
15	4.00	0.11%	0.005
16	3.52	0.05%	0.002
17	3.19	0.02%	0.001
18	2.78	0.01%	0.000
19	2.78	0.00%	0.000
20	2.78	0.00%	0.000
2008, BWC	Totals:	99.50%	1.114

Weibull Calculations:

Wind speed probability is calculated as a Weibull curve defined by the average wind speed and a shape factor, K. To facilitate piece-wise integration, the wind speed range is broken down into "bins" of 1 m/s in width (Column 1). For each wind speed bin, instantaneous wind turbine power (W, Column 2)) is multiplied by the Weibull wind speed probability (f, Column 3). This cross product (Net W, Column 4) is the contribution to average turbine power output contributed by wind speeds in that bin. The sum of these contributions is the average power output of the turbine on a continuous, 24 hour, basis. Best results are achieved using annual or monthly average wind speeds. Use of daily or hourly average speeds is not recommended.

WindCad Turbine Performance Model

Endurance S-343 Wind Turbine, Grid - Intertie

Prepared For: **Bristol, CT**
Site Location: **Bristol, CT**
Data Source: **NASA Atmospheric Science Data Center**
Date: **11/8/2010**

5 kW

Inputs:

Ave. Wind (m/s) = 4.63
Weibull K = 2
Site Altitude (m) = 0
Wind Shear Exp. = 0.180
Anem. Height (m) = 30
Tower Height (m) = 30
Turbulence Factor = 8.0%

Results:

Hub Average Wind Speed (m/s) = 4.63
Air Density Factor = 0%
Average Output Power (kW) = 0.83
Daily Energy Output (kWh) = 19.9
Annual Energy Output (kWh) = **7,249**
Monthly Energy Output = 604
Percent Operating Time = 63.6%

Weibull Performance Calculations

Wind Speed Bin (m/s)	Power (kW)	Wind Probability (f)	Net kW @ V
1	0.00	7.12%	0.000
2	0.00	12.75%	0.000
3	0.00	15.90%	0.000
4	0.00	16.37%	0.000
5	0.49	14.67%	0.072
6	1.10	11.72%	0.129
7	2.02	8.46%	0.171
8	3.00	5.56%	0.167
9	3.81	3.33%	0.127
10	4.41	1.84%	0.081
11	4.80	0.93%	0.045
12	4.99	0.43%	0.022
13	4.90	0.19%	0.009
14	4.53	0.07%	0.003
15	4.00	0.03%	0.001
16	3.52	0.01%	0.000
17	3.19	0.00%	0.000
18	2.78	0.00%	0.000
19	2.78	0.00%	0.000
20	2.78	0.00%	0.000
2008, BWC	Totals:	99.38%	0.828

Weibull Calculations:

Wind speed probability is calculated as a Weibull curve defined by the average wind speed and a shape factor, K. To facilitate piece-wise integration, the wind speed range is broken down into "bins" of 1 m/s in width (Column 1). For each wind speed bin, instantaneous wind turbine power (W, Column 2)) is multiplied by the Weibull wind speed probability (f, Column 3). This cross product (Net W, Column 4) is the contribution to average turbine power output contributed by wind speeds in that bin. The sum of these contributions is the average power output of the turbine on a continuous, 24 hour, basis. Best results are achieved using annual or monthly average wind speeds. Use of daily or hourly average speeds is not recommended.

CLEAN ENERGY... JUST PLUG IT IN

Endurance[®]
wind power

S-343

S-343 5 kW model

- 1 Fiberglass blades
- 2 Rotor Hub
- 3 Dual fail safe calipers
- 4 16" brake disk
- 5 Main shaft bearings
- 6 Induction generator
- 7 Gearbox
- 8 Tower
- 9 Slipring
- 10 Turntable yaw bearing
- 11 Anemometer
- 12 Fiberglass nacelle cover and nose cone

ENDURANCE WIND TURBINES GREEN ENERGY THAT WORKS

TURBINE

Configuration	3 blades, horizontal axis, upwind
Rated power @ 11 m/s	5.3 kW
Applications	Direct grid-tied
Rotor speed	166 rpm
Cut-in wind speed	3.0 m/s (6.7 mph)
Cut-out wind speed	24 m/s (54 mph)
Survival wind speed	53 m/s (119 mph)
Design lifetime	30 years *
Overall weight	272 kg (600 lbs)

ROTOR

Rotor diameter	6.04 m (21 ft)
Swept area	31.9 m ² (343 ft ²)
Blade length	3.2 m (10.5 ft)
Blade material	Fiberglass / Epoxy
Power regulation	Stall control (constant speed)

GENERATOR

Frequency	60 Hz
Voltage	120-240 VAC
Phase	Single phase
Type	Induction generator

BRAKE & SAFETY SYSTEMS

Main brake system	Rapid fail-safe dual redundant brakes on rotor shaft
Secondary safety system	Redundant back-up brake on rotor shaft
Automatic shut down triggered by :	- Over speed - High wind speed - Grid failure - All other fault conditions

CONTROLS

PLC based	Includes remote monitoring software

WARRANTY

Turbine, controls	5 years

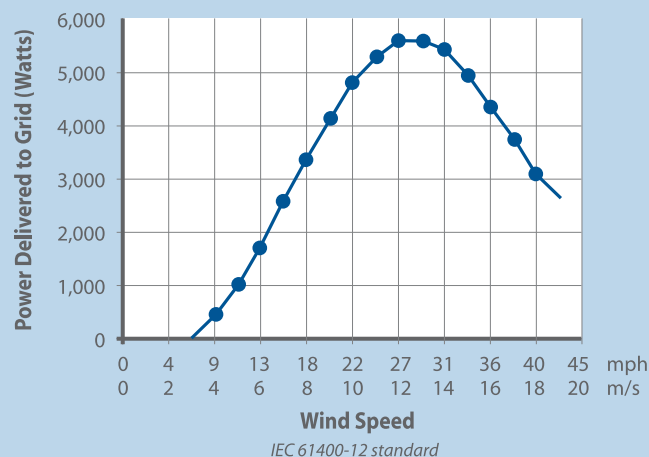
TOWERS

Types and heights	Tubular guyed 19.2 m (63 ft); 25.6 m (84 ft); 32 m (105 ft) and 36.6 m (120 ft) Standard Monopole 30.5 m (100 ft)
Maintenance Access	All are tiltable towers

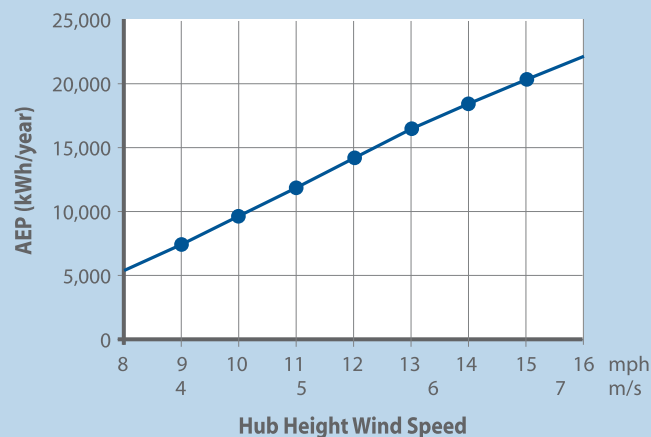
*Provided service and maintenance schedules are strictly followed



POWER CURVE



ANNUAL ENERGY PRODUCTION (AEP)



WIND SPEED CONVERSION TABLE

m/s	4	5	6	7	8	9	10	12	14	25	32	45
km/h	14	18	22	25	29	32	36	43	50	90	125	160
mph	9	11	13	16	18	20	22	27	31	56	80	100

Bristol, CT
5KW (Minimum Average Site Wind Speed – 4.22 m/s)

Annual kWh 5,437
Engineer's Opinion of Probable Cost \$71,995.00

Assumptions
Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs \$0.02/kWh Production
REC Factor \$25/MWh Production
REIP Incentive \$3.20/kWh First 16,000 kWh
\$0.50/kWh 16,000 kWh - 750,000 kWh

Year	Utility Price	Annual Wind kWh Production	Utility Savings	Renewable Energy Credits (RECs)	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow
1	0.2910	5,437.0	\$1,582.17	\$136	(\$109)	\$1,609.4	\$1,609.4
2	0.2997	5,409.8	\$1,621.48	\$135	(\$108)	\$1,648.5	\$3,257.9
3	0.3087	5,382.8	\$1,661.78	\$135	(\$108)	\$1,688.7	\$4,946.6
4	0.3180	5,355.9	\$1,703.07	\$134	(\$107)	\$1,729.9	\$6,676.4
5	0.3275	5,329.1	\$1,745.39	\$133	(\$107)	\$1,772.0	\$8,448.5
6	0.3373	5,302.4	\$1,788.77	\$133	(\$106)	\$1,815.3	\$10,263.7
7	0.3475	5,275.9	\$1,833.22	\$132	(\$106)	\$1,859.6	\$12,123.3
8	0.3579	5,249.5	\$1,878.77	\$131	(\$105)	\$1,905.0	\$14,028.4
9	0.3686	5,223.3	\$1,925.46	\$131	(\$104)	\$1,951.6	\$15,979.9
10	0.3797	5,197.2	\$1,973.31	\$130	(\$104)	\$1,999.3	\$17,979.2
11	0.3911	5,171.2	\$2,022.35	\$129	(\$103)	\$2,048.2	\$20,027.4
12	0.4028	5,145.3	\$2,072.60	\$129	(\$103)	\$2,098.3	\$22,125.8
13	0.4149	5,119.6	\$2,124.11	\$128	(\$102)	\$2,149.7	\$24,275.5
14	0.4273	5,094.0	\$2,176.89	\$127	(\$102)	\$2,202.4	\$26,477.8
15	0.4402	5,068.5	\$2,230.98	\$127	(\$101)	\$2,256.3	\$28,734.2
16	0.4534	5,043.2	\$2,286.42	\$126	(\$101)	\$2,311.6	\$31,045.8
17	0.4670	5,018.0	\$2,343.24	\$125	(\$100)	\$2,368.3	\$33,414.1
18	0.4810	4,992.9	\$2,401.47	\$125	(\$100)	\$2,426.4	\$35,840.6
19	0.4954	4,967.9	\$2,461.15	\$124	(\$99)	\$2,486.0	\$38,326.6
20	0.5103	4,943.1	\$2,522.31	\$124	(\$99)	\$2,547.0	\$40,873.6
21	0.5256	4,918.4	\$2,584.99	\$123	(\$98)	\$2,609.6	\$43,483.2
22	0.5413	4,893.8	\$2,649.22	\$122	(\$98)	\$2,673.7	\$46,156.9
23	0.5576	4,869.3	\$2,715.06	\$122	(\$97)	\$2,739.4	\$48,896.3
24	0.5743	4,845.0	\$2,782.53	\$121	(\$97)	\$2,806.8	\$51,703.0
25	0.5915	4,820.7	\$2,851.67	\$121	(\$96)	\$2,875.8	\$54,578.8

Bristol, CT
5KW (Maximum Average Site Wind Speed - 5.17 m/s)

Annual kWh 9,756
Engineer's Opinion of Probable Cost \$71,995.00

Assumptions
Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs \$0.02/kWh Production
REC Factor \$25/MWh Production
REIP Incentive \$3.20/kWh First 16,000 kWh
\$0.50/kWh 16,000 kWh - 750,000 kWh

Year	Utility Price	Annual Wind kWh Production	Utility Savings	Renewable Energy Credits (RECs)	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow
1	0.2910	9,756.0	\$2,839.00	\$244	(\$195)	\$2,887.8	\$2,887.8
2	0.2997	9,707.2	\$2,909.55	\$243	(\$194)	\$2,958.1	\$5,845.9
3	0.3087	9,658.7	\$2,981.85	\$241	(\$193)	\$3,030.1	\$8,876.0
4	0.3180	9,610.4	\$3,055.95	\$240	(\$192)	\$3,104.0	\$11,980.0
5	0.3275	9,562.3	\$3,131.89	\$239	(\$191)	\$3,179.7	\$15,159.7
6	0.3373	9,514.5	\$3,209.71	\$238	(\$190)	\$3,257.3	\$18,417.0
7	0.3475	9,467.0	\$3,289.48	\$237	(\$189)	\$3,336.8	\$21,753.8
8	0.3579	9,419.6	\$3,371.22	\$235	(\$188)	\$3,418.3	\$25,172.1
9	0.3686	9,372.5	\$3,454.99	\$234	(\$187)	\$3,501.9	\$28,674.0
10	0.3797	9,325.7	\$3,540.85	\$233	(\$187)	\$3,587.5	\$32,261.4
11	0.3911	9,279.0	\$3,628.84	\$232	(\$186)	\$3,675.2	\$35,936.7
12	0.4028	9,232.6	\$3,719.02	\$231	(\$185)	\$3,765.2	\$39,701.9
13	0.4149	9,186.5	\$3,811.43	\$230	(\$184)	\$3,857.4	\$43,559.2
14	0.4273	9,140.5	\$3,906.15	\$229	(\$183)	\$3,951.9	\$47,511.1
15	0.4402	9,094.8	\$4,003.22	\$227	(\$182)	\$4,048.7	\$51,559.8
16	0.4534	9,049.4	\$4,102.70	\$226	(\$181)	\$4,147.9	\$55,707.7
17	0.4670	9,004.1	\$4,204.65	\$225	(\$180)	\$4,249.7	\$59,957.4
18	0.4810	8,959.1	\$4,309.13	\$224	(\$179)	\$4,353.9	\$64,311.3
19	0.4954	8,914.3	\$4,416.22	\$223	(\$178)	\$4,460.8	\$68,772.1
20	0.5103	8,869.7	\$4,525.96	\$222	(\$177)	\$4,570.3	\$73,342.4
21	0.5256	8,825.4	\$4,638.43	\$221	(\$177)	\$4,682.6	\$78,025.0
22	0.5413	8,781.3	\$4,753.69	\$220	(\$176)	\$4,797.6	\$82,822.6
23	0.5576	8,737.3	\$4,871.82	\$218	(\$175)	\$4,915.5	\$87,738.1
24	0.5743	8,693.7	\$4,992.89	\$217	(\$174)	\$5,036.4	\$92,774.4
25	0.5915	8,650.2	\$5,116.96	\$216	(\$173)	\$5,160.2	\$97,934.6

Bristol, CT
5KW (Average Site Wind Speed - 4.63 m/s)

Annual kWh 7,249
Engineer's Opinion of Probable Cost \$71,995.00

Assumptions
Annual System Degredation 0.50%
Annual Utility Inflation 3.00%
Annual Maintenance Costs \$0.02/kWh Production
REC Factor \$25/MWh Production
REIP Incentive \$3.20/kWh First 16,000 kWh
\$0.50/kWh 16,000 kWh - 750,000 kWh

Year	Utility Price	Annual Wind kWh Production	Utility Savings	Renewable Energy Credits (RECs)	Maintenance Costs	Annual Cash Flow	Cumulative Cash Flow
1	0.2910	7,249.0	\$2,109.46	\$181	(\$145)	\$2,145.7	\$2,145.7
2	0.2997	7,212.8	\$2,161.88	\$180	(\$144)	\$2,197.9	\$4,343.6
3	0.3087	7,176.7	\$2,215.60	\$179	(\$144)	\$2,251.5	\$6,595.1
4	0.3180	7,140.8	\$2,270.66	\$179	(\$143)	\$2,306.4	\$8,901.5
5	0.3275	7,105.1	\$2,327.09	\$178	(\$142)	\$2,362.6	\$11,264.1
6	0.3373	7,069.6	\$2,384.91	\$177	(\$141)	\$2,420.3	\$13,684.4
7	0.3475	7,034.2	\$2,444.18	\$176	(\$141)	\$2,479.3	\$16,163.7
8	0.3579	6,999.1	\$2,504.92	\$175	(\$140)	\$2,539.9	\$18,703.6
9	0.3686	6,964.1	\$2,567.16	\$174	(\$139)	\$2,602.0	\$21,305.6
10	0.3797	6,929.2	\$2,630.96	\$173	(\$139)	\$2,665.6	\$23,971.2
11	0.3911	6,894.6	\$2,696.34	\$172	(\$138)	\$2,730.8	\$26,702.0
12	0.4028	6,860.1	\$2,763.34	\$172	(\$137)	\$2,797.6	\$29,499.7
13	0.4149	6,825.8	\$2,832.01	\$171	(\$137)	\$2,866.1	\$32,365.8
14	0.4273	6,791.7	\$2,902.39	\$170	(\$136)	\$2,936.3	\$35,302.2
15	0.4402	6,757.7	\$2,974.51	\$169	(\$135)	\$3,008.3	\$38,310.4
16	0.4534	6,723.9	\$3,048.43	\$168	(\$134)	\$3,082.0	\$41,392.5
17	0.4670	6,690.3	\$3,124.18	\$167	(\$134)	\$3,157.6	\$44,550.1
18	0.4810	6,656.9	\$3,201.82	\$166	(\$133)	\$3,235.1	\$47,785.2
19	0.4954	6,623.6	\$3,281.38	\$166	(\$132)	\$3,314.5	\$51,099.7
20	0.5103	6,590.5	\$3,362.92	\$165	(\$132)	\$3,395.9	\$54,495.6
21	0.5256	6,557.5	\$3,446.49	\$164	(\$131)	\$3,479.3	\$57,974.9
22	0.5413	6,524.7	\$3,532.14	\$163	(\$130)	\$3,564.8	\$61,539.6
23	0.5576	6,492.1	\$3,619.91	\$162	(\$130)	\$3,652.4	\$65,192.0
24	0.5743	6,459.6	\$3,709.87	\$161	(\$129)	\$3,742.2	\$68,934.2
25	0.5915	6,427.4	\$3,802.06	\$161	(\$129)	\$3,834.2	\$72,768.4

APPENDIX K

CL&P Incentive Worksheets

2010 EXPRESS SERVICE: Lighting Rebate Application - CL&P & UI (Effective January 1, 2010)For Commercial/Industrial Accounts Only - **NO NEW CONSTRUCTION**

EMS6607-1 REV. 11-09

PLEASE READ REQUIREMENTS THAT ARE PART OF THIS FORM. ALL INFORMATION IS REQUIRED FOR PROCESSING REBATE.

COMPANY NAME			ELECTRIC ACCOUNT NO.		
FACILITY ADDRESS	CITY	STATE	ZIP CODE	REBATE PAYMENT METHOD (PLEASE INDICATE): ☐ CHECK ☐ CREDIT TO ACCOUNT	
CONTACT PERSON	TITLE			TELEPHONE NO.	
FEDERAL TAX ID	OR	SOCIAL SECURITY NO.		IS YOUR COMPANY A CORPORATION, NON-PROFIT ORGANIZATION OR A STATE/MUNICIPAL GOV'T ENTITY? ☐ YES ☐ NO	
Circle Facility Type For This Project					
OF - OFFICE		RS - RESTAURANT		RT - RETAIL	
UN - UNIVERSITY		HF - HEALTH FACILITY		GR - GROCERY	
		HO - HOTEL/MOTEL		WH - WAREHOUSE	
				ES - ELEMENTARY OR HIGH SCHOOL	
				IM - INDUSTRIAL/MFG.	
				MF - MULTI-FAMILY	
				MC - MISC. COMMERCIAL	
MAILING ADDRESS IF DIFFERENT FROM ABOVE			CITY	STATE	ZIP CODE

FIXTURES & RETROFITS:

Existing Case				New or Final Case					
Quantity	Description of Fixture (or Fixture Code)	Watts/Fixture	Hours of Use (Annual)	Retrofit (R) or New (N)	Quantity	Description of Fixture (or Fixture Code)	Watts/Fixture	Unit Incentive	REBATE (For Group)

BALLASTS	NO. OF BALLASTS REMOVED		NO. OF BALLASTS INSTALLED	\$30.00/ Ballast	REBATE
ELECTRONIC, AUTOMATIC CONTROLLABLE				\$30.00	

OCCUPANCY SENSORS					
NUMBER OF SENSORS	NO. OF WATTS CONTROLLED PER SENSOR		NO. OF FIXTURES CONTROLLED	\$20.00/FIXTURE CONTROLLED	REBATE
				\$20.00	

TOTAL REBATE:**Customer Certification Agreement****(PLEASE READ CAREFULLY)**

I certify that I have purchased and installed the indicated energy-saving products on or after January 1, 2010 for use in the business facility listed above and not for resale. I have attached the itemized proof of purchase (sales slip or invoice, including model numbers of lamps, etc.). I agree to a verification by a Utility representative of both the sales transaction and product installation and also allow Utility access to pre- and post-monitor the installation. Falsifying any of the above information will void this rebate application and any future rebate applications. I agree that to qualify for 100% of the rebate or account credit, I must be receiving a substantial amount of electricity needed by the facility where the lighting equipment is installed, via Utilities' distribution equipment, otherwise the incentive will be prorated by multiplying the full incentive by the percentage of the facility's total electrical needs that is delivered via Utilities' distribution equipment. Utility shall mean CL&P or UI only.

CUSTOMER SIGNATURE REQUIRED			DATE		INSTALLATION DATE
CONTRACTOR NAME		CT E-1 LICENSE NUMBER		INSURANCE CARRIER NAME	
For all installations, the installer must be a licensed electrical contractor/installer and carry liability insurance.					
- FOR CL&P or UI USE ONLY -					
PRE-INSTALL INSPECTION		DATE		POST-INSTALL INSPECTION	
MATERIAL		LABOR		ADM	
				STAFF	
				INVOICE NO.	
				REBATE NO.	

Pre- and post-Inspection of facility required for rebates over \$1,000.

UPGRADE REFERENCE AND WORKSHEET

NOTE: ALL DATA FOR THE PROJECT MUST BE TRANSFERRED TO THE FIRST PAGE OF THE REBATE APPLICATION PRIOR TO SUBMISSION

NOTE: WATTAGES LISTED FOR CONSUMPTION ARE REPRESENTATIVE ONLY. Customer to provide actual wattages on form.

Code	Lighting Contractor Upgrade Description	Fixtures and Retrofits	Old Individual Fixture Wattage	New Individual Fixture Wattage	Type of Lamp Removed: I - MH - F	No. of New or Retrofit Fixtures Installed	X	Rebate per Fixture	EQ	Total Fixture Rebate
2T121	2'T12 1-lamp to 2' T8 1-lamp with EB	T-8 Fluorescent System, Electronic ballast - 1 or 2 lamp conversion	45	20	F			\$10.00		
2T122	2'T12 2-lamp to 2' T8 2-lamp with EB	T-8 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	65	34	F			\$10.00		
2T123	2'T12 3-lamp to 2' T8 3-lamp with EB	T-8 Fluorescent System, Electronic ballast - 3 or 4 lamp conversion	90	52	F			\$15.00		
2T124	2'T12 4-lamp to 2' T8 4-lamp with EB	T-8 Fluorescent System, Electronic ballast - 3 or 4 lamp conversion	130	63	F			\$15.00		
4T121	4'T12 1-lamp to 4' T8 1-lamp with EB	T-8 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	50	25-32	F			\$10.00		
4T122	4'T12 2-lamp to 4' T8 2-lamp with EB	T-8 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	92	47-78	F			\$10.00		
4T12U2R	4'T12U 2-lamp to 2' T8 2-lamp with EB + refl	T-8 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	92	34	F			\$25.00		
4T123	4'T12 3-lamp to 4' T8 3-lamp with EB	T-8 Fluorescent System, Electronic ballast - 3 or 4 lamp conversion	142	70-119	F			\$15.00		
4T124	4'T12 4-lamp to 4' T8 4-lamp with EB	T-8 Fluorescent System, Electronic ballast - 3 or 4 lamp conversion	172	84-148	F			\$15.00		
4T122R	4'T12 2-lamp to 4' T8 1-lamp with EB + refl	T-8 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	92	25-32	F			\$25.00		
4T12HO2R	4'T12HO 2-lamp to 4' T8 2-lamp with EB + refl	T-8 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	131	47-78	F			\$35.00		
4T123R	4'T12 3-lamp to 4' T8 2-lamp with EB + refl	T-8 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	142	47-78	F			\$25.00		
4T124R	4'T12 4-lamp to 4' T8 2-lamp with EB + refl	T-8 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	172	47-78	F			\$35.00		
8T121	8'T12 1-lamp to 4' T8 2-lamp with EB	T-8 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	92	47-78	F			\$10.00		
8T121R	8'T12 1-lamp to 4' T8 2-lamp with EB + refl	T-8 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	92	47-78	F			\$10.00		
8T122	8'T12 2-lamp to 4' T8 2-lamp with EB	T-8 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	131	47-78	F			\$10.00		
8T122R	8'T12 2-lamp to 4' T8 2-lamp with EB + refl	T-8 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	131	47-78	F			\$30.00		
8T1223R	8'T12 2-lamp to 4' T8 3-lamp with EB + refl	T-8 Fluorescent System, Electronic ballast - 3 or 4 lamp conversion	131	70-119	F			\$30.00		
8T1224	8'T12 2-lamp to 4' T8 4-lamp with EB or 8'T8 2-lamp with EB	T-8 Fluorescent System, Electronic ballast - 3 or 4 lamp conversion	131	84-148	F			\$15.00		
8T1224R	8'T12 2-lamp to 4' T8 4-lamp with EB + refl	T-8 Fluorescent System, Electronic ballast - 3 or 4 lamp conversion	131	84-148	F			\$15.00		
8T12HO2	8'T12HO 2-lamp to 4' T8 4-lamp with EB	T-8 Fluorescent System, Electronic ballast - 3 or 4 lamp conversion	240	84-148	F			\$20.00		
8T12HO2R	8'T12HO 2-lamp to 4' T8 4-lamp with EB + refl	T-8 Fluorescent System, Electronic ballast - 3 or 4 lamp conversion	240	84-148	F			\$50.00		
8T12VHO2R	8'T12VHO 2-lamp to 4' T8 6-lamp with EB + refl	T-8 Fluorescent System, Electronic ballast - 6 lamp conversion	310	130-190	F			\$50.00		
8T12HO2R	8'T12HO 2-lamp to 8' T8 2-lamp with EB + refl	T-8 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	240	110	F			\$50.00		

Note 1 The new input wattage calculations are based on T8 lamps powered by a Programmed Rapid Start or Instant Start High-Performance Electronic Ballast with a Low, Normal or High Ballast Efficiency Factor.

Note 2 Disposal of ballasts: The customer is responsible for disposal of all discarded ballasts according to local, state and federal guidelines.

Note 3 Disposal of lamps: The customer is responsible for disposal of all discarded lamps according to local, state and federal guidelines.

UPGRADE REFERENCE AND WORKSHEET

NOTE: ALL DATA FOR THE PROJECT MUST BE TRANSFERRED TO THE FIRST PAGE OF THE REBATE APPLICATION PRIOR TO SUBMISSION

Code	Lighting Contractor Upgrade Description	Fixtures and Retrofits	Old Individual Fixture Wattage	New Individual Fixture Wattage	Type of Lamp Removed: I - MH - F	No. of New or Retrofit Fixtures Installed	X	Rebate per Fixture	EQ	Total Fixture Rebate
4T5HO2R	250 watt MH to 54T5HO 2-lamp fixture	T-5 Fluorescent System, Electronic ballast - 1or 2 lamp conversion	295	117	MH			\$50.00		
4T5HO32R	250 watt MH to 54T5HO 3-lamp fixture	T-5 Fluorescent System, Electronic ballast - 3 or 4 lamp conversion	295	176	MH			\$50.00		
8T12250MHR	250 watt MH to T8 Fluorescent 3-4 lamp fixture with EB & reflector	T-8 Fluorescent System, Electronic ballast - 3 or 4 lamp conversion	295	varies	MH			\$50.00		
4T5HO42R	400 watt MH to 54T5HO 4-lamp fixture	T-5 Fluorescent System, Electronic ballast - 3 or 4 lamp conversion	458	234	MH			\$50.00		
8T12400MHR	400 watt MH to T8 Fluorescent 3-4 lamp fixture with EB & reflector	T-8 Fluorescent System, Electronic ballast - 3 or 4 lamp conversion	458	varies	MH			\$50.00		
NEWT8FIX	Install new T8 fluorescent fixture, 1-4 lamps	New T-8 Fluorescent System, Electronic ballast - 1,2,3 or 4 lamp	varies	varies	F			\$30.00		
NEWT8FIXHPL	All T12 to T8 upgrades and where the new or retrofit fixtures contain only High Performance or Reduced Wattage Lamps and Ballasts . Specifications for these systems appear on the CEE Web site	HPT8 or Reduced Wattage: Additional incentive per fixture	varies	varies	F			\$5.00		
NEWT5FIX	Install new T5 fluorescent fixture, 1-4 lamps	New T-5 Fluorescent System, Electronic ballast - 1,2,3 or 4 lamp	varies	varies	F			\$30.00		
NEWT5HOFIX	Install new HO T5 fluorescent fixture, 2-4 lamps (Not standard linear T5 fixtures)	New HO T-5 Fluorescent System, Electronic ballast - 2,3 or 4 lamp	varies	varies	MH			\$30.00		
NEWT5BIFIX	Install new Biax T5 fluorescent fixture, 2-4 lamps (Not standard linear T5 fixtures)	New Biax T-5 Fluorescent System, Electronic ballast - 2,3 or 4 lamp	varies	varies	varies			\$50.00		
INCCFLR	Retrofit Incandscnt system to Circline or Compact fluorescent system	Compact Fluorescent Hard-Wired System	varies	varies	I			\$25.00		
OCCSEN	Occupancy sensors, wall or ceiling mounted controlling hard-wired fixtures - a minimum of 100 watts per sensor.	Fixtures controlled by occupancy sensors - Per Fixture Controlled	varies	varies	N/A			\$20.00		
OCCSENFIX	Occupancy sensors installed in individual high bay fixtures and controlling a minimum of 100 fixture watts	Individual high bay fixtures controlled by occupancy sensors	varies	varies	N/A			\$30.00		
DIMBAL	New dimmable ballast (Daylight dimming with photocell control)	Electronic automatic controllable ballast	N/A	N/A	N/A			\$30.00		
DIMBALCF	New compact fluorescent fixture with dimmable ballast (Daylight dimming with photocell control)	Compact Fluorescent System, Hard-wired or Circline with dimmable ballast - Per Fixture	N/A	N/A	N/A			\$40.00		
MHPS	Replace metal halide, mercury vapor or high pressure sodium fixtures with pulse start metal halide fixtures New or Retrofit - minimum 50 watts lamp reduction	MH, MV or HPS to PS MH	varies	varies	varies			\$30.00		
EXITLTS	Retrofit or replace existing incandescent or compact fluorescent exit signs with LED signs	Incandescent or CF exit signs to LED exit signs	25	2	I or CFL			\$10.00		

Note 1 Listed old and new fixture wattages are suggested or default values. Actual values should be entered in the (watts/fixture) columns on front page.

Note 2 When using occupancy sensors, Programmed Rapid Start ballasts are recommended to ensure rated lamp life.

Note 3 Refer to CEE website for listing of HPT8 and Reduced Wattage qualified specs and products.

Note 4 Conversions from T8 to HPT8 or Reduced Wattage T8 systems must include lamp and ballast replacement.

Note 5 Lamp only replacements do not qualify.

REBATE REQUIREMENTS

APPLICATION OFFER: This rebate program covers products purchased and installed on or after January 1, 2010. Details of this program and rebate levels are subject to change without prior notice. Contact your participating utility representative for the latest program details. Applications must be submitted by December 31, 2010. Availability of funding is not guaranteed. The Utilities reserve the right to cap incentive amounts.

ELIGIBILITY: Rebates are available to commercial and industrial electric service customers of CL&P/UI for existing facilities. New construction is NOT eligible. For major renovations and inspections, contact an authorized CL&P/UI representative. Residential customers may apply for a rebate for common areas of multi-family housing.

PAYMENT: Rebates will be paid by check or credit to the electric account. We reserve the right to apply rebates to unpaid or overdue accounts. Please allow 60 days for the check or account credit. Payments will not be processed if the form is incomplete.

REBATE AMOUNT: In no case will CL&P/UI pay more than 100% of the purchase price shown on the invoice.

PRE-APPROVAL and VERIFICATION: Rebates exceeding \$1,000 must be pre- and post-inspected by an authorized CL&P/UI representative. Additionally, CL&P/UI reserves the right to inspect any installation prior to issuing rebates.

REBATE LEVELS: Rebate levels will be confirmed upon receipt of detailed invoices stating quantities and part numbers, along with post-inspection results where applicable.

TAX LIABILITY: CL&P/UI will not be responsible for any tax liability imposed on the customer as a result of the rebate payments. All customers must supply their federal tax identification number or social security number in order to receive a rebate. We will issue a 1099 to all unincorporated customers receiving rebates in excess of \$600.00.

ENDORSEMENT: CL&P/UI does not endorse any particular manufacturer, product, or system design in promoting the lighting rebate program. The website below provides access to the industry standard spec for the definition of "High Performance" T-8 lighting systems and Reduced Wattage T-8 lighting systems as well as frequently updated listing of eligible lamp/ballast combinations by manufacturer: <http://www.cce1.org>

ISO-NE CAPACITY PAYMENTS: By signing this document and as a condition to receiving a rebate pursuant to this program, customer hereby assigns to its participating electric utility, either CL&P or UI (as the case may be), any and all payments, benefits and/or credits in connection with the Forward Capacity Market or any currently existing or successor or replacement markets (including but not limited to any and all "LICAP," "ICAP," transitional credits or other capacity related payments, benefits and/or credits for which customer is eligible) and that are associated with or applicable to customer's participation in the program. Customer agrees to execute any and all documents and/or instruments as requested by UI or CL&P (as the case may be) to evidence such assignment. Forward Capacity Market means the market for procuring capacity pursuant to ISO-NE Tariff, FERC Electric Tariff No. 3, Section III, Market Rule 1, Section 13, any modifications to the Forward Capacity Market, or any successor or replacement market/capacity procurement process.

CLASS III CONSERVATION CREDITS: In accordance with the Department of Public Utility Control's ("DPUCs") June 28, 2006 decision in Docket No. 05-07-19, DPUC Proceeding to Develop a New Distributed Resources Portfolio Standard (Class III), customer is not eligible to receive or retain any Class III conservation credits for this project. Such credits shall be retained by either CL&P or UI (as the case may be) for the benefit of its customers through the CEEF. In the event that the DPUC amends or modifies the allocation of Class III conservation credits as reflected in its June 28, 2006 decision, then the allocation of such credits utilized by UI or CL&P (as the case may be) shall be the allocation in effect (per the applicable DPUC decision) on the date that customer signed this application.

PRODUCT REQUIREMENTS

U.L. LISTING: Items eligible for a rebate must be U.L. listed. Reflectors must be U.L. classified.

WATTAGE REDUCTION: There must be at least a 10% system wattage reduction between the old and new system wattage for product to qualify.

INDOOR APPLICATIONS ONLY: All rebate products must be installed in indoor applications only. The exception will be covered parking garages (inside structure fixtures only).

FIXTURES: Conversions to T-8 systems can either be total fixture replacements or simply a lamp and ballast replacement. Conversions from T-8 to High Performance T-8 or Low Wattage T-8 systems must include lamp and ballast replacement to be rebatable. Lamp only replacements do NOT qualify. Contact your CL&P/UI customer support office for details. Conversions to T-5 systems require a total fixture replacement. The customer has the final responsibility for assuring that the fixture conversion or installation is suitable for his lighting requirements.

ELECTRONIC BALLASTS: Compatible electronic ballasts are required as part of retrofitting fluorescent fixtures and must be indicated on the invoice to receive a fixture rebate (T-12 electronic ballasts are not eligible for rebate). Only dimmable electronic (automatic controlled) ballast have a separate rebate. Visit CEE website referenced above to identify currently qualified products.

REFLECTORS: It is recommended that a sample area of reflectors be installed to ensure satisfaction with light output and distribution. Lamps must be re-centered after original lamps are removed; the reflector must cover the full face of the fixture. The reflector must have the appropriate U.L. Classification Marking. These devices have been evaluated by U.L. to determine that when used in accordance with the manufacturer's instructions, they do not adversely affect the operation of the complete fixture. Installation of the retrofit devices must be approved by the local Building Official to ensure compliance with the State Building Code. All reflector projects must be inspected. White or specular metal reflectors must have a minimum reflectivity rating of 90%. White reflectors will only receive an incentive at fixture mounting heights of 12 feet or less.

OCCUPANCY SENSORS: All occupancy sensors must be hard-wired. Each sensor must control a minimum of 100 watts to qualify.

Please return completed application to appropriate location:

CL&P Customers:

Connecticut Light & Power
Conservation & Load Management
P.O. Box 270
Hartford, CT 06141-0270

or

UI Customers:

The United Illuminating Company
Conservation & Load Management
157 Church Street, MS 1-6B
New Haven, CT 06510



**Connecticut
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The Northeast Utilities System



www.CTEnergyInfo.com



The United Illuminating Company

Connecticut's Energy Efficiency Programs are funded by a Charge on Customer energy bills.
The Programs are designed to help customers manage their energy usage and cost.

Paid for by CL&P and UI customers.

C0034 Rev. 11-09

Connecticut Motor Up 2010



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ENERGY EFFICIENCY FUND**

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The United Illuminating Company

The Connecticut Light and Power Company
P.O. Box 270
Hartford, CT 06141-0270
Tel: 877-WISE-USE (877-947-3873)

The United Illuminating Company
157 Church Street, P. O. Box 1564
New Haven, CT 06506
Tel: 877-WISE-USE (877-947-3873)
Fax: 203-499-2800

EMS6607-2 REV. 11-09

CUSTOMER INFORMATION

Company Name:		Contact:	
Address:	City:	State:	Zip:
Mailing Address:	City:	State:	Zip:
Electric Account No.:	☐ CL&P ☐ UI	Phone:	Fax:
Federal ID No.:	Incorporated? ☐ Yes ☐ No ☐ Exempt	E-Mail:	

By signing below, customer agrees to the conditions as stated on the back of this application and to any special requirements.

Customer Signature: _____ Date: _____

CONTRACTOR INFORMATION

Company Name:		Contact:	
Address:	State:	Zip:	
Federal ID No.:	Phone:	Fax:	E-Mail:

By signing below, contractor agrees to the conditions as stated on the back of this application and to any special requirements.

Contractor Signature: _____ Date: _____

APPLICATION INSTRUCTIONS

- Read Initiative Requirements on the reverse side of this application.
- Fill out all applicable spaces on this application.
- Customer and contractor sign the application.
- Attach invoice and manufacturer's specification sheet with equipment make, model, size and efficiency rating.
- Send all documentation to your utility. See address above.

PAYMENT METHOD

☐ Account Credit

☐ Check to Customer

☐ Check to Contractor

MEASURE INFORMATION

Reason N=New F=Failed S=Stocked	Manufacturer	ODP or TEFC	Model No.	Function (Fan, Pump, Process, Other)	Location (Bldg/Rm)	Size (HP)	Speed (RPM)	NEMA Nominal Efficiency (%)	Annual Run Hours (2000 min)	Rebate Per Motor (See Table)	Qty	Requested Rebate
Example F	Acme	TEFC	RR/C157	HVAC Pump	Mech. Rm #4	30	1800	93.6	4400	\$150	1	\$150

Total Rebate: \$

For Motor Up Administrative Use Only:

Project Id:	Database Id:	Approved Rebate: \$	Approving Program Manager:
Required Inspections:	Pre-Inspection Date:	Inspector:	
	Post-Inspection Date:	Inspector:	
Approvals:	Pre-Approval Date:	Program Manager:	Pre-Approved Rebate: \$
	Final Approval Date:	Program Manager:	Final Rebate: \$

ELIGIBILITY REQUIREMENTS

Rebates will be provided for the installation of new premium-efficiency, three-phase 1-200 HP open drip proof (ODP) or totally enclosed fan cooled (TEFC) 1200, 1800 or 3600 RPM motors. All other applications must be submitted as custom measures.

Motors must operate a minimum of 2000 hours annually.

PREMIUM-EFFICIENCY MOTOR REBATES – OPEN DRIP-PROOF

NEMA NOMINAL EFFICIENCY

Size (HP)	1	1.5	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	200
1200 RPM	82.5%	86.5%	87.5%	88.5%	89.5%	90.2%	91.7%	91.7%	92.4%	93.0%	93.6%	94.1%	94.1%	94.5%	94.5%	95.0%	95.0%	95.4%	95.4%
1800 RPM	85.5%	86.5%	86.5%	89.5%	89.5%	91.0%	91.7%	93.0%	93.0%	93.6%	94.1%	94.1%	94.5%	95.0%	95.0%	95.4%	95.4%	95.8%	95.8%
3600 RPM	77.0%	84.0%	85.5%	85.5%	86.5%	88.5%	89.5%	90.2%	91.0%	91.7%	91.7%	92.4%	93.0%	93.6%	93.6%	93.6%	94.1%	94.1%	95.0%
Rebate	\$45	\$45	\$54	\$54	\$54	\$81	\$90	\$104	\$113	\$117	\$135	\$162	\$198	\$234	\$270	\$360	\$540	\$630	\$630

PREMIUM-EFFICIENCY MOTOR REBATES – TOTALLY ENCLOSED FAN COOLED

NEMA NOMINAL EFFICIENCY

Size (HP)	1	1.5	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	200
1200 RPM	82.5%	87.5%	88.5%	89.5%	89.5%	91.0%	91.0%	91.7%	91.7%	93.0%	93.0%	94.1%	94.1%	94.5%	94.5%	95.0%	95.0%	95.8%	95.8%
1800 RPM	85.5%	86.5%	86.5%	89.5%	89.5%	91.7%	91.7%	92.4%	93.0%	93.6%	93.6%	94.1%	94.5%	95.0%	95.4%	95.4%	95.4%	95.8%	96.2%
3600 RPM	77.0%	84.0%	85.5%	86.5%	88.5%	89.5%	90.2%	91.0%	91.0%	91.7%	91.7%	92.4%	93.0%	93.6%	93.6%	94.1%	95.0%	95.0%	95.4%
Rebate	\$50	\$50	\$60	\$60	\$60	\$90	\$100	\$115	\$125	\$130	\$150	\$180	\$220	\$260	\$300	\$400	\$600	\$700	\$700

TERMS AND CONDITIONS

Application Offer: This Initiative covers products purchased and installed or placed into stock on or after January 1, 2010. Details of this rebate program, including rebate levels, are subject to change or cancellation without prior notice. Contact your utility for the latest program details. This application, with required documentation, must be received by December 31, 2010. Motor project/savings may not be claimed under any other program. The Utilities reserve the right to cap incentive amounts. Call 1-877-WISE-USE for additional initiative details.

Completed and signed applications or a letter of intent must be submitted within 30 days of the equipment installation to be eligible for Rebates.

Eligibility: Rebates are available to industrial, commercial, institutional and agricultural electric services customers. Motors must be installed or stocked in the service territory of the participating utility. Motors covered by this program must be new, three phase, induction motors, NEMA Design A & B, 1 – 200 HP, ODP or TEFC, 1200, 1800, or 3600 RPM. Other motors may be eligible for rebate under other programs. Please contact 1-877-WISE-USE for additional information.

Proof of Purchase: A sales slip itemizing the new equipment purchased must accompany each incentive application form. The proof of purchase must indicate type, size, make, and model number of the motor, as well as the date purchased.

Application Form: This application must be filled out completely, truthfully and accurately. An authorized representative of the customer must sign, date, and submit the application along with an itemized proof of purchase or invoice. The efficiency information provided should be the NEMA nominal-efficiency rating from the motor name-plate. Efficiencies are to be full-load nominal efficiencies tested in accordance with IEEE Standard 112, Test Method B.

Payment: Please allow 30 days for payment or account credit. Payment process may take longer if information is missing on application. Call 1-877-WISE-USE for details.

Assignment: The customer may assign the rebate payment to a qualified contractor.

Approval and Verification: Pre-approval from your electric utility may be required. Your participating electric utility reserves the right to verify sales transactions and to inspect the motor installed or stocked under this program prior to issuing rebates, or at a later time, for monitoring and evaluation purposes.

Tax Liability: Your participating electric utility will not be responsible for any tax liability that may be imposed on the customer as a result of the payment of rebates. All customers must supply their Federal Tax Identification number or Social Security number and a completed and signed W-9 form in order to receive a Rebate.

Endorsement: Your participating electric utility does not endorse any particular manufacturer, product or system design in promoting this program.

Limitation of Liability: YOUR ELECTRIC UTILITY DOES NOT WARRANT THE PERFORMANCE OF INSTALLED EQUIPMENT, EXPRESSLY OR IMPLICITLY. Rotational speed differences between premium and EPACT motors can affect savings or performance. Contact your electrical contractor for details regarding equipment performance and warranties.

The liability of your participating electric utility is limited to paying the Rebate specified. The participating utility is not liable for any consequential or incidental damages or for any damages in tort connected with or resulting from participation in this rebate program.

Specific Requirements: Some utilities have specific requirements or conditions regarding issues such as: motors placed in stock, payment options, and rebate restrictions for facilities using self-generation for non-emergency purposes. Please call 1-877-WISE-USE for additional details.

Owner's Certification: Owner certifies that he/she has purchased and installed the equipment listed above at the defined location. Owner agrees that all information is true and that he/she conformed to all equipment requirements listed. Owner has verified that the motors listed above have been installed correctly.

Forward Capacity Market and Class III Credits. By signing this document and as a condition to receiving a rebate pursuant to this program, customer hereby assigns to its participating electric utility, either CL&P or UI (as the case may be), any and all payments, benefits and/or credits in connection with the Forward Capacity Market or any currently existing or successor or replacement markets, (including, but not limited to, any and all "LICAP", "ICAP", transitional credits or payments or any and all other capacity-related credits, payments and/or benefits for which Customer is eligible) and that are associated with or applicable to customer's participation in the Connecticut Motor Up Incentive Program. Customer hereby assigns to either CL&P or UI (as the case may be) all of its right, title and interest in and to any and all such capacity payments, credits and/or benefits and shall take any and all action, including executing and delivering any and all documents and/or instruments, as requested by either CL&P or UI (as the case may be) to evidence the same. Forward Capacity Market means the market for procuring capacity pursuant to ISO-NE Tariff, FERC Electric Tariff No. 3, Section III, Market Rule 1, Section 13, any modifications to the Forward Capacity Market, or any successor or replacement market/capacity procurement process.

In accordance with the Department of Public Utility Control's ("DPUCs") September 29, 2008 decision in Docket No. 05-07-19RE01, DPUC Proceeding to Develop a New Distributed Resources Portfolio Standard (Class III) – 2007 Revisions, Customer is not eligible to receive or retain any Class III conservation credits in connection with the Connecticut Motor Up Incentive Program and Customer hereby acknowledges and agrees the same. Customer further acknowledges and agrees that such credits shall be retained by either CL&P or UI (as the case may be) for the benefit of their customers through the Connecticut Energy Efficiency Fund. In the event that the DPUC amends or modifies the allocation of Class III conservation credits as reflected in its September 29, 2008 decision, then the allocation of such credits utilized by either CL&P or UI (as the case may be) shall be the allocation in effect (per the applicable DPUC decision) on the date that the Customer submitted its rebate application documents to either CL&P or UI (as the case may be).



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Connecticut's Energy Efficiency Programs are funded by a Charge on Customer energy bills.
The Programs are designed to help customers manage their energy usage and cost.

Comprehensive Project: Q&A

Energy Opportunities (EO) and Small Business Energy Advantage (SBEA) programs' Comprehensive Initiative is designed to increase the depth and breadth of energy efficiency projects being contemplated and implemented by customers. The Initiative includes:

- Financial incentives based upon the lesser of:
 - 50% of installed cost;
 - buy-down of the project to a 2-year payback (based on savings at the customer's meter);
 - avoided energy cost (1 year) – up to \$0.50 per annual kWh and \$700.00 per summer peak kW combined
- “Comprehensive” is defined as projects having at least 2 electric end-uses with at least 15% of the project's energy savings and summer peak demand savings (kWh + kW) resulting from non-lighting end-uses and with no one measure having more than 85% of the project's energy savings and summer peak demand savings (kWh + kW).
- If the project also includes any gas efficiency measures (firm gas customers only), the customer may also receive up to an additional 10% incentive for eligible gas measures.

Note: All projects are subject to a \$300K incentive cap for each meter per year and \$750K per year per Federal Tax ID incentive caps.

The following are answers to some common questions.

Question #1:

What types of projects are eligible for the Comprehensive Initiative?

Answer

Retrofit projects that save electric energy in an existing commercial or industrial facility are eligible to participate in the Comprehensive Initiative. To qualify, a project must have at least two measures that save electric energy in at least two different end uses.

Question #2:

What is an “end use”?

Answer

End uses are categories or classifications used to report energy savings. For the purposes of the Connecticut Energy Efficiency Fund (CEEF) programs, end use categories are lighting, comfort cooling, comfort heating, process, refrigeration, water heating, EMS and other. The end use category of “other” is typically used to classify measures that affect more than one end use, like heating and cooling. A common example of “other” is motors in an air handler with hot water and chilled water coils. EMS is also a measure that typically has energy savings in more than one end use. As such, for Comprehensive Initiative projects, EMS will be classified as its own separate end use.

Question #3:

What types of projects or measures are **NOT** eligible for the Comprehensive Initiative?

Answer

- new construction
- major renovation (replacement of building systems)
- replacement of non-functioning equipment, components or devices (even if the system can function without it.)
- equipment replacements or upgrades that are being made to increase output/throughput or to meet new emissions or discharge requirements
- new roof
- change in occupancy use classification

Question #4:

Are there any minimum efficiency requirements for equipment, components or systems?

Answer

- Package air conditioning equipment must meet the minimum efficiencies identified on the Connecticut Cool Choice rebate application form as posted on the CL&P and UI websites. Call the CEEF utility program administrator for efficiency requirements on larger units.
- Three-phase motors must meet the minimum efficiencies on the CEEF Connecticut Motor Up rebate application form as posted on the CL&P and UI websites. Call the CEEF utility program administrator for efficiency requirements on larger motors.
- Electric Chillers

○ Water-cooled centrifugal		
	Size	IPLV
	(tons)	(kW/ton)
	≤149	0.610
	150 to 299	0.570
	≥300	0.530
○ Water-cooled screw and scroll		
	Size	IPLV
	(tons)	(kW/ton)
	<100	0.640
	100 to 149	0.610
	150 to 199	0.590
	200 to 224	0.570
	225 to 349	0.540
	350 to 524	0.530
	525 to 624	0.520
	≥625	0.510
○ Air-cooled		
	Size	IPLV
	(tons)	(EER)
	<100	12.100
	100 to 110	12.010
	111 to 120	11.910
	121 to 130	11.810
	131 to 140	11.710
	141 to 150	11.610
	151 to 170	11.510
	171 to 180	11.410

181 to 190	11.310
191 to 200	11.210
201 to 210	11.110
211 to 220	11.010
221 to 230	10.910
231 to 240	10.810
241 to 250	10.710
251 to 260	10.610
261 to 270	10.510
271 to 280	10.410
281 to 300	10.310
301 to 310	10.210
311 to 320	10.110
321 to 330	10.010
≥331	9.910

- All other equipment, components or systems must meet the minimum requirements of ASHRAE/IESNA Standard 90.1-2004 with all published addenda.

Note: These values may change for 2010.

Question #5:

How are the installed costs allocated for measures that have electric savings only and measures that have both electric and fossil fuel savings?

Answer

The installed cost for measures with electric savings only will be the installed cost for the measure.

The installed cost for measures with both electric and fossil fuel savings will be based on an allocation of the percentage of the electric savings and the fossil fuel savings. The allocated percentage of the installed cost for a measure that saves both electric and fossil fuel energy is calculated by multiplying the total installed cost of the measure by the billed value of the electric energy savings and dividing by the total billed value of the fossil fuel and electric savings.

Example: A new energy management system (EMS) with an installed cost of \$66,000 is proposed as one measure of a comprehensive project for an electric customer on CL&P's Rate 55. The EMS is estimated to generate savings of 6,500 gallons of oil, 25,000 kWh of on-peak energy and 55,000 kWh of off-peak energy. There is no demand reduction associated with the EMS. The installed cost for the electric portion of the EMS will be calculated in the following manner:

<u>Energy Savings</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Total Billed Savings</u>
Fossil Fuel			
Oil (gallons)	6,500	\$2.50	\$16,250.00
Electric			
On-peak Electric (kWh)	25,000	\$0.01750	\$437.50
Off-peak Electric (kWh)	55,000	\$0.01250	\$687.50
P/T Demand Reduction (kW)	0	\$6.44	-
Dist Demand Reduction (kW)	0	\$4.69	-
On-peak Generation (kWh)	25,000	\$0.14422	\$3,605.50
Off-peak Generation (kWh)	55,000	\$0.11422	\$6,282.10
Total Electric Savings			\$11,012.60

Billed value of energy savings = \$27,262.60 (16,250.00 + 11,012.60)

Electric percentage = 40% (11,012.60/27,262.60)

Oil percentage = 60% (16,250.00/27,262.60)

Allocated installed cost, electric = \$26,660.00 (40% of \$66,000.00)

Therefore, \$26,660 would be the electric portion of the installed cost for the EMS measure that saved both electric and fossil fuel energy. The energy savings used for determining the payback is from the electric savings only.

Question #6:

What will the Comprehensive Initiative incentive be if the payback of the project is less than two years?

Answer

If the project's payback is two years or less, the Comprehensive Initiative incentive will be \$0 and the incentive for the project will be the sum of the normal program incentives for the individual measures calculated in accordance with CEEF program rules.

Question #7:

Can a gas measure be combined with an electric measure to qualify for a Comprehensive Initiative project?

Answer

No, the Comprehensive Initiative is designed around the electric energy savings. To qualify, a project must have a minimum of two electric measures that save electric energy in a minimum of two end uses. No single end uses can be more than 85% of the total project electric energy savings. A measure that saves natural gas (firm gas customers only) may receive up to an additional 10% of the normal program incentives for the individual measures calculated in accordance with CEEF gas program rules.

Question #8:

Can the cost and savings of replacing fossil fuel boilers be included in a comprehensive project?

Answer

No, this is a stand alone fossil fuel measure. All cost and savings for this stand alone measure would not be included in the Comprehensive Initiative evaluation. If the boiler is on a firm gas account, it may qualify for an incentive under the CEEF natural gas programs and up to an additional 10% incentive if submitted with a Comprehensive Initiative project. Should funding become available from ARRA (Federal Stimulus Funding), then other fossil fuels will be handled the same way as firm natural gas measures (i.e. the project may receive up to an additional 10% similar to what the natural gas program offers for individual measures calculated in accordance with CEEF gas program rules.)

Question #9:

When are other fuels used to qualify a Comprehensive Initiative project?

Answer

The installed cost and energy savings of a fossil fuel measure are used to determine the allocated costs of a combined electric/fossil fuel measure. See Question #5 for an example of an energy management system (EMS) measure that has both electric and fossil fuel savings and how to split the cost relative to the estimated billed energy savings.

Question #10:

Will the additional 10% still be added to the natural gas CEEF program incentive if the electric portion of the project qualifies as a comprehensive project but the Comprehensive Initiative incentive is \$0? (As in the case when the payback is less than 2.0 years.)

Answer

Yes, as long as it is supported by the energy savings.

Question #11:

Does a retrofit project in a grocery store have two end uses if it proposes to retrofit the motors in the refrigerated cases with ECM motors and to retrofit the air handlers with VFDs?

Answer

Yes. The motors in the refrigerated cases are considered “refrigeration” and the air handlers are considered “comfort cooling,” “comfort heating,” or “other” (since it may provide both heating and cooling to the space.)

Question #12:

Are operation and maintenance measures included in the Comprehensive Initiative?

Answer

Operations measures and maintenance measures may be considered. Projects that are part of the CEEF Retro Commissioning process are not included in the Comprehensive Initiative.

Question #13:

Can equipment replacement be part of the comprehensive project?

Answer

Like-for-like replacement of functioning equipment is eligible. (See question #4 for the minimum efficiency requirements.)

APPENDIX L

ECRM Financial Analysis

IRR, NPV, AROI - Anoxic Mixing ECRMs

Financial Calculations

Based on inflation of: 3%

Option 1			Option 2		
Hyperbolic Mixer			Pulsed Large Bubble Mixing System		
Year	Energy Savings	Cash Flow	Year	Energy Savings	Cash Flow
0		(\$208,828)	0		(\$366,800)
1	\$19,746	\$23,746	1	\$18,537	\$22,537
2	\$20,338	\$24,338	2	\$19,093	\$23,093
3	\$20,949	\$24,949	3	\$19,666	\$23,666
4	\$21,577	\$25,577	4	\$20,256	\$24,256
5	\$22,224	\$26,224	5	\$20,864	\$24,864
6	\$22,891	\$26,891	6	\$21,489	\$25,489
7	\$23,578	\$27,578	7	\$22,134	\$26,134
8	\$24,285	\$28,285	8	\$22,798	\$26,798
9	\$25,014	\$29,014	9	\$23,482	\$27,482
10	\$25,764	\$29,764	10	\$24,187	\$7,187
11	\$26,537	\$30,537	11	\$24,912	\$28,912
12	\$27,333	\$31,333	12	\$25,660	\$29,660
13	\$28,153	\$32,153	13	\$26,429	\$30,429
14	\$28,998	\$32,998	14	\$27,222	\$31,222
15	\$29,868	\$33,868	15	\$28,039	\$32,039
IRR		9.88%	IRR		0.54%
NPV		\$153,752	NPV		(\$40,501)
AROI		6.37%	AROI		1.14%

1. Option 2 includes the replacement cost of a new compressor at year 10 (\$19,000 + 10% escalation)

Bristol CT WPCF - Anoxic Mixing System ECRMs
Lifetime Savings Analysis

ECRM	Option 1 - New Hyperbolic Mixers	Option 2 - Pulsed Large Bubble Mixing System
Assumed Inflation (Gas)	2%	2%
Initial Yearly Savings (Gas)		
Assumed Inflation (Electricity)	3%	3%
Initial Yearly Savings (Electricity)	\$19,746.00	\$18,537.00
Assumed Average Useful Life (Years)	15	15
Lifetime Savings	\$367,254.15	\$344,768.07
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$19,746.00	\$18,537.00
2	\$20,338.38	\$19,093.11
3	\$20,948.53	\$19,665.90
4	\$21,576.99	\$20,255.88
5	\$22,224.30	\$20,863.56
6	\$22,891.03	\$21,489.46
7	\$23,577.76	\$22,134.15
8	\$24,285.09	\$22,798.17
9	\$25,013.64	\$23,482.12
10	\$25,764.05	\$24,186.58
11	\$26,536.97	\$24,912.18
12	\$27,333.08	\$25,659.54
13	\$28,153.07	\$26,429.33
14	\$28,997.67	\$27,222.21
15	\$29,867.60	\$28,038.88

IRR, NPV, AROI - UV System ECRMs

Financial Calculations

Based on inflation of: 3%

Option 1

Control Upgrade

Year	Energy Savings	Cash Flow
0		(\$147,839)
1	\$9,722	\$9,722
2	\$10,014	\$10,014
3	\$10,314	\$10,314
4	\$10,623	\$10,623
5	\$10,942	\$10,942
6	\$11,270	\$11,270
7	\$11,609	\$11,609
8	\$11,957	\$11,957
9	\$12,316	\$12,316
10	\$12,685	\$12,685
11	\$13,066	\$13,066
12	\$13,458	\$13,458
13	\$13,861	\$13,861
14	\$14,277	\$14,277
15	\$14,705	\$14,705
IRR		2.45%
NPV		\$5,373
AROI		1.58%

Bristol CT WPCF - UV System ECRMs
Lifetime Savings Analysis

ECM	Option 1 - Controls Upgrade
Assumed Inflation (Gas)	2%
Initial Yearly Savings (Gas)	
Assumed Inflation (Electricity)	3%
Initial Yearly Savings (Electricity)	\$9,722.00
Assumed Average Useful Life (Years)	15
Lifetime Savings	\$180,818.64
<u>Year</u>	<u>Annual Savings</u>
1	\$9,722.00
2	\$10,013.66
3	\$10,314.07
4	\$10,623.49
5	\$10,942.20
6	\$11,270.46
7	\$11,608.58
8	\$11,956.83
9	\$12,315.54
10	\$12,685.00
11	\$13,065.56
12	\$13,457.52
13	\$13,861.25
14	\$14,277.08
15	\$14,705.40

IRR, NPV, AROI - Plant Water ECRMs

Financial Calculations

Based on inflation of: 3%

Option 1			Option 2		
New Packaged Plant Water System			Foam Control System		
Year	Energy Savings	Cash Flow	Year	Energy Savings	Cash Flow
0		(\$249,960)	0		(\$9,048)
1	\$14,000	\$15,000	1	\$10,200	\$10,200
2	\$14,420	\$15,420	2	\$10,506	\$10,506
3	\$14,853	\$15,853	3	\$10,821	\$10,821
4	\$15,298	\$16,298	4	\$11,146	\$11,146
5	\$15,757	\$16,757	5	\$11,480	\$11,480
6	\$16,230	\$17,230	6	\$11,825	\$11,825
7	\$16,717	\$17,717	7	\$12,179	\$12,179
8	\$17,218	\$18,218	8	\$12,545	\$12,545
9	\$17,735	\$18,735	9	\$12,921	\$12,921
10	\$18,267	\$19,267	10	\$13,309	\$13,309
11	\$18,815	\$19,815	11	\$13,708	\$13,708
12	\$19,379	\$20,379	12	\$14,119	\$14,119
13	\$19,961	\$20,961	13	\$14,543	\$14,543
14	\$20,559	\$21,559	14	\$14,979	\$14,979
15	\$21,176	\$22,176	15	\$15,428	\$15,428
	IRR	1.16%		IRR	115.73%
	NPV	(\$16,481)		NPV	\$151,697
	AROI	1.00%		AROI	107.73%

Bristol CT WPCF - Plant Water System ECRMs
Lifetime Savings Analysis

ECRM	Option 1 - New Packaged Plant Water System	Option 2 - Foam Control System
Assumed Inflation (Gas)	2%	2%
Initial Yearly Savings (Gas)		
Assumed Inflation (Electricity)	3%	3%
Initial Yearly Savings (Electricity)	\$14,000.00	\$10,200.00
Assumed Average Useful Life (Years)	15	15
Lifetime Savings	\$260,384.79	\$189,708.92
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$14,000.00	\$10,200.00
2	\$14,420.00	\$10,506.00
3	\$14,852.60	\$10,821.18
4	\$15,298.18	\$11,145.82
5	\$15,757.12	\$11,480.19
6	\$16,229.84	\$11,824.60
7	\$16,716.73	\$12,179.33
8	\$17,218.23	\$12,544.71
9	\$17,734.78	\$12,921.05
10	\$18,266.82	\$13,308.69
11	\$18,814.83	\$13,707.95
12	\$19,379.27	\$14,119.19
13	\$19,960.65	\$14,542.76
14	\$20,559.47	\$14,979.04
15	\$21,176.26	\$15,428.42

IRR, NPV, AROI - Hydroelectric System

Financial Calculations

Based on inflation of: 3%

Option 1

Hydroelectric System

Year	Energy Savings	Cash Flow
0		(\$288,816)
1	\$8,092	\$7,392
2	\$8,335	\$7,635
3	\$8,585	\$7,885
4	\$8,842	\$8,142
5	\$9,108	\$8,408
6	\$9,381	\$8,681
7	\$9,662	\$8,962
8	\$9,952	\$9,252
9	\$10,251	\$9,551
10	\$10,558	\$9,858
11	\$10,875	\$10,175
12	\$11,201	\$10,501
13	\$11,537	\$10,837
14	\$11,883	\$11,183
15	\$12,240	\$11,540

IRR -7.50%

NPV (\$170,286)

AROI -2.44%

Bristol CT WPCF - Hydroelectric System
Lifetime Savings Analysis

ECRM	Option 1 - 10 kW Hydroelectric Turbine
Assumed Inflation (Gas)	2%
Initial Yearly Savings (Gas)	
Assumed Inflation (Electricity)	3%
Initial Yearly Savings (Electricity)	\$8,092.00
Assumed Average Useful Life (Years)	15
Lifetime Savings	\$150,502.41
<u>Year</u>	<u>Annual Savings</u>
1	\$8,092.00
2	\$8,334.76
3	\$8,584.80
4	\$8,842.35
5	\$9,107.62
6	\$9,380.85
7	\$9,662.27
8	\$9,952.14
9	\$10,250.70
10	\$10,558.22
11	\$10,874.97
12	\$11,201.22
13	\$11,537.26
14	\$11,883.37
15	\$12,239.88

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of: 3%
O&M inflation: 3%

City Hall					City Hall Annex				
Year	Energy Savings	REC	Maintenance Cost	Cash Flow	Year	Energy Savings	REC	Maintenance Cost	Cash Flow
0				(\$1,178,855)	0				(\$378,125)
1	\$19,085.1	\$2,709	(\$2,167)	\$19,627	1	\$4,928.8	\$650.6	(\$521)	\$5,059
2	\$19,559.4	\$2,695	(\$2,156)	\$20,098	2	\$5,051.3	\$647.4	(\$518)	\$5,181
3	\$20,045.5	\$2,682	(\$2,145)	\$20,582	3	\$5,176.8	\$644.2	(\$515)	\$5,306
4	\$20,543.6	\$2,668	(\$2,135)	\$21,077	4	\$5,305.5	\$640.9	(\$513)	\$5,434
5	\$21,054.1	\$2,655	(\$2,124)	\$21,585	5	\$5,437.3	\$637.7	(\$510)	\$5,565
6	\$21,577.3	\$2,642	(\$2,113)	\$22,106	6	\$5,572.4	\$634.5	(\$508)	\$5,699
7	\$22,113.5	\$2,629	(\$2,103)	\$22,639	7	\$5,710.9	\$631.4	(\$505)	\$5,837
8	\$22,663.0	\$2,615	(\$2,092)	\$23,186	8	\$5,852.8	\$628.2	(\$503)	\$5,978
9	\$23,226.2	\$2,602	(\$2,082)	\$23,747	9	\$5,998.3	\$625.1	(\$500)	\$6,123
10	\$23,803.4	\$2,589	(\$2,072)	\$24,321	10	\$6,147.3	\$621.9	(\$498)	\$6,272
11	\$24,394.9	\$2,576	(\$2,061)	\$24,910	11	\$6,300.1	\$618.8	(\$495)	\$6,424
12	\$25,001.1	\$2,564	(\$2,051)	\$25,514	12	\$6,456.6	\$615.7	(\$493)	\$6,580
13	\$25,622.4	\$2,551	(\$2,041)	\$26,133	13	\$6,617.1	\$612.7	(\$490)	\$6,740
14	\$26,259.1	\$2,538	(\$2,030)	\$26,767	14	\$6,781.5	\$609.6	(\$488)	\$6,903
15	\$26,911.6	\$2,525	(\$2,020)	\$27,417	15	\$6,950.0	\$606.5	(\$485)	\$7,071
16	\$27,580.4	\$2,513	(\$2,010)	\$28,083	16	\$7,122.8	\$603.5	(\$483)	\$7,243
17	\$28,265.7	\$2,500	(\$2,000)	\$28,766	17	\$7,299.8	\$600.5	(\$480)	\$7,420
18	\$28,968.1	\$2,488	(\$1,990)	\$29,466	18	\$7,481.2	\$597.5	(\$478)	\$7,601
19	\$29,688.0	\$2,475	(\$1,980)	\$30,183	19	\$7,667.1	\$594.5	(\$476)	\$7,786
20	\$30,425.7	\$2,463	(\$1,970)	\$30,918	20	\$7,857.6	\$591.5	(\$473)	\$7,976
21	\$31,181.8	\$2,450	(\$1,960)	\$31,672	21	\$8,052.8	\$588.6	(\$471)	\$8,171
22	\$31,956.7	\$2,438	(\$1,951)	\$32,444	22	\$8,253.0	\$585.6	(\$469)	\$8,370
23	\$32,750.8	\$2,426	(\$1,941)	\$33,236	23	\$8,458.0	\$582.7	(\$466)	\$8,575
24	\$33,564.7	\$2,414	(\$1,931)	\$34,047	24	\$8,668.2	\$579.8	(\$464)	\$8,784
25	\$34,398.8	\$2,402	(\$1,921)	\$34,879	25	\$8,883.6	\$576.9	(\$462)	\$8,999
IRR #NUM! NPV (\$733,423.55) AROI -2.34%					IRR N/A NPV (\$263,252.10) AROI -2.66%				

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of: 3%
O&M inflation: 3%

Engine 2					Engine 3				
Year	Energy Savings	REC	Maintenance Cost	Cash Flow	Year	Energy Savings	REC	Maintenance Cost	Cash Flow
0				(\$383,255)	0				(\$307,070)
1	\$5,057.2	\$664	(\$531)	\$5,190	1	\$3,783.6	\$468	(\$374)	\$3,877
2	\$5,182.8	\$661	(\$528)	\$5,315	2	\$3,877.6	\$466	(\$373)	\$3,971
3	\$5,311.6	\$657	(\$526)	\$5,443	3	\$3,974.0	\$463	(\$371)	\$4,067
4	\$5,443.6	\$654	(\$523)	\$5,574	4	\$4,072.7	\$461	(\$369)	\$4,165
5	\$5,578.9	\$651	(\$521)	\$5,709	5	\$4,173.9	\$459	(\$367)	\$4,266
6	\$5,717.5	\$647	(\$518)	\$5,847	6	\$4,277.7	\$456	(\$365)	\$4,369
7	\$5,859.6	\$644	(\$515)	\$5,988	7	\$4,384.0	\$454	(\$363)	\$4,475
8	\$6,005.2	\$641	(\$513)	\$6,133	8	\$4,492.9	\$452	(\$361)	\$4,583
9	\$6,154.5	\$638	(\$510)	\$6,282	9	\$4,604.5	\$450	(\$360)	\$4,694
10	\$6,307.4	\$635	(\$508)	\$6,434	10	\$4,719.0	\$447	(\$358)	\$4,808
11	\$6,464.1	\$631	(\$505)	\$6,590	11	\$4,836.2	\$445	(\$356)	\$4,925
12	\$6,624.8	\$628	(\$503)	\$6,750	12	\$4,956.4	\$443	(\$354)	\$5,045
13	\$6,789.4	\$625	(\$500)	\$6,914	13	\$5,079.6	\$441	(\$353)	\$5,168
14	\$6,958.1	\$622	(\$498)	\$7,082	14	\$5,205.8	\$438	(\$351)	\$5,294
15	\$7,131.0	\$619	(\$495)	\$7,255	15	\$5,335.2	\$436	(\$349)	\$5,422
16	\$7,308.2	\$616	(\$493)	\$7,431	16	\$5,467.8	\$434	(\$347)	\$5,555
17	\$7,489.8	\$613	(\$490)	\$7,612	17	\$5,603.6	\$432	(\$346)	\$5,690
18	\$7,676.0	\$610	(\$488)	\$7,798	18	\$5,742.9	\$430	(\$344)	\$5,829
19	\$7,866.7	\$607	(\$485)	\$7,988	19	\$5,885.6	\$428	(\$342)	\$5,971
20	\$8,062.2	\$604	(\$483)	\$8,183	20	\$6,031.8	\$425	(\$340)	\$6,117
21	\$8,262.5	\$601	(\$480)	\$8,383	21	\$6,181.7	\$423	(\$339)	\$6,266
22	\$8,467.9	\$598	(\$478)	\$8,587	22	\$6,335.4	\$421	(\$337)	\$6,420
23	\$8,678.3	\$595	(\$476)	\$8,797	23	\$6,492.8	\$419	(\$335)	\$6,577
24	\$8,893.9	\$592	(\$473)	\$9,012	24	\$6,654.1	\$417	(\$334)	\$6,738
25	\$9,115.0	\$589	(\$471)	\$9,233	25	\$6,819.5	\$415	(\$332)	\$6,902
			IRR	#NUM!				IRR	N/A
			NPV	(\$265,403.37)				NPV	(\$218,992.24)
			AROI	-2.65%				AROI	-2.74%

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of: 3%
O&M inflation: 3%

Animal Control					City Yard				
Year	Energy Savings	REC	Maintenance Cost	Cash Flow	Year	Energy Savings	REC	Maintenance Cost	Cash Flow
0				(\$287,000)	0				(\$1,659,950)
1	\$3,049.8	\$416	(\$333)	\$3,133	1	\$31,027.4	\$3,946	(\$3,156)	\$31,817
2	\$3,125.6	\$414	(\$331)	\$3,208	2	\$31,798.5	\$3,926	(\$3,141)	\$32,584
3	\$3,203.2	\$412	(\$330)	\$3,286	3	\$32,588.6	\$3,906	(\$3,125)	\$33,370
4	\$3,282.8	\$410	(\$328)	\$3,365	4	\$33,398.5	\$3,887	(\$3,109)	\$34,176
5	\$3,364.4	\$408	(\$327)	\$3,446	5	\$34,228.4	\$3,867	(\$3,094)	\$35,002
6	\$3,448.0	\$406	(\$325)	\$3,529	6	\$35,079.0	\$3,848	(\$3,078)	\$35,849
7	\$3,533.7	\$404	(\$323)	\$3,615	7	\$35,950.7	\$3,829	(\$3,063)	\$36,716
8	\$3,621.5	\$402	(\$322)	\$3,702	8	\$36,844.1	\$3,809	(\$3,048)	\$37,606
9	\$3,711.5	\$400	(\$320)	\$3,792	9	\$37,759.7	\$3,790	(\$3,032)	\$38,518
10	\$3,803.7	\$398	(\$318)	\$3,883	10	\$38,698.0	\$3,771	(\$3,017)	\$39,452
11	\$3,898.3	\$396	(\$317)	\$3,977	11	\$39,659.6	\$3,753	(\$3,002)	\$40,410
12	\$3,995.1	\$394	(\$315)	\$4,074	12	\$40,645.2	\$3,734	(\$2,987)	\$41,392
13	\$4,094.4	\$392	(\$314)	\$4,173	13	\$41,655.2	\$3,715	(\$2,972)	\$42,398
14	\$4,196.2	\$390	(\$312)	\$4,274	14	\$42,690.3	\$3,697	(\$2,957)	\$43,430
15	\$4,300.4	\$388	(\$311)	\$4,378	15	\$43,751.2	\$3,678	(\$2,942)	\$44,487
16	\$4,407.3	\$386	(\$309)	\$4,485	16	\$44,838.4	\$3,660	(\$2,928)	\$45,570
17	\$4,516.8	\$384	(\$307)	\$4,594	17	\$45,952.6	\$3,641	(\$2,913)	\$46,681
18	\$4,629.1	\$382	(\$306)	\$4,706	18	\$47,094.6	\$3,623	(\$2,899)	\$47,819
19	\$4,744.1	\$380	(\$304)	\$4,820	19	\$48,264.9	\$3,605	(\$2,884)	\$48,986
20	\$4,862.0	\$379	(\$303)	\$4,938	20	\$49,464.3	\$3,587	(\$2,870)	\$50,182
21	\$4,982.8	\$377	(\$301)	\$5,058	21	\$50,693.4	\$3,569	(\$2,855)	\$51,407
22	\$5,106.6	\$375	(\$300)	\$5,182	22	\$51,953.2	\$3,551	(\$2,841)	\$52,663
23	\$5,233.5	\$373	(\$298)	\$5,308	23	\$53,244.2	\$3,534	(\$2,827)	\$53,951
24	\$5,363.6	\$371	(\$297)	\$5,438	24	\$54,567.3	\$3,516	(\$2,813)	\$55,271
25	\$5,496.9	\$369	(\$295)	\$5,571	25	\$55,923.3	\$3,498	(\$2,799)	\$56,623
			IRR	#NUM!				IRR	N/A
			NPV	(\$215,875.22)				NPV	(\$937,311.38)
			AROI	-2.91%				AROI	-2.08%

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of: 3%
O&M inflation: 3%

Water Department Main Office & Garage					Water Filtration Plant				
Year	Energy Savings	REC	Maintenance Cost	Cash Flow	Year	Energy Savings	REC	Maintenance Cost	Cash Flow
0				(\$1,025,000)	0				(\$4,114,138)
1	\$6,197.9	\$1,388	(\$1,110)	\$6,475	1	\$64,188.6	\$10,254	(\$8,203)	\$66,239
2	\$6,351.9	\$1,381	(\$1,105)	\$6,628	2	\$65,783.7	\$10,203	(\$8,162)	\$67,824
3	\$6,509.7	\$1,374	(\$1,099)	\$6,785	3	\$67,418.4	\$10,152	(\$8,121)	\$69,449
4	\$6,671.5	\$1,367	(\$1,094)	\$6,945	4	\$69,093.8	\$10,101	(\$8,081)	\$71,114
5	\$6,837.3	\$1,360	(\$1,088)	\$7,109	5	\$70,810.7	\$10,050	(\$8,040)	\$72,821
6	\$7,007.2	\$1,354	(\$1,083)	\$7,278	6	\$72,570.4	\$10,000	(\$8,000)	\$74,570
7	\$7,181.3	\$1,347	(\$1,078)	\$7,451	7	\$74,373.8	\$9,950	(\$7,960)	\$76,364
8	\$7,359.8	\$1,340	(\$1,072)	\$7,628	8	\$76,221.9	\$9,900	(\$7,920)	\$78,202
9	\$7,542.7	\$1,333	(\$1,067)	\$7,809	9	\$78,116.1	\$9,851	(\$7,881)	\$80,086
10	\$7,730.1	\$1,327	(\$1,061)	\$7,995	10	\$80,057.2	\$9,802	(\$7,841)	\$82,018
11	\$7,922.2	\$1,320	(\$1,056)	\$8,186	11	\$82,046.7	\$9,753	(\$7,802)	\$83,997
12	\$8,119.1	\$1,314	(\$1,051)	\$8,382	12	\$84,085.5	\$9,704	(\$7,763)	\$86,026
13	\$8,320.8	\$1,307	(\$1,046)	\$8,582	13	\$86,175.1	\$9,655	(\$7,724)	\$88,106
14	\$8,527.6	\$1,300	(\$1,040)	\$8,788	14	\$88,316.5	\$9,607	(\$7,686)	\$90,238
15	\$8,739.5	\$1,294	(\$1,035)	\$8,998	15	\$90,511.2	\$9,559	(\$7,647)	\$92,423
16	\$8,956.7	\$1,288	(\$1,030)	\$9,214	16	\$92,760.4	\$9,511	(\$7,609)	\$94,663
17	\$9,179.3	\$1,281	(\$1,025)	\$9,435	17	\$95,065.5	\$9,464	(\$7,571)	\$96,958
18	\$9,407.4	\$1,275	(\$1,020)	\$9,662	18	\$97,427.8	\$9,416	(\$7,533)	\$99,311
19	\$9,641.1	\$1,268	(\$1,015)	\$9,895	19	\$99,848.9	\$9,369	(\$7,495)	\$101,723
20	\$9,880.7	\$1,262	(\$1,010)	\$10,133	20	\$102,330.2	\$9,322	(\$7,458)	\$104,195
21	\$10,126.3	\$1,256	(\$1,005)	\$10,377	21	\$104,873.1	\$9,276	(\$7,421)	\$106,728
22	\$10,377.9	\$1,249	(\$999)	\$10,628	22	\$107,479.2	\$9,229	(\$7,383)	\$109,325
23	\$10,635.8	\$1,243	(\$994)	\$10,884	23	\$110,150.0	\$9,183	(\$7,347)	\$111,987
24	\$10,900.1	\$1,237	(\$990)	\$11,147	24	\$112,887.3	\$9,137	(\$7,310)	\$114,715
25	\$11,170.9	\$1,231	(\$985)	\$11,417	25	\$115,692.5	\$9,092	(\$7,273)	\$117,511
IRR				#NUM!	IRR				#NUM!
NPV				(\$878,665.94)	NPV				(\$2,612,248.58)
AROI				-3.37%	AROI				-2.39%

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of: 3%
O&M inflation: 3%

Engine 4					Engine 5				
Year	Energy Savings	REC	Maintenance Cost	Cash Flow	Year	Energy Savings	REC	Maintenance Cost	Cash Flow
0				(\$406,295)	0				(\$396,688)
1	\$5,480.2	\$723	(\$578)	\$5,625	1	\$5,539.0	\$698	(\$559)	\$5,679
2	\$5,616.4	\$719	(\$576)	\$5,760	2	\$5,676.6	\$695	(\$556)	\$5,816
3	\$5,756.0	\$716	(\$573)	\$5,899	3	\$5,817.7	\$691	(\$553)	\$5,956
4	\$5,899.0	\$712	(\$570)	\$6,041	4	\$5,962.2	\$688	(\$550)	\$6,100
5	\$6,045.6	\$709	(\$567)	\$6,187	5	\$6,110.4	\$684	(\$548)	\$6,247
6	\$6,195.9	\$705	(\$564)	\$6,337	6	\$6,262.2	\$681	(\$545)	\$6,398
7	\$6,349.8	\$702	(\$561)	\$6,490	7	\$6,417.9	\$678	(\$542)	\$6,553
8	\$6,507.6	\$698	(\$558)	\$6,647	8	\$6,577.3	\$674	(\$539)	\$6,712
9	\$6,669.3	\$695	(\$556)	\$6,808	9	\$6,740.8	\$671	(\$537)	\$6,875
10	\$6,835.1	\$691	(\$553)	\$6,973	10	\$6,908.3	\$668	(\$534)	\$7,042
11	\$7,004.9	\$688	(\$550)	\$7,142	11	\$7,080.0	\$664	(\$531)	\$7,213
12	\$7,179.0	\$684	(\$547)	\$7,316	12	\$7,255.9	\$661	(\$529)	\$7,388
13	\$7,357.4	\$681	(\$545)	\$7,494	13	\$7,436.2	\$658	(\$526)	\$7,568
14	\$7,540.2	\$677	(\$542)	\$7,676	14	\$7,621.0	\$654	(\$523)	\$7,752
15	\$7,727.6	\$674	(\$539)	\$7,862	15	\$7,810.4	\$651	(\$521)	\$7,941
16	\$7,919.6	\$671	(\$537)	\$8,054	16	\$8,004.5	\$648	(\$518)	\$8,134
17	\$8,116.4	\$667	(\$534)	\$8,250	17	\$8,203.4	\$645	(\$516)	\$8,332
18	\$8,318.1	\$664	(\$531)	\$8,451	18	\$8,407.2	\$641	(\$513)	\$8,536
19	\$8,524.8	\$661	(\$529)	\$8,657	19	\$8,616.2	\$638	(\$510)	\$8,744
20	\$8,736.7	\$657	(\$526)	\$8,868	20	\$8,830.3	\$635	(\$508)	\$8,957
21	\$8,953.8	\$654	(\$523)	\$9,085	21	\$9,049.7	\$632	(\$505)	\$9,176
22	\$9,176.3	\$651	(\$521)	\$9,306	22	\$9,274.6	\$629	(\$503)	\$9,400
23	\$9,404.3	\$648	(\$518)	\$9,534	23	\$9,505.1	\$625	(\$500)	\$9,630
24	\$9,638.0	\$644	(\$515)	\$9,767	24	\$9,741.3	\$622	(\$498)	\$9,866
25	\$9,877.5	\$641	(\$513)	\$10,006	25	\$9,983.3	\$619	(\$495)	\$10,107
				IRR					IRR
				NPV					NPV
				AROI					AROI
				(\$278,571.85)					(\$267,703.01)
				-2.62%					-2.57%

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of: 3%
O&M inflation: 3%

Plant					Broad St Pump Station				
Year	Energy Savings	REC	Maintenance Cost	Cash Flow	Year	Energy Savings	REC	Maintenance Cost	Cash Flow
0				(\$21,330,013)	0				(\$449,000)
1	\$335,662.8	\$54,506	(\$43,605)	\$346,564	1	\$6,034.4	\$833	(\$666)	\$6,201
2	\$344,004.1	\$54,234	(\$43,387)	\$354,851	2	\$6,184.4	\$829	(\$663)	\$6,350
3	\$352,552.6	\$53,963	(\$43,170)	\$363,345	3	\$6,338.0	\$825	(\$660)	\$6,503
4	\$361,313.5	\$53,693	(\$42,954)	\$372,052	4	\$6,495.5	\$820	(\$656)	\$6,660
5	\$370,292.1	\$53,424	(\$42,739)	\$380,977	5	\$6,657.0	\$816	(\$653)	\$6,820
6	\$379,493.9	\$53,157	(\$42,526)	\$390,125	6	\$6,822.4	\$812	(\$650)	\$6,985
7	\$388,924.3	\$52,891	(\$42,313)	\$399,503	7	\$6,991.9	\$808	(\$647)	\$7,154
8	\$398,589.1	\$52,627	(\$42,102)	\$409,114	8	\$7,165.7	\$804	(\$643)	\$7,326
9	\$408,494.0	\$52,364	(\$41,891)	\$418,967	9	\$7,343.7	\$800	(\$640)	\$7,504
10	\$418,645.1	\$52,102	(\$41,682)	\$429,065	10	\$7,526.2	\$796	(\$637)	\$7,685
11	\$429,048.4	\$51,841	(\$41,473)	\$439,417	11	\$7,713.3	\$792	(\$634)	\$7,872
12	\$439,710.3	\$51,582	(\$41,266)	\$450,027	12	\$7,904.9	\$788	(\$631)	\$8,063
13	\$450,637.1	\$51,324	(\$41,059)	\$460,902	13	\$8,101.4	\$784	(\$627)	\$8,258
14	\$461,835.4	\$51,068	(\$40,854)	\$472,049	14	\$8,302.7	\$780	(\$624)	\$8,459
15	\$473,312.0	\$50,812	(\$40,650)	\$483,475	15	\$8,509.0	\$776	(\$621)	\$8,664
16	\$485,073.8	\$50,558	(\$40,447)	\$495,185	16	\$8,720.5	\$773	(\$618)	\$8,875
17	\$497,127.9	\$50,306	(\$40,244)	\$507,189	17	\$8,937.2	\$769	(\$615)	\$9,091
18	\$509,481.5	\$50,054	(\$40,043)	\$519,492	18	\$9,159.3	\$765	(\$612)	\$9,312
19	\$522,142.2	\$49,804	(\$39,843)	\$532,103	19	\$9,386.9	\$761	(\$609)	\$9,539
20	\$535,117.4	\$49,555	(\$39,644)	\$545,028	20	\$9,620.1	\$757	(\$606)	\$9,772
21	\$548,415.1	\$49,307	(\$39,446)	\$558,276	21	\$9,859.2	\$753	(\$603)	\$10,010
22	\$562,043.2	\$49,060	(\$39,248)	\$571,855	22	\$10,104.2	\$750	(\$600)	\$10,254
23	\$576,009.9	\$48,815	(\$39,052)	\$585,773	23	\$10,355.3	\$746	(\$597)	\$10,504
24	\$590,323.8	\$48,571	(\$38,857)	\$600,038	24	\$10,612.6	\$742	(\$594)	\$10,761
25	\$604,993.3	\$48,328	(\$38,663)	\$614,659	25	\$10,876.3	\$738	(\$591)	\$11,024
				IRR #NUM!					IRR #NUM!
				NPV (\$13,473,223.92)					NPV (\$308,240.16)
				ARO I -2.38%					ARO I -2.62%

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of: 3%
O&M inflation: 3%

Rockwell Park					Fire HQ				
Year	Energy Savings	REC	Maitenance Cost	Cash Flow	Year	Energy Savings	REC	Maintenance Cost	Cash Flow
0				(\$237,500)	0				(\$659,015)
1	\$3,595.6	\$289	(\$231)	\$3,653	1	\$9,611.4	\$1,373	(\$1,098)	\$9,886
2	\$3,684.9	\$288	(\$230)	\$3,742	2	\$9,850.3	\$1,366	(\$1,093)	\$10,123
3	\$3,776.5	\$286	(\$229)	\$3,834	3	\$10,095.0	\$1,359	(\$1,087)	\$10,367
4	\$3,870.3	\$285	(\$228)	\$3,927	4	\$10,345.9	\$1,352	(\$1,082)	\$10,616
5	\$3,966.5	\$283	(\$227)	\$4,023	5	\$10,603.0	\$1,345	(\$1,076)	\$10,872
6	\$4,065.1	\$282	(\$226)	\$4,121	6	\$10,866.5	\$1,339	(\$1,071)	\$11,134
7	\$4,166.1	\$281	(\$224)	\$4,222	7	\$11,136.5	\$1,332	(\$1,066)	\$11,403
8	\$4,269.6	\$279	(\$223)	\$4,325	8	\$11,413.2	\$1,325	(\$1,060)	\$11,678
9	\$4,375.7	\$278	(\$222)	\$4,431	9	\$11,696.9	\$1,319	(\$1,055)	\$11,961
10	\$4,484.4	\$276	(\$221)	\$4,540	10	\$11,987.5	\$1,312	(\$1,050)	\$12,250
11	\$4,595.9	\$275	(\$220)	\$4,651	11	\$12,285.4	\$1,306	(\$1,044)	\$12,547
12	\$4,710.1	\$274	(\$219)	\$4,765	12	\$12,590.7	\$1,299	(\$1,039)	\$12,851
13	\$4,827.1	\$272	(\$218)	\$4,882	13	\$12,903.6	\$1,293	(\$1,034)	\$13,162
14	\$4,947.1	\$271	(\$217)	\$5,001	14	\$13,224.3	\$1,286	(\$1,029)	\$13,481
15	\$5,070.0	\$270	(\$216)	\$5,124	15	\$13,552.9	\$1,280	(\$1,024)	\$13,809
16	\$5,196.0	\$268	(\$215)	\$5,250	16	\$13,889.7	\$1,273	(\$1,019)	\$14,144
17	\$5,325.1	\$267	(\$214)	\$5,379	17	\$14,234.8	\$1,267	(\$1,013)	\$14,488
18	\$5,457.5	\$266	(\$212)	\$5,511	18	\$14,588.6	\$1,261	(\$1,008)	\$14,841
19	\$5,593.1	\$264	(\$211)	\$5,646	19	\$14,951.1	\$1,254	(\$1,003)	\$15,202
20	\$5,732.1	\$263	(\$210)	\$5,785	20	\$15,322.6	\$1,248	(\$998)	\$15,572
21	\$5,874.5	\$262	(\$209)	\$5,927	21	\$15,703.4	\$1,242	(\$993)	\$15,952
22	\$6,020.5	\$260	(\$208)	\$6,073	22	\$16,093.6	\$1,236	(\$988)	\$16,341
23	\$6,170.1	\$259	(\$207)	\$6,222	23	\$16,493.5	\$1,229	(\$983)	\$16,739
24	\$6,323.4	\$258	(\$206)	\$6,375	24	\$16,903.4	\$1,223	(\$979)	\$17,148
25	\$6,480.6	\$256	(\$205)	\$6,532	25	\$17,323.5	\$1,217	(\$974)	\$17,567
IRR				N/A	IRR				#NUM!
NPV				(\$154,314.10)	NPV				(\$434,664.68)
AROI				-2.46%	AROI				-2.50%

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of: 3%
O&M inflation: 3%

Senior Center					Main Library				
Year	Energy Savings	REC	Maitenance Cost	Cash Flow	Year	Energy Savings	REC	Maintenance Cost	Cash Flow
0				(\$3,733.820)	0				(\$352,126)
1	\$71,944.3	\$9,276	(\$7,421)	\$73,800	1	\$4,070.4	\$584	(\$467)	\$4,187
2	\$73,732.1	\$9,230	(\$7,384)	\$75,578	2	\$4,171.6	\$581	(\$465)	\$4,288
3	\$75,564.3	\$9,184	(\$7,347)	\$77,401	3	\$4,275.2	\$578	(\$462)	\$4,391
4	\$77,442.1	\$9,138	(\$7,310)	\$79,270	4	\$4,381.5	\$575	(\$460)	\$4,496
5	\$79,366.5	\$9,092	(\$7,274)	\$81,185	5	\$4,490.3	\$572	(\$458)	\$4,605
6	\$81,338.8	\$9,047	(\$7,237)	\$83,148	6	\$4,601.9	\$569	(\$455)	\$4,716
7	\$83,360.1	\$9,001	(\$7,201)	\$85,160	7	\$4,716.3	\$567	(\$453)	\$4,830
8	\$85,431.6	\$8,956	(\$7,165)	\$87,223	8	\$4,833.5	\$564	(\$451)	\$4,946
9	\$87,554.5	\$8,912	(\$7,129)	\$89,337	9	\$4,953.6	\$561	(\$449)	\$5,066
10	\$89,730.3	\$8,867	(\$7,094)	\$91,504	10	\$5,076.7	\$558	(\$446)	\$5,188
11	\$91,960.1	\$8,823	(\$7,058)	\$93,725	11	\$5,202.8	\$555	(\$444)	\$5,314
12	\$94,245.3	\$8,779	(\$7,023)	\$96,001	12	\$5,332.1	\$552	(\$442)	\$5,443
13	\$96,587.3	\$8,735	(\$6,988)	\$98,334	13	\$5,464.6	\$550	(\$440)	\$5,575
14	\$98,987.4	\$8,691	(\$6,953)	\$100,726	14	\$5,600.4	\$547	(\$438)	\$5,710
15	\$101,447.3	\$8,648	(\$6,918)	\$103,177	15	\$5,739.6	\$544	(\$435)	\$5,848
16	\$103,968.3	\$8,604	(\$6,884)	\$105,689	16	\$5,882.2	\$542	(\$433)	\$5,991
17	\$106,551.9	\$8,561	(\$6,849)	\$108,264	17	\$6,028.4	\$539	(\$431)	\$6,136
18	\$109,199.7	\$8,519	(\$6,815)	\$110,903	18	\$6,178.2	\$536	(\$429)	\$6,285
19	\$111,913.3	\$8,476	(\$6,781)	\$113,608	19	\$6,331.7	\$533	(\$427)	\$6,438
20	\$114,694.3	\$8,434	(\$6,747)	\$116,381	20	\$6,489.1	\$531	(\$425)	\$6,595
21	\$117,544.5	\$8,391	(\$6,713)	\$119,223	21	\$6,650.3	\$528	(\$423)	\$6,756
22	\$120,465.5	\$8,349	(\$6,680)	\$122,135	22	\$6,815.6	\$525	(\$420)	\$6,921
23	\$123,459.0	\$8,308	(\$6,646)	\$125,121	23	\$6,985.0	\$523	(\$418)	\$7,090
24	\$126,527.0	\$8,266	(\$6,613)	\$128,180	24	\$7,158.5	\$520	(\$416)	\$7,263
25	\$129,671.2	\$8,225	(\$6,580)	\$131,316	25	\$7,336.4	\$518	(\$414)	\$7,440
IRR N/A					IRR #NUM!				
NPV (\$2,057,792.68)					NPV (\$257,106.25)				
AROI -2.02%					AROI -2.81%				

IRR, NPV, AROI - PV Solar Energy Systems

Financial Calculations

Based on inflation of: 3%

O&M inflation: 3%

Cherry Hill Pump Station					East Main Pump Station				
Year	Energy Savings	REC	Maintenance Cost	Cash Flow	Year	Energy Savings	REC	Maintenance Cost	Cash Flow
0				(\$150,313)	0				(\$200,938)
1	\$452.4	\$65	(\$52)	\$465	1	\$9,913.0	\$195	(\$156)	\$9,952
2	\$463.6	\$65	(\$52)	\$477	2	\$10,159.3	\$194	(\$155)	\$10,198
3	\$475.1	\$64	(\$52)	\$488	3	\$10,411.8	\$193	(\$155)	\$10,450
4	\$486.9	\$64	(\$51)	\$500	4	\$10,670.5	\$192	(\$154)	\$10,709
5	\$499.0	\$64	(\$51)	\$512	5	\$10,935.7	\$191	(\$153)	\$10,974
6	\$511.4	\$63	(\$51)	\$524	6	\$11,207.4	\$190	(\$152)	\$11,245
7	\$524.1	\$63	(\$51)	\$537	7	\$11,485.9	\$189	(\$152)	\$11,524
8	\$537.2	\$63	(\$50)	\$550	8	\$11,771.4	\$188	(\$151)	\$11,809
9	\$550.5	\$63	(\$50)	\$563	9	\$12,063.9	\$188	(\$150)	\$12,101
10	\$564.2	\$62	(\$50)	\$577	10	\$12,363.7	\$187	(\$149)	\$12,401
11	\$578.2	\$62	(\$50)	\$591	11	\$12,670.9	\$186	(\$149)	\$12,708
12	\$592.6	\$62	(\$49)	\$605	12	\$12,985.8	\$185	(\$148)	\$13,023
13	\$607.3	\$61	(\$49)	\$620	13	\$13,308.5	\$184	(\$147)	\$13,345
14	\$622.4	\$61	(\$49)	\$635	14	\$13,639.2	\$183	(\$146)	\$13,676
15	\$637.9	\$61	(\$49)	\$650	15	\$13,978.1	\$182	(\$146)	\$14,015
16	\$653.7	\$60	(\$48)	\$666	16	\$14,325.5	\$181	(\$145)	\$14,362
17	\$670.0	\$60	(\$48)	\$682	17	\$14,681.5	\$180	(\$144)	\$14,717
18	\$686.6	\$60	(\$48)	\$699	18	\$15,046.3	\$179	(\$143)	\$15,082
19	\$703.7	\$59	(\$48)	\$716	19	\$15,420.2	\$178	(\$143)	\$15,456
20	\$721.1	\$59	(\$47)	\$733	20	\$15,803.4	\$177	(\$142)	\$15,839
21	\$739.1	\$59	(\$47)	\$751	21	\$16,196.1	\$177	(\$141)	\$16,231
22	\$757.4	\$59	(\$47)	\$769	22	\$16,598.6	\$176	(\$141)	\$16,634
23	\$776.3	\$58	(\$47)	\$788	23	\$17,011.0	\$175	(\$140)	\$17,046
24	\$795.5	\$58	(\$46)	\$807	24	\$17,433.8	\$174	(\$139)	\$17,469
25	\$815.3	\$58	(\$46)	\$827	25	\$17,867.0	\$173	(\$138)	\$17,902
				IRR NPV AROI					IRR NPV AROI
				N/A (\$139,752.06) -3.69%					4.02% \$26,416.40 0.95%

Solar ECM

	City Hall	City Hall Annex	Water Department Main Office & Garage	Water Filtration Plant	Rockwell Park	Fire HQ	Engine 2	Engine 4	Engine 5	Senior Center	Main Library	Animal Control	City Yard	Plant	Broad St Pump Station	Cherry Hill Pump Station	Cross Pump Station	Drayla Pump Station
Assumed Inflation (Gas)																		
Initial Yearly Savings (Gas)																		
Assumed Inflation (Electricity)																		
Initial Yearly Savings (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Assumed Average Useful Life (Years)	\$19,085.14	\$4,928.82	\$6,197.87	\$64,188.60	\$3,595.55	\$9,611.41	\$452.36	\$3,783.60	\$5,480.24	\$5,538.96	\$71,944.26	\$4,070.41	\$3,049.77	\$31,027.42	\$335,662.84	\$6,034.41	\$452.36	\$452.36
	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Lifetime Savings	\$695,830.19	\$179,701.33	\$225,969.85	\$2,340,269.14	\$131,091.13	\$350,424.95	\$16,492.54	\$137,947.12	\$199,805.59	\$201,946.59	\$2,623,034.81	\$148,403.99	\$111,192.53	\$1,131,236.89	\$12,238,020.23	\$220,010.12	\$16,492.54	\$16,492.54
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	\$19,085.14	\$4,928.82	\$6,197.87	\$64,188.60	\$3,595.55	\$9,611.41	\$452.36	\$3,783.60	\$5,480.24	\$5,538.96	\$71,944.26	\$4,070.41	\$3,049.77	\$31,027.42	\$335,662.84	\$6,034.41	\$452.36	\$452.36
2	\$19,657.69	\$5,076.69	\$6,383.81	\$66,114.26	\$3,703.42	\$9,899.75	\$465.93	\$3,897.10	\$5,644.65	\$5,705.13	\$74,102.59	\$4,192.52	\$3,141.27	\$31,958.24	\$345,732.73	\$6,215.44	\$465.93	\$465.93
3	\$20,247.43	\$5,228.99	\$6,575.32	\$68,097.69	\$3,814.52	\$10,196.75	\$479.90	\$4,014.02	\$5,813.99	\$5,876.29	\$76,325.67	\$4,318.29	\$3,235.51	\$32,916.99	\$356,104.71	\$6,401.90	\$479.90	\$479.90
4	\$20,854.85	\$5,385.86	\$6,772.58	\$70,140.62	\$3,928.96	\$10,502.65	\$494.30	\$4,134.44	\$5,988.41	\$6,052.58	\$78,615.44	\$4,447.84	\$3,332.57	\$33,904.50	\$366,787.85	\$6,593.96	\$494.30	\$494.30
5	\$21,480.49	\$5,547.44	\$6,975.76	\$72,244.84	\$4,046.82	\$10,817.73	\$509.13	\$4,258.47	\$6,168.06	\$6,234.15	\$80,973.90	\$4,581.28	\$3,432.55	\$34,921.63	\$377,791.48	\$6,791.78	\$509.13	\$509.13
6	\$22,124.91	\$5,713.86	\$7,185.03	\$74,412.18	\$4,168.23	\$11,142.26	\$524.40	\$4,386.22	\$6,353.10	\$6,421.18	\$83,403.12	\$4,718.72	\$3,535.52	\$35,969.28	\$389,125.23	\$6,995.53	\$524.40	\$524.40
7	\$22,788.66	\$5,885.27	\$7,400.58	\$76,644.55	\$4,293.28	\$11,476.53	\$540.14	\$4,517.81	\$6,543.70	\$6,613.81	\$85,905.21	\$4,860.28	\$3,641.59	\$37,048.36	\$400,798.99	\$7,205.40	\$540.14	\$540.14
8	\$23,472.32	\$6,061.83	\$7,622.60	\$78,943.88	\$4,422.07	\$11,820.82	\$556.34	\$4,653.35	\$6,740.01	\$6,812.23	\$88,482.37	\$5,006.09	\$3,750.84	\$38,159.81	\$412,822.96	\$7,421.56	\$556.34	\$556.34
9	\$24,176.49	\$6,243.69	\$7,851.28	\$81,312.20	\$4,554.74	\$12,175.45	\$573.03	\$4,792.95	\$6,942.21	\$7,016.60	\$91,136.84	\$5,156.27	\$3,863.36	\$39,304.61	\$425,207.64	\$7,644.21	\$573.03	\$573.03
10	\$24,901.78	\$6,431.00	\$8,086.82	\$83,751.56	\$4,691.38	\$12,540.71	\$590.22	\$4,936.73	\$7,150.47	\$7,227.09	\$93,870.94	\$5,310.96	\$3,979.26	\$40,483.74	\$437,963.87	\$7,873.54	\$590.22	\$590.22
11	\$25,648.83	\$6,623.93	\$8,329.42	\$86,264.11	\$4,832.12	\$12,916.93	\$607.93	\$5,084.84	\$7,364.99	\$7,443.91	\$96,687.07	\$5,470.28	\$4,098.64	\$41,698.26	\$451,102.79	\$8,109.74	\$607.93	\$607.93
12	\$26,418.30	\$6,822.65	\$8,579.30	\$88,852.03	\$4,977.08	\$13,304.44	\$626.17	\$5,237.38	\$7,585.94	\$7,667.22	\$99,587.68	\$5,634.39	\$4,221.60	\$42,949.21	\$464,635.87	\$8,353.03	\$626.17	\$626.17
13	\$27,210.85	\$7,027.33	\$8,836.68	\$91,517.60	\$5,126.40	\$13,703.57	\$644.95	\$5,394.50	\$7,813.51	\$7,897.24	\$102,575.31	\$5,803.43	\$4,348.25	\$44,237.68	\$478,574.95	\$8,603.62	\$644.95	\$644.95
14	\$28,027.17	\$7,238.15	\$9,101.78	\$94,263.12	\$5,280.19	\$14,114.68	\$664.30	\$5,556.34	\$8,047.92	\$8,134.16	\$105,652.57	\$5,977.53	\$4,478.70	\$45,564.81	\$492,932.20	\$8,861.73	\$664.30	\$664.30
15	\$28,867.99	\$7,455.29	\$9,374.84	\$97,091.02	\$5,438.59	\$14,538.12	\$684.23	\$5,723.03	\$8,289.36	\$8,378.18	\$108,822.15	\$6,156.85	\$4,613.06	\$46,931.76	\$507,720.16	\$9,127.59	\$684.23	\$684.23
16	\$29,734.03	\$7,678.95	\$9,656.08	\$100,003.75	\$5,601.75	\$14,974.26	\$704.75	\$5,894.72	\$8,538.04	\$8,629.53	\$112,086.81	\$6,341.56	\$4,751.45	\$48,339.71	\$522,951.77	\$9,401.41	\$704.75	\$704.75
17	\$30,626.05	\$7,909.32	\$9,945.76	\$103,003.86	\$5,769.80	\$15,423.49	\$725.90	\$6,071.56	\$8,794.18	\$8,888.41	\$115,449.42	\$6,531.81	\$4,893.99	\$49,789.90	\$538,640.32	\$9,683.46	\$725.90	\$725.90
18	\$31,544.83	\$8,146.60	\$10,244.14	\$106,093.98	\$5,942.90	\$15,886.20	\$747.67	\$6,253.71	\$9,058.00	\$9,155.07	\$118,912.90	\$6,727.76	\$5,040.81	\$51,283.60	\$554,799.53	\$9,973.96	\$747.67	\$747.67
19	\$32,491.17	\$8,390.99	\$10,551.46	\$109,276.80	\$6,121.18	\$16,362.78	\$770.10	\$6,441.32	\$9,329.74	\$9,429.72	\$122,480.29	\$6,929.59	\$5,192.04	\$52,822.10	\$571,443.52	\$10,273.18	\$770.10	\$770.10
20	\$33,465.91	\$8,642.72	\$10,868.01	\$112,555.10	\$6,304.82	\$16,853.67	\$793.21	\$6,634.56	\$9,609.64	\$9,712.61	\$126,154.70	\$7,137.48	\$5,347.80	\$54,406.77	\$588,586.82	\$10,581.37	\$793.21	\$793.21
21	\$34,469.89	\$8,902.01	\$11,194.05	\$115,931.75	\$6,493.96	\$17,359.28	\$817.00	\$6,833.59	\$9,897.93	\$10,003.99	\$129,939.34	\$7,351.61	\$5,508.23	\$56,038.97	\$606,244.43	\$10,898.81	\$817.00	\$817.00
22	\$35,503.98	\$9,169.07	\$11,529.87	\$119,409.70	\$6,688.78	\$17,880.05	\$841.51	\$7,038.60	\$10,194.86	\$10,304.11	\$133,837.52	\$7,572.15	\$5,673.48	\$57,720.14	\$624,431.76	\$11,225.78	\$841.51	\$841.51
23	\$36,569.10	\$9,444.14	\$11,875.76	\$122,992.00	\$6,889.45	\$18,416.46	\$866.76	\$7,249.76	\$10,500.71	\$10,613.23	\$137,852.64	\$7,799.32	\$5,843.68	\$59,451.74	\$643,164.71	\$11,562.55	\$866.76	\$866.76
24	\$37,666.18	\$9,727.46	\$12,232.04	\$126,681.76	\$7,096.13	\$18,968.95	\$892.76	\$7,467.25	\$10,815.73	\$10,931.63	\$141,988.22	\$8,033.30	\$6,018.99	\$61,235.30	\$662,459.65	\$11,909.43	\$892.76	\$892.76
25	\$38,796.16	\$10,019.29	\$12,599.00	\$130,482.21	\$7,309.01	\$19,538.02	\$919.54	\$7,691.27	\$11,140.20	\$11,259.58	\$146,247.87	\$8,274.30	\$6,199.56	\$63,072.36	\$682,333.44	\$12,266.71	\$919.54	\$919.54

IRR, NPV, AROI - Wind Energy Systems

Financial Calculations

Based on inflation of: 3%

O&M inflation: 3%

Wind Turbine - Minimum Wind Speed				Wind Turbine - Maximum Wind Speed				Wind Turbine - Average Wind Speed			
Year	Energy Savings	REC Sales	Cash Flow	Year	Energy Savings	REC Sales	Cash Flow	Year	Energy Savings	REC Sales	Cash Flow
0			(\$71,995)	0			(\$71,995)	0			(\$71,995)
1	\$1,582.2	\$136	\$1,718	1	\$2,839.0	\$244	\$3,083	1	\$2,109.5	\$181	\$2,290
2	\$1,621.5	\$135	\$1,756	2	\$2,909.6	\$243	\$3,153	2	\$2,161.9	\$180	\$2,342
3	\$1,661.8	\$135	\$1,797	3	\$2,981.9	\$241	\$3,223	3	\$2,215.6	\$179	\$2,395
4	\$1,703.1	\$134	\$1,837	4	\$3,056.0	\$240	\$3,296	4	\$2,270.7	\$179	\$2,450
5	\$1,745.4	\$133	\$1,878	5	\$3,131.9	\$239	\$3,371	5	\$2,327.1	\$178	\$2,505
6	\$1,788.8	\$133	\$1,922	6	\$3,209.7	\$238	\$3,448	6	\$2,384.9	\$177	\$2,562
7	\$1,833.2	\$132	\$1,965	7	\$3,289.5	\$237	\$3,526	7	\$2,444.2	\$176	\$2,620
8	\$1,878.8	\$131	\$2,010	8	\$3,371.2	\$235	\$3,606	8	\$2,504.9	\$175	\$2,680
9	\$1,925.5	\$131	\$2,056	9	\$3,455.0	\$234	\$3,689	9	\$2,567.2	\$174	\$2,741
10	\$1,973.3	\$130	\$2,103	10	\$3,540.9	\$233	\$3,774	10	\$2,631.0	\$173	\$2,804
11	\$2,022.4	\$129	\$2,151	11	\$3,628.8	\$232	\$3,861	11	\$2,696.3	\$172	\$2,868
12	\$2,072.6	\$129	\$2,202	12	\$3,719.0	\$231	\$3,950	12	\$2,763.3	\$172	\$2,935
13	\$2,124.1	\$128	\$2,252	13	\$3,811.4	\$230	\$4,041	13	\$2,832.0	\$171	\$3,003
14	\$2,176.9	\$127	\$2,304	14	\$3,906.2	\$229	\$4,135	14	\$2,902.4	\$170	\$3,072
15	\$2,231.0	\$127	\$2,358	15	\$4,003.2	\$227	\$4,230	15	\$2,974.5	\$169	\$3,144
16	\$2,286.4	\$126	\$2,412	16	\$4,102.7	\$226	\$4,329	16	\$3,048.4	\$168	\$3,216
17	\$2,343.2	\$125	\$2,468	17	\$4,204.7	\$225	\$4,430	17	\$3,124.2	\$167	\$3,291
18	\$2,401.5	\$125	\$2,526	18	\$4,309.1	\$224	\$4,533	18	\$3,201.8	\$166	\$3,368
19	\$2,461.2	\$124	\$2,585	19	\$4,416.2	\$223	\$4,639	19	\$3,281.4	\$166	\$3,447
20	\$2,522.3	\$124	\$2,646	20	\$4,526.0	\$222	\$4,748	20	\$3,362.9	\$165	\$3,528
21	\$2,585.0	\$123	\$2,708	21	\$4,638.4	\$221	\$4,859	21	\$3,446.5	\$164	\$3,610
22	\$2,649.2	\$122	\$2,771	22	\$4,753.7	\$220	\$4,974	22	\$3,532.1	\$163	\$3,695
23	\$2,715.1	\$122	\$2,837	23	\$4,871.8	\$218	\$5,090	23	\$3,619.9	\$162	\$3,782
24	\$2,782.5	\$121	\$2,904	24	\$4,992.9	\$217	\$5,210	24	\$3,709.9	\$161	\$3,871
25	\$2,851.7	\$121	\$2,973	25	\$5,117.0	\$216	\$5,333	25	\$3,802.1	\$161	\$3,963
			IRR -1.57%				IRR 2.65%				IRR 0.40%
			NPV (\$33,563.02)				NPV (\$3,035.45)				NPV (\$20,755.73)
			AROI -1.61%				AROI 0.28%				AROI -0.82%

ECM	Bristol, CT Wind Turbine - Minimum Wind Speed	Bristol, CT Wind Turbine - Maximum Wind Speed	Bristol, CT Wind Turbine - Average Wind Speed
Assumed Inflation (Gas)			
Initial Yearly Savings (Gas)			
Assumed Inflation (Electricity)	3%	3%	3%
Initial Yearly Savings (Electricity)	\$1,582.20	\$2,839.00	\$2,109.50
Assumed Average Useful Life (Years)	5	5	5
Lifetime Savings	\$57,685.85	\$103,507.85	\$76,910.82
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$1,582.20	\$2,839.00	\$2,109.50
2	\$1,629.67	\$2,924.17	\$2,172.79
3	\$1,678.56	\$3,011.90	\$2,237.97
4	\$1,728.91	\$3,102.25	\$2,305.11
5	\$1,780.78	\$3,195.32	\$2,374.26
6	\$1,834.20	\$3,291.18	\$2,445.49
7	\$1,889.23	\$3,389.91	\$2,518.85
8	\$1,945.91	\$3,491.61	\$2,594.42
9	\$2,004.28	\$3,596.36	\$2,672.25
10	\$2,064.41	\$3,704.25	\$2,752.42
11	\$2,126.34	\$3,815.38	\$2,834.99
12	\$2,190.13	\$3,929.84	\$2,920.04
13	\$2,255.84	\$4,047.74	\$3,007.64
14	\$2,323.51	\$4,169.17	\$3,097.87
15	\$2,393.22	\$4,294.24	\$3,190.81
16	\$2,465.02	\$4,423.07	\$3,286.53
17	\$2,538.97	\$4,555.76	\$3,385.13
18	\$2,615.14	\$4,692.43	\$3,486.68
19	\$2,693.59	\$4,833.21	\$3,591.28
20	\$2,774.40	\$4,978.20	\$3,699.02
21	\$2,857.63	\$5,127.55	\$3,809.99
22	\$2,943.36	\$5,281.38	\$3,924.29
23	\$3,031.66	\$5,439.82	\$4,042.02
24	\$3,122.61	\$5,603.01	\$4,163.28
25	\$3,216.29	\$5,771.10	\$4,288.18

IRR, NPV, AROI - HVAC ECRMS

Chiller Upgrade City Hall		Pipe Insulation City Hall		DDC City Hall		Furnace Upgrade City Hall Annex		CRAC Upgrade City Hall		Chiller Upgrade Water Filtration Plant		Boiler Upgrade Water Filtration Plant		NARC Office Air Handler Police Department		Unit Heater Upgrade Recreation Building		Generator Muzzy Field	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$212,756.00)	0	(\$497.00)	0	(\$142,589.00)	0	(\$8,418.00)	0	(\$55,452.00)	0	(\$194,068.00)	0	(\$107,370.00)	0	(\$15,041.00)	0	(\$8,418.00)	0	(\$180,106.00)
1	\$2,175.00	1	\$26.00	1	\$6,813.00	1	\$463.00	1	\$3,759.00	1	\$1,609.00	1	\$6,755.00	1	\$5,451.00	1	\$604.80	1	\$12,425.00
2	\$2,240.25	2	\$26.78	2	\$7,017.39	2	\$476.89	2	\$3,871.77	2	\$1,657.27	2	\$6,957.65	2	\$5,614.53	2	\$622.94	2	\$12,797.75
3	\$2,307.46	3	\$27.58	3	\$7,227.91	3	\$491.20	3	\$3,987.92	3	\$1,706.99	3	\$7,166.38	3	\$5,782.97	3	\$641.63	3	\$13,181.68
4	\$2,376.68	4	\$28.41	4	\$7,444.75	4	\$505.93	4	\$4,107.56	4	\$1,758.20	4	\$7,381.37	4	\$5,956.45	4	\$660.88	4	\$13,577.13
5	\$2,447.98	5	\$29.26	5	\$7,668.09	5	\$521.11	5	\$4,230.79	5	\$1,810.94	5	\$7,602.81	5	\$6,135.15	5	\$680.71	5	\$13,984.45
6	\$2,521.42	6	\$30.14	6	\$7,898.13	6	\$536.74	6	\$4,357.71	6	\$1,865.27	6	\$7,830.90	6	\$6,319.20	6	\$701.13	6	\$14,403.98
7	\$2,597.06	7	\$31.05	7	\$8,135.08	7	\$552.85	7	\$4,488.44	7	\$1,921.23	7	\$8,065.82	7	\$6,508.78	7	\$722.16	7	\$14,836.10
8	\$2,674.98	8	\$31.98	8	\$8,379.13	8	\$569.43	8	\$4,623.10	8	\$1,978.87	8	\$8,307.90	8	\$6,704.04	8	\$743.83	8	\$15,281.18
9	\$2,755.22	9	\$32.94	9	\$8,630.50	9	\$586.51	9	\$4,761.79	9	\$2,038.23	9	\$8,557.03	9	\$6,905.16	9	\$766.14	9	\$15,739.62
10	\$2,837.88	10	\$33.92	10	\$8,889.42	10	\$604.11	10	\$4,904.64	10	\$2,099.38	10	\$8,813.74	10	\$7,112.32	10	\$789.13	10	\$16,211.81
11	\$2,923.02	11	\$34.94	11	\$9,156.10	11	\$622.23	11	\$5,051.78	11	\$2,162.36	11	\$9,078.16	11	\$7,325.69	11	\$812.80	11	\$16,698.16
12	\$3,010.71	12	\$35.99	12	\$9,430.79	12	\$640.90	12	\$5,203.34	12	\$2,227.23	12	\$9,350.50	12	\$7,545.46	12	\$837.18	12	\$17,199.11
13	\$3,101.03	13	\$37.07	13	\$9,713.71	13	\$660.13	13	\$5,359.44	13	\$2,294.05	13	\$9,631.01	13	\$7,771.82	13	\$862.30	13	\$17,715.08
14	\$3,194.06	14	\$38.18	14	\$10,005.12	14	\$679.93	14	\$5,520.22	14	\$2,362.87	14	\$9,919.95	14	\$8,004.98	14	\$888.17	14	\$18,246.53
15	\$3,289.88	15	\$39.33	15	\$10,305.27	15	\$700.33	15	\$5,685.82	15	\$2,433.76	15	\$10,217.54	15	\$8,245.13	15	\$914.81	15	\$18,793.93
16	\$3,388.58	16	\$40.51			16	\$721.34	16	\$5,856.40	16	\$2,506.77	16	\$10,524.07	16	\$8,492.48	16	\$942.26	16	\$19,357.75
17	\$3,490.24	17	\$41.72			17	\$742.98	17	\$6,032.09	17	\$2,581.97	17	\$10,839.79	17	\$8,747.25	17	\$970.53	17	\$19,938.48
18	\$3,594.94	18	\$42.97			18	\$765.27	18	\$6,213.05	18	\$2,659.43	18	\$11,164.99	18	\$9,009.67	18	\$999.64	18	\$20,536.63
19	\$3,702.79	19	\$44.26			19		19	\$6,399.45	19	\$2,739.21	19	\$11,499.94	19	\$9,279.96	19		19	\$21,152.73
20	\$3,813.88	20	\$45.59			20		20		20	\$2,821.39	20	\$11,844.93	20	\$9,558.36	20		20	\$21,787.31
21	\$3,928.29	21	\$46.96			21		21		21	\$2,906.03	21	\$12,200.28	21					
22	\$4,046.14	22	\$48.37			22		22		22	\$2,993.21	22	\$12,566.29	22					
23	\$4,167.52	23	\$49.82			23		23		23	\$3,083.01	23	\$12,943.28	23					
24	\$4,292.55	24	\$51.31			24		24		24	\$3,175.50	24	\$13,331.58	24					
IRR	-6.56%	IRR	4.70%	IRR	-1.35%	IRR	2.57%	IRR	5.41%	IRR	-7.70%	IRR	6.42%	IRR	39.15%	IRR	5.59%	IRR	7.40%
NPV	(\$162,076.39)	NPV	\$108.83	NPV	(\$43,370.55)	NPV	(\$326.74)	NPV	\$13,888.78	NPV	(\$156,576.74)	NPV	\$50,028.06	NPV	\$90,803.66	NPV	\$2,151.32	NPV	\$81,156.14
AROI	-3.14%	AROI	1.06%	AROI	-1.89%	AROI	-0.06%	AROI	1.52%	AROI	-3.34%	AROI	2.12%	AROI	31.24%	AROI	1.63%	AROI	2.76%

Boiler Controls Fire Department		Pipe Insulation Fire Department		Boiler Upgrade Fire Headquarters		Boiler Upgrade Engine 3		DDC Controls Senior Center		Boiler Upgrade Senior Center		Chiller Upgrade Public Library		Boiler Upgrade Public Library		Boiler Controls Youth Services		Waste Water Heat Pump Water Pollution Control		Plant Water Preheat Water Pollution Control	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$93,567.00)	0	(\$1,150.00)	0	(\$107,370.00)	0	(\$45,846.00)	0	(\$68,245.00)	0	(\$134,479.00)	0	(\$69,846.00)	0	(\$70,347.00)	0	(\$18,713.00)	0	(\$103,336)	0	(\$25,079)
1	\$2,699.00	1	\$1,201.00	1	\$3,504.00	1	\$2,079.00	1	\$5,867.00	1	\$12,526.00	1	\$483.00	1	\$4,487.00	1	\$511.00	1	\$8,061.00	1	\$2,219.00
2	\$2,779.97	2	\$1,237.03	2	\$3,609.12	2	\$2,141.37	2	\$6,043.01	2	\$12,901.78	2	\$497.49	2	\$4,621.61	2	\$526.33	2	\$8,134.56	2	\$2,263.38
3	\$2,863.37	3	\$1,274.14	3	\$3,717.39	3	\$2,205.61	3	\$6,224.30	3	\$13,288.83	3	\$512.41	3	\$4,760.26	3	\$542.12	3	\$8,206.96	3	\$2,308.65
4	\$2,949.27	4	\$1,312.37	4	\$3,828.92	4	\$2,271.78	4	\$6,411.03	4	\$13,687.50	4	\$527.79	4	\$4,903.07	4	\$558.38	4	\$8,279.10	4	\$2,354.82
5	\$3,037.75	5	\$1,351.74	5	\$3,943.78	5	\$2,339.93	5	\$6,603.36	5	\$14,098.12	5	\$543.62	5	\$5,050.16	5	\$575.14	5	\$8,347.88	5	\$2,401.92
6	\$3,128.88	6	\$1,392.29	6	\$4,062.10	6	\$2,410.13	6	\$6,801.46	6	\$14,521.07	6	\$559.93	6	\$5,201.66	6	\$592.39	6	\$8,416.17	6	\$2,449.96
7	\$3,222.75	7	\$1,434.06	7	\$4,183.96	7	\$2,482.43	7	\$7,005.50	7	\$14,956.70	7	\$576.73	7	\$5,357.71	7	\$610.16	7	\$8,482.87	7	\$2,498.95
8	\$3,319.43	8	\$1,477.08	8	\$4,309.48	8	\$2,556.91	8	\$7,215.67	8	\$15,405.40	8	\$594.03	8	\$5,518.44	8	\$628.47	8	\$8,547.86	8	\$2,548.93
9	\$3,419.01	9	\$1,521.39	9	\$4,438.76	9	\$2,633.61	9	\$7,432.14	9	\$15,867.56	9	\$611.85	9	\$5,684.00	9	\$647.32	9	\$8,611.01	9	\$2,599.91
10	\$3,521.58	10	\$1,567.03	10	\$4,571.93	10	\$2,712.62	10	\$7,655.10	10	\$16,343.59	10	\$630.21	10	\$5,854.52	10	\$666.74	10	\$8,672.18	10	\$2,651.91
11	\$3,627.23	11	\$1,614.04	11	\$4,709.08	11	\$2,794.00	11	\$7,884.76	11	\$16,833.90	11	\$649.11	11	\$6,030.15	11	\$686.74	11	\$8,731.25	11	\$2,704.95
12	\$3,736.05	12	\$1,662.46	12	\$4,850.36	12	\$2,877.82	12	\$8,121.30	12	\$17,338.91	12	\$668.58	12	\$6,211.06	12	\$707.34	12	\$8,788.07	12	\$2,759.05
13	\$3,848.13	13	\$1,712.34	13	\$4,995.87	13	\$2,964.16	13	\$8,364.94	13	\$17,859.08	13	\$688.64	13	\$6,397.39	13	\$728.56	13	\$8,842.48	13	\$2,814.23
14	\$3,963.57	14	\$1,763.71	14	\$5,145.74	14	\$3,053.08	14	\$8,615.89	14	\$18,394.85	14	\$709.30	14	\$6,589.31	14	\$750.42	14	\$8,894.35	14	\$2,870.51
15	\$4,082.48	15	\$1,816.62	15	\$5,300.11	15	\$3,144.67	15	\$8,874.36	15	\$18,946.70	15	\$730.58	15	\$6,786.99	15	\$772.93	15	\$8,943.51	15	\$2,927.92
16		16	\$1,871.12	16	\$5,459.12	16	\$3,239.01	16		16	\$19,515.10	16	\$752.50	16	\$6,990.60	16		16	\$8,989.78	16	
17		17	\$1,927.25	17	\$5,622.89	17	\$3,336.18	17		17	\$20,100.55	17	\$775.07	17	\$7,200.32	17		17	\$9,033.01	17	
18		18	\$1,985.07	18	\$5,791.58	18	\$3,436.27	18		18	\$20,703.57	18	\$798.33	18	\$7,416.33	18		18	\$9,073.00	18	
19		19	\$2,044.62	19	\$5,965.33	19	\$3,539.36	19		19	\$21,324.68	19	\$822.28	19	\$7,638.82	19		19	\$9,109.57	19	
20		20	\$2,105.96	20	\$6,144.29	20	\$3,645.54	20		20	\$21,964.42	20	\$846.94	20	\$7,867.98	20		20	\$9,142.53	20	
21		21	\$2,169.14	21	\$6,328.61	21	\$3,754.91	21		21	\$22,623.35	21	\$872.35	21	\$8,104.02	21		21	\$9,171.67	21	
22		22	\$2,234.21	22	\$6,518.47	22	\$3,867.55	22		22	\$23,302.05	22	\$898.52	22	\$8,347.14	22		22	\$9,196.78	22	
23		23	\$2,301.24	23	\$6,714.03	23	\$3,983.58	23		23	\$24,001.11	23	\$925.48	23	\$8,597.56	23		23	\$9,217.64	23	
24		24	\$2,370.28	24	\$6,915.45	24	\$4,103.09	24		24	\$24,721.14	24	\$953.24	24	\$8,855.48	24		24	\$9,234.02	24	
IRR	-6.57%	IRR	107.43%	IRR	0.85%	IRR	3.46%	IRR	6.04%	IRR	10.64%	IRR	-8.66%	IRR	6.55%	IRR	-7.09%	IRR	6.48%	IRR	5.56%
NPV	(\$54,261.17)	NPV	\$26,834.47	NPV	(\$25,723.40)	NPV	\$2,596.72	NPV	\$17,196.75	NPV	\$157,388.96	NPV	(\$58,591.63)	NPV	\$34,204.46	NPV	(\$11,271.25)	NPV	\$43,680.49	NPV	\$5,131.09
AROI	-3.78%	AROI	100.27%	AROI	-0.90%	AROI	0.37%	AROI	1.93%	AROI	5.15%	AROI	-3.48%	AROI	2.21%	AROI	-3.94%	AROI	3.63%	AROI	2.18%

ECM	City Hall - Chiller Upgrade	City Hall - Pipe Insulation	City Hall - DDC	City Hall Annex - Furnace Upgrade	City Hall - CRAC Upgrade	Water Filtration Plant - Chiller Upgrade	Water Filtration Plant - Boiler Upgrade	Police Department - Air Handler	Recreation Building - Unit Heater Upgrade	Muzzy Field - Generator	
Assumed Inflation (Gas, Oil)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	
Initial Yearly Savings (Gas, Oil)	\$0.00		\$4,757.00	\$463.00			\$5,255.00	\$4,212.00	\$605.00		
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	
Initial Yearly Savings (Electricity)	\$2,175.00	\$26.00	\$2,056.00		\$3,759.00	\$1,609.00		\$1,239.00		\$12,425.00	
Assumed Average Useful Life (Years)	24	24	15	18	19	24	24	20	18	20	
Lifetime Savings	\$74,877.57	\$895.09	\$120,504.15	\$9,913.90	\$94,414.31	\$55,392.19	\$159,866.89	\$135,632.92	\$12,954.45	\$333,864.40	
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	
1	\$2,175.00	\$26.00	\$6,813.00	\$463.00	\$3,759.00	\$1,609.00	\$5,255.00	\$5,451.00	\$605.00	\$12,425.00	
2	\$2,240.25	\$26.78	\$6,969.82	\$472.26	\$3,871.77	\$1,657.27	\$5,360.10	\$5,572.41	\$617.10	\$12,797.75	
3	\$2,307.46	\$27.58	\$7,130.39	\$481.71	\$3,987.92	\$1,706.99	\$5,467.30	\$5,696.62	\$629.44	\$13,181.68	
4	\$2,376.68	\$28.41	\$7,294.81	\$491.34	\$4,107.56	\$1,758.20	\$5,576.65	\$5,823.70	\$642.03	\$13,577.13	
5	\$2,447.98	\$29.26	\$7,463.18	\$501.17	\$4,230.79	\$1,810.94	\$5,688.18	\$5,953.71	\$654.87	\$13,984.45	
6	\$2,521.42	\$30.14	\$7,635.58	\$511.19	\$4,357.71	\$1,865.27	\$5,801.94	\$6,086.73	\$667.97	\$14,403.98	
7	\$2,597.06	\$31.05	\$7,812.13	\$521.41	\$4,488.44	\$1,921.23	\$5,917.98	\$6,222.83	\$681.33	\$14,836.10	
8	\$2,674.98	\$31.98	\$7,992.92	\$531.84	\$4,623.10	\$1,978.87	\$6,036.34	\$6,362.08	\$694.95	\$15,281.18	
9	\$2,755.22	\$32.94	\$8,178.06	\$542.48	\$4,761.79	\$2,038.23	\$6,157.07	\$6,504.56	\$708.85	\$15,739.62	
10	\$2,837.88	\$33.92	\$8,367.67	\$553.33	\$4,904.64	\$2,099.38	\$6,280.21	\$6,650.34	\$723.03	\$16,211.81	
11	\$2,923.02	\$34.94	\$8,561.85	\$564.39	\$5,051.78	\$2,162.36	\$6,405.82	\$6,799.52	\$737.49	\$16,698.16	
12	\$3,010.71	\$35.99	\$8,760.72	\$575.68	\$5,203.34	\$2,227.23	\$6,533.93	\$6,952.16	\$752.24	\$17,199.11	
13	\$3,101.03	\$37.07	\$8,964.39	\$587.20	\$5,359.44	\$2,294.05	\$6,664.61	\$7,108.35	\$767.29	\$17,715.08	
14	\$3,194.06	\$38.18	\$9,172.99	\$598.94	\$5,520.22	\$2,362.87	\$6,797.90	\$7,268.18	\$782.63	\$18,246.53	
15	\$3,289.88	\$39.33	\$9,386.64	\$610.92	\$5,685.82	\$2,433.76	\$6,933.86	\$7,431.74	\$798.28	\$18,793.93	
16	\$3,388.58	\$40.51		\$623.14	\$5,856.40	\$2,506.77	\$7,072.54	\$7,599.12	\$814.25	\$19,357.75	
17	\$3,490.24	\$41.72		\$635.60	\$6,032.09	\$2,581.97	\$7,213.99	\$7,770.40	\$830.54	\$19,938.48	
18	\$3,594.94	\$42.97		\$648.31	\$6,213.05	\$2,659.43	\$7,358.27	\$7,945.70	\$847.15	\$20,536.63	
19	\$3,702.79	\$44.26			\$6,399.45	\$2,739.21	\$7,505.43	\$8,125.09		\$21,152.73	
20	\$3,813.88	\$45.59				\$2,821.39	\$7,655.54	\$8,308.68		\$21,787.31	
21	\$3,928.29	\$46.96				\$2,906.03	\$7,808.65				
22	\$4,046.14	\$48.37				\$2,993.21	\$7,964.83				
23	\$4,167.52	\$49.82				\$3,083.01	\$8,124.12				
24	\$4,292.55	\$51.31				\$3,175.50	\$8,286.61				
ECM	Fire Department - Boiler Controls	Fire Department - Pipe Insulation	Fire Headquarters - Boiler Upgrade	Engine 3 - Boiler Upgrade	Senior Center - Boiler Controls	Senior Center - Boiler Upgrade	Public Library - Chiller Upgrade	Public Library - Boiler Upgrade	Youth Services - Boiler Controls	Water Polution Control - Waste Water Heat Pump	Water Polution Control - Preheat
Assumed Inflation (Gas, Oil)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas, Oil)		\$2,699.00	\$1,201.00	\$2,004.00	\$1,329.00	\$5,867.00	\$11,026.00	\$0.00	\$3,737.00	\$16,827.00	\$2,469.00
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$12,425.00							\$483.00		-\$8,766.00	
Assumed Average Useful Life (Years)	20	15	24	24	24	15	24	24	24	24	15
Lifetime Savings	\$333,864.40	\$46,674.93	\$36,536.66	\$60,965.41	\$40,430.66	\$101,460.48	\$335,431.46	\$16,627.99	\$113,686.50	\$210,126.24	\$39,439.65
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	\$12,425.00	\$2,699.00	\$1,201.00	\$2,004.00	\$1,329.00	\$5,867.00	\$11,026.00	\$483.00	\$3,737.00	\$8,061.00	\$2,469.00
2	\$12,797.75	\$2,752.98	\$1,225.02	\$2,044.08	\$1,355.58	\$5,984.34	\$11,246.52	\$497.49	\$3,811.74	\$8,134.56	\$2,518.38
3	\$13,181.68	\$2,808.04	\$1,249.52	\$2,084.96	\$1,382.69	\$6,104.03	\$11,471.45	\$512.41	\$3,887.97	\$8,206.96	\$2,568.75
4	\$13,577.13	\$2,864.20	\$1,274.51	\$2,126.66	\$1,410.35	\$6,226.11	\$11,700.88	\$527.79	\$3,965.73	\$8,278.10	\$2,620.12
5	\$13,984.45	\$2,921.48	\$1,300.00	\$2,169.19	\$1,438.55	\$6,350.63	\$11,934.90	\$543.62	\$4,045.05	\$8,347.88	\$2,672.53
6	\$14,403.98	\$2,979.91	\$1,326.00	\$2,212.58	\$1,467.32	\$6,477.64	\$12,173.59	\$559.93	\$4,125.95	\$8,416.17	\$2,725.98
7	\$14,836.10	\$3,039.51	\$1,352.52	\$2,256.83	\$1,496.67	\$6,607.19	\$12,417.07	\$576.73	\$4,208.47	\$8,482.87	\$2,780.50
8	\$15,281.18	\$3,100.30	\$1,379.57	\$2,301.97	\$1,526.60	\$6,739.34	\$12,665.41	\$594.03	\$4,292.64	\$8,547.86	\$2,836.10
9	\$15,739.62	\$3,162.31	\$1,407.16	\$2,348.01	\$1,557.14	\$6,874.13	\$12,918.72	\$611.85	\$4,378.49	\$8,611.01	\$2,892.83
10	\$16,211.81	\$3,225.55	\$1,435.31	\$2,394.97	\$1,588.28	\$7,011.61	\$13,177.09	\$630.21	\$4,466.06	\$8,672.18	\$2,950.68
11	\$16,698.16	\$3,290.07	\$1,464.01	\$2,442.86	\$1,620.04	\$7,151.84	\$13,440.63	\$649.11	\$4,555.38	\$8,731.25	\$3,009.70
12	\$17,199.11	\$3,355.87	\$1,493.29	\$2,491.72	\$1,652.44	\$7,294.88	\$13,709.45	\$668.58	\$4,646.49	\$8,788.07	\$3,069.89
13	\$17,715.08	\$3,422.98	\$1,523.16	\$2,541.56	\$1,685.49	\$7,440.77	\$13,983.63	\$688.64	\$4,739.42	\$8,842.48	\$3,131.29
14	\$18,246.53	\$3,491.44	\$1,553.62	\$2,592.39	\$1,719.20	\$7,589.59	\$14,263.31	\$709.30	\$4,834.21	\$8,894.35	\$3,193.91
15	\$18,793.93	\$3,561.27	\$1,584.69	\$2,644.24	\$1,753.59	\$7,741.38	\$14,548.57	\$730.58	\$4,930.89	\$8,943.51	
16	\$19,357.75		\$1,616.39	\$2,697.12	\$1,788.66		\$14,839.54	\$752.50	\$5,029.51	\$8,989.78	
17	\$19,938.48		\$1,648.72	\$2,751.06	\$1,824.43		\$15,136.34	\$775.07	\$5,130.10	\$9,033.01	
18	\$20,536.63		\$1,681.69	\$2,806.08	\$1,860.92		\$15,439.06	\$798.33	\$5,232.70	\$9,073.00	
19	\$21,152.73		\$1,715.32	\$2,862.21	\$1,898.14		\$15,747.84	\$822.28	\$5,337.36	\$9,109.57	
20	\$21,787.31		\$1,749.63	\$2,919.45	\$1,936.10		\$16,062.80	\$846.94	\$5,444.10	\$9,142.53	
21			\$1,784.62	\$2,977.84	\$1,974.82		\$16,384.06	\$872.35	\$5,552.99	\$9,171.67	
22			\$1,820.32	\$3,037.40	\$2,014.32		\$16,711.74	\$898.52	\$5,664.05	\$9,196.78	
23			\$1,856.72	\$3,098.14	\$2,054.61		\$17,045.97	\$925.48	\$5,777.33	\$9,217.64	
24			\$1,893.86	\$3,160.11	\$2,095.70		\$17,386.89	\$953.24	\$5,892.87	\$9,234.02	

ECM	City Hall - Window Replacement	City Hall - Window Replacement with Insulated Spandrel Panel	Police Department - Window Replacement	Mancross Public Library - Envelope Improvements	Youth Services Main Building - Batt Installation
Assumed Inflation (Gas, Oil)	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas, Oil)	\$78.34	\$107.34	\$36.61	\$4,046.68	\$242.27
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$200.75	\$278.24	\$62.40	\$3,189.31	
Assumed Average Useful Life (Years)	20	20	20	30+	30+
Lifetime Savings	\$7,297.79	\$10,084.48	\$2,566.14	\$315,898.88	\$9,828.46
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$279.09	\$385.58	\$99.01	\$7,235.99	\$242.27
2	\$286.68	\$396.07	\$101.61	\$7,412.60	\$247.12
3	\$294.48	\$406.86	\$104.28	\$7,593.71	\$252.06
4	\$302.50	\$417.95	\$107.03	\$7,779.42	\$257.10
5	\$310.75	\$429.35	\$109.86	\$7,969.86	\$262.24
6	\$319.22	\$441.07	\$112.75	\$8,165.15	\$267.49
7	\$327.93	\$453.12	\$115.73	\$8,365.42	\$272.84
8	\$336.89	\$465.50	\$118.79	\$8,570.81	\$278.29
9	\$346.10	\$478.23	\$121.94	\$8,781.46	\$283.86
10	\$355.56	\$491.32	\$125.17	\$8,997.49	\$289.54
11	\$365.29	\$504.78	\$128.48	\$9,219.05	\$295.33
12	\$375.30	\$518.61	\$131.89	\$9,446.29	\$301.23
13	\$385.58	\$532.84	\$135.39	\$9,679.37	\$307.26
14	\$396.16	\$547.46	\$138.99	\$9,918.42	\$313.40
15	\$407.03	\$562.50	\$142.69	\$10,163.63	\$319.67
16	\$418.20	\$577.95	\$146.48	\$10,415.14	\$326.06
17	\$429.70	\$593.85	\$150.39	\$10,673.13	\$332.59
18	\$441.51	\$610.19	\$154.39	\$10,937.78	\$339.24
19	\$453.66	\$626.99	\$158.51	\$11,209.25	\$346.02
20	\$466.15	\$644.27	\$162.75	\$11,487.73	\$352.94
21				\$11,773.41	\$360.00
22				\$12,066.48	\$367.20
23				\$12,367.14	\$374.55
24				\$12,675.59	\$382.04
25				\$12,992.05	\$389.68
26				\$13,316.72	\$397.47
27				\$13,649.83	\$405.42
28				\$13,991.61	\$413.53
29				\$14,342.28	\$421.80
30				\$14,702.10	\$430.24

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades City Hall - Total		Lighting Upgrades City Hall Annex - Total		Lighting Upgrades Water Department - Main Office - Total		Lighting Upgrades Water Department - Garage - Total	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$10,595.72)	0	(\$1,158.22)	0	(\$9,170.50)	0	(\$6,540.81)
1	\$2,039.84	1	\$551.49	1	\$961.68	1	\$195.26
2	\$2,101.04	2	\$568.03	2	\$990.53	2	\$201.12
3	\$2,164.07	3	\$585.07	3	\$1,020.25	3	\$207.15
4	\$2,228.99	4	\$602.63	4	\$1,050.86	4	\$213.37
5	\$2,295.86	5	\$620.71	5	\$1,082.38	5	\$219.77
6	\$2,364.74	6	\$639.33	6	\$1,114.85	6	\$226.36
7	\$2,435.68	7	\$658.51	7	\$1,148.30	7	\$233.15
8	\$2,508.75	8	\$678.26	8	\$1,182.75	8	\$240.15
9	\$2,584.01	9	\$698.61	9	\$1,218.23	9	\$247.35
10	\$2,661.53	10	\$719.57	10	\$1,254.78	10	\$254.77
11	\$2,741.38	11	\$741.15	11	\$1,292.42	11	\$262.41
12	\$2,823.62	12	\$763.39	12	\$1,331.19	12	\$270.29
13	\$2,908.33	13	\$786.29	13	\$1,371.13	13	\$278.39
14	\$2,995.58	14	\$809.88	14	\$1,412.26	14	\$286.75
15	\$3,085.45	15	\$834.18	15	\$1,454.63	15	\$295.35
IRR	20.40%	IRR	50.45%	IRR	9.00%	IRR	-6.24%
NPV	\$19,110.76	NPV	\$6,873.17	NPV	\$4,834.57	NPV	(\$3,697.22)
ARO I	12.58%	ARO I	40.95%	ARO I	3.82%	ARO I	-3.68%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades City Hall - Interior		Lighting Upgrades City Hall Annex - Interior		Lighting Upgrades Water Department - Main Office - Interior		Lighting Upgrades Water Department - Garage - Interior	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$7,913.34)	0	(\$864.97)	0	(\$3,225.00)	0	(\$595.31)
1	\$1,473.79	1	\$73.36	1	\$773.16	1	\$15.38
2	\$1,518.00	2	\$75.57	2	\$796.35	2	\$15.84
3	\$1,563.54	3	\$77.83	3	\$820.24	3	\$16.32
4	\$1,610.45	4	\$80.17	4	\$844.85	4	\$16.80
5	\$1,658.76	5	\$82.57	5	\$870.19	5	\$17.31
6	\$1,708.52	6	\$85.05	6	\$896.30	6	\$17.83
7	\$1,759.78	7	\$87.60	7	\$923.19	7	\$18.36
8	\$1,812.57	8	\$90.23	8	\$950.89	8	\$18.91
9	\$1,866.95	9	\$92.94	9	\$979.41	9	\$19.48
10	\$1,922.96	10	\$95.72	10	\$1,008.79	10	\$20.07
11	\$1,980.65	11	\$98.60	11	\$1,039.06	11	\$20.67
12	\$2,040.07	12	\$101.55	12	\$1,070.23	12	\$21.29
13	\$2,101.27	13	\$104.60	13	\$1,102.34	13	\$21.93
14	\$2,164.31	14	\$107.74	14	\$1,135.41	14	\$22.58
15	\$2,229.24	15	\$110.97	15	\$1,169.47	15	\$23.26
IRR	19.66%	IRR	5.85%	IRR	25.78%	IRR	-7.61%
NPV	\$13,549.58	NPV	\$203.45	NPV	\$8,034.56	NPV	(\$371.35)
AROI	11.96%	AROI	1.82%	AROI	17.31%	AROI	-4.08%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades City Hall - Exterior		Lighting Upgrades City Hall Annex - Exterior		Lighting Upgrades Water Department - Main Office - Exterior		Lighting Upgrades Water Department - Garage - Exterior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$2,682.38)	0	(\$293.25)	0	(\$5,945.50)	0	(\$5,945.50)
1	\$566.06	1	\$478.12	1	\$188.52	1	\$179.88
2	\$583.04	2	\$492.47	2	\$194.18	2	\$185.28
3	\$600.53	3	\$507.24	3	\$200.01	3	\$190.84
4	\$618.55	4	\$522.46	4	\$206.01	4	\$196.56
5	\$637.10	5	\$538.13	5	\$212.19	5	\$202.46
6	\$656.22	6	\$554.28	6	\$218.55	6	\$208.53
7	\$675.90	7	\$570.91	7	\$225.11	7	\$214.79
8	\$696.18	8	\$588.03	8	\$231.86	8	\$221.23
9	\$717.06	9	\$605.67	9	\$238.82	9	\$227.87
10	\$738.58	10	\$623.84	10	\$245.98	10	\$234.70
11	\$760.73	11	\$642.56	11	\$253.36	11	\$241.75
12	\$783.56	12	\$661.84	12	\$260.96	12	\$249.00
13	\$807.06	13	\$681.69	13	\$268.79	13	\$256.47
14	\$831.27	14	\$702.14	14	\$276.85	14	\$264.16
15	\$856.21	15	\$723.21	15	\$285.16	15	\$272.09
IRR	22.55%	IRR	166.04%	IRR	-5.65%	IRR	-6.11%
NPV	\$5,561.18	NPV	\$6,669.73	NPV	(\$3,200.00)	NPV	(\$3,325.87)
AROI	14.44%	AROI	156.38%	AROI	-3.50%	AROI	-3.64%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Water Department - Water Filtration Plant - Total		Lighting Upgrades Water Department - High Service Pump Station - Total		Lighting Upgrades Water Department - #1 Well House - Total		Lighting Upgrades Water Department - #2 Well House - Total	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$15,191.66)	0	(\$1,630.13)	0	(\$1,874.91)	0	(\$743.19)
1	\$2,606.65	1	\$209.46	1	\$295.55	1	\$38.50
2	\$2,684.85	2	\$215.75	2	\$304.41	2	\$39.65
3	\$2,765.40	3	\$222.22	3	\$313.55	3	\$40.84
4	\$2,848.36	4	\$228.89	4	\$322.95	4	\$42.06
5	\$2,933.81	5	\$235.75	5	\$332.64	5	\$43.33
6	\$3,021.82	6	\$242.83	6	\$342.62	6	\$44.63
7	\$3,112.48	7	\$250.11	7	\$352.90	7	\$45.97
8	\$3,205.85	8	\$257.61	8	\$363.49	8	\$47.34
9	\$3,302.03	9	\$265.34	9	\$374.39	9	\$48.76
10	\$3,401.09	10	\$273.30	10	\$385.62	10	\$50.23
11	\$3,503.12	11	\$281.50	11	\$397.19	11	\$51.73
12	\$3,608.21	12	\$289.95	12	\$409.11	12	\$53.29
13	\$3,716.46	13	\$298.65	13	\$421.38	13	\$54.89
14	\$3,827.95	14	\$307.60	14	\$434.02	14	\$56.53
15	\$3,942.79	15	\$316.83	15	\$447.04	15	\$58.23
IRR	17.90%	IRR	12.37%	IRR	16.17%	IRR	-0.43%
NPV	\$22,769.27	NPV	\$1,420.32	NPV	\$2,429.19	NPV	(\$182.58)
AROI	10.49%	AROI	6.18%	AROI	9.10%	AROI	-1.49%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Water Department - Water Filtration Plant - Interior		Lighting Upgrades Water Department - High Service Pump Station - Interior		Lighting Upgrades Water Department - #1 Well House - Interior	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$1,779.78)	0	(\$143.75)	0	(\$1,131.73)
1	\$89.28	1	\$144.94	1	\$246.11
2	\$91.96	2	\$149.29	2	\$253.50
3	\$94.72	3	\$153.77	3	\$261.10
4	\$97.56	4	\$158.38	4	\$268.93
5	\$100.48	5	\$163.13	5	\$277.00
6	\$103.50	6	\$168.03	6	\$285.31
7	\$106.60	7	\$173.07	7	\$293.87
8	\$109.80	8	\$178.26	8	\$302.69
9	\$113.10	9	\$183.61	9	\$311.77
10	\$116.49	10	\$189.11	10	\$321.12
11	\$119.98	11	\$194.79	11	\$330.75
12	\$123.58	12	\$200.63	12	\$340.68
13	\$127.29	13	\$206.65	13	\$350.90
14	\$131.11	14	\$212.85	14	\$361.42
15	\$135.04	15	\$219.24	15	\$372.27
IRR	-0.80%	IRR	103.82%	IRR	23.28%
NPV	(\$479.61)	NPV	\$1,967.04	NPV	\$2,452.44
AROI	-1.65%	AROI	94.16%	AROI	15.08%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Water Department - Water Filtration Plant - Exterior		Lighting Upgrades Water Department - High Service Pump Station - Exterior		Lighting Upgrades Water Department - #1 Well House - Exterior		Lighting Upgrades Water Department - #2 Well House - Exterior	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$13,411.88)	0	(\$1,486.38)	0	(\$743.19)	0	(\$743.19)
1	\$2,517.37	1	\$64.52	1	\$49.44	1	\$37.41
2	\$2,592.89	2	\$66.46	2	\$50.92	2	\$38.54
3	\$2,670.68	3	\$68.45	3	\$52.45	3	\$39.69
4	\$2,750.80	4	\$70.51	4	\$54.02	4	\$40.88
5	\$2,833.32	5	\$72.62	5	\$55.64	5	\$42.11
6	\$2,918.32	6	\$74.80	6	\$57.31	6	\$43.37
7	\$3,005.87	7	\$77.04	7	\$59.03	7	\$44.68
8	\$3,096.05	8	\$79.36	8	\$60.80	8	\$46.02
9	\$3,188.93	9	\$81.74	9	\$62.62	9	\$47.40
10	\$3,284.60	10	\$84.19	10	\$64.50	10	\$48.82
11	\$3,383.14	11	\$86.71	11	\$66.44	11	\$50.28
12	\$3,484.63	12	\$89.32	12	\$68.43	12	\$51.79
13	\$3,589.17	13	\$91.99	13	\$70.48	13	\$53.34
14	\$3,696.85	14	\$94.75	14	\$72.60	14	\$54.94
15	\$3,807.75	15	\$97.60	15	\$74.78	15	\$56.59
IRR	19.83%	IRR	-2.41%	IRR	2.59%	IRR	-0.76%
NPV	\$23,248.88	NPV	(\$546.72)	NPV	(\$23.25)	NPV	(\$198.31)
AROI	12.10%	AROI	-2.33%	AROI	-0.01%	AROI	-1.63%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Water Department - #3 Well House - Total			Lighting Upgrades Water Department - #4 Well House - Total		
Life of ECRM (Yrs):		15	Life of ECRM (Yrs):		15
Year		Cash Flow	Year		Cash Flow
0		(\$71.88)	0		(\$71.88)
1		\$34.02	1		\$38.50
2		\$35.04	2		\$39.65
3		\$36.09	3		\$40.84
4		\$37.18	4		\$42.06
5		\$38.29	5		\$43.33
6		\$39.44	6		\$44.63
7		\$40.62	7		\$45.97
8		\$41.84	8		\$47.34
9		\$43.10	9		\$48.76
10		\$44.39	10		\$50.23
11		\$45.72	11		\$51.73
12		\$47.09	12		\$53.29
13		\$48.51	13		\$54.89
14		\$49.96	14		\$56.53
15		\$51.46	15		\$58.23
IRR		50.17%	IRR		56.46%
NPV		\$423.58	NPV		\$488.74
AROI		40.67%	AROI		46.89%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades		Lighting Upgrades	
Water Department - #3 Well House - Interior		Water Department - #4 Well House - Interior	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow
0	(\$71.88)	0	(\$71.88)
1	\$34.02	1	\$1.08
2	\$35.04	2	\$1.11
3	\$36.09	3	\$1.15
4	\$37.18	4	\$1.18
5	\$38.29	5	\$1.22
6	\$39.44	6	\$1.25
7	\$40.62	7	\$1.29
8	\$41.84	8	\$1.33
9	\$43.10	9	\$1.37
10	\$44.39	10	\$1.41
11	\$45.72	11	\$1.45
12	\$47.09	12	\$1.50
13	\$48.51	13	\$1.54
14	\$49.96	14	\$1.59
15	\$51.46	15	\$1.63
IRR	50.17%	IRR	-12.32%
NPV	\$423.58	NPV	(\$56.14)
AROI	40.67%	AROI	-5.16%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Water Department - #5 Well House - Total		Lighting Upgrades Water Department - Chemical and Control - Total		Lighting Upgrades Water Department - Chemical and Control 2 - Total		Lighting Upgrades Water Department - Generator - Total	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$815.06)	0	(\$941.63)	0	\$0.00	0	(\$1,479.60)
1	\$66.32	1	\$68.78	1	\$0.00	1	\$91.24
2	\$68.31	2	\$70.85	\$1.03	\$0.00	2	\$93.98
3	\$70.36	3	\$72.97	3	\$0.00	3	\$96.80
4	\$72.47	4	\$75.16	4	\$0.00	4	\$99.70
5	\$74.64	5	\$77.42	5	\$0.00	5	\$102.69
6	\$76.88	6	\$79.74	6	\$0.00	6	\$105.78
7	\$79.19	7	\$82.13	7	\$0.00	7	\$108.95
8	\$81.57	8	\$84.59	8	\$0.00	8	\$112.22
9	\$84.01	9	\$87.13	9	\$0.00	9	\$115.58
10	\$86.53	10	\$89.75	10	\$0.00	10	\$119.05
11	\$89.13	11	\$92.44	11	\$0.00	11	\$122.62
12	\$91.80	12	\$95.21	12	\$0.00	12	\$126.30
13	\$94.56	13	\$98.07	13	\$0.00	13	\$130.09
14	\$97.39	14	\$101.01	14	\$0.00	14	\$133.99
15	\$100.32	15	\$104.04	15	\$0.00	15	\$138.01
IRR	5.27%	IRR	3.81%	IRR	#NUM!	IRR	1.65%
NPV	\$150.78	NPV	\$60.06	NPV	\$0.00	NPV	(\$150.82)
AROI	1.47%	AROI	0.64%	AROI	#DIV/0!	AROI	-0.50%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Water Department - #5 Well House - Interior		Lighting Upgrades Water Department - Chemical and Control - Interior		Lighting Upgrades Water Department - Chemical and Control 2 - Interior		Lighting Upgrades Water Department - Generator - Interior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$71.88)	0	(\$198.44)	0	\$0.00	0	(\$736.41)
1	\$34.02	1	\$8.56	1	\$0.00	1	\$39.52
2	\$35.04	2	\$8.81	2	\$0.00	2	\$40.71
3	\$36.09	3	\$9.08	3	\$0.00	3	\$41.93
4	\$37.18	4	\$9.35	4	\$0.00	4	\$43.19
5	\$38.29	5	\$9.63	5	\$0.00	5	\$44.48
6	\$39.44	6	\$9.92	6	\$0.00	6	\$45.82
7	\$40.62	7	\$10.22	7	\$0.00	7	\$47.19
8	\$41.84	8	\$10.53	8	\$0.00	8	\$48.61
9	\$43.10	9	\$10.84	9	\$0.00	9	\$50.06
10	\$44.39	10	\$11.17	10	\$0.00	10	\$51.57
11	\$45.72	11	\$11.50	11	\$0.00	11	\$53.11
12	\$47.09	12	\$11.85	12	\$0.00	12	\$54.71
13	\$48.51	13	\$12.20	13	\$0.00	13	\$56.35
14	\$49.96	14	\$12.57	14	\$0.00	14	\$58.04
15	\$51.46	15	\$12.94	15	\$0.00	15	\$59.78
IRR	50.17%	IRR	-2.48%	IRR	#NUM!	IRR	-0.02%
NPV	\$423.58	NPV	(\$73.81)	NPV	\$0.00	NPV	(\$160.87)
AROI	40.67%	AROI	-2.35%	AROI	#DIV/0!	AROI	-1.30%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Water Department - #5 Well House - Exterior		Lighting Upgrades Water Department - Chemical and Control - Exterior		Lighting Upgrades Water Department - Chemical and Control 2 - Exterior		Lighting Upgrades Water Department - Generator - Exterior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$743.19)	0	(\$743.19)	0	\$0.00	0	(\$743.19)
1	\$32.30	1	\$60.22	1	\$0.00	1	\$51.72
2	\$33.27	2	\$62.03	2	\$0.00	2	\$53.27
3	\$34.27	3	\$63.89	3	\$0.00	3	\$54.87
4	\$35.29	4	\$65.81	4	\$0.00	4	\$56.52
5	\$36.35	5	\$67.78	5	\$0.00	5	\$58.21
6	\$37.44	6	\$69.82	6	\$0.00	6	\$59.96
7	\$38.57	7	\$71.91	7	\$0.00	7	\$61.76
8	\$39.72	8	\$74.07	8	\$0.00	8	\$63.61
9	\$40.92	9	\$76.29	9	\$0.00	9	\$65.52
10	\$42.14	10	\$78.58	10	\$0.00	10	\$67.49
11	\$43.41	11	\$80.94	11	\$0.00	11	\$69.51
12	\$44.71	12	\$83.37	12	\$0.00	12	\$71.60
13	\$46.05	13	\$85.87	13	\$0.00	13	\$73.74
14	\$47.43	14	\$88.44	14	\$0.00	14	\$75.96
15	\$48.86	15	\$91.10	15	\$0.00	15	\$78.23
IRR	-2.40%	IRR	5.21%	IRR	#NUM!	IRR	3.17%
NPV	(\$272.81)	NPV	\$133.87	NPV	\$0.00	NPV	\$10.05
AROI	-2.32%	AROI	1.44%	AROI	#DIV/0!	AROI	0.29%

IRR, NPV, AROI**Inflation Rate: 3%**

Lighting Upgrades Police Court - Total		Lighting Upgrades Parking Garage - Total	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow
0	(\$22,962.97)	0	(\$11,830.63)
1	\$5,701.88	1	\$0.00
2	\$5,872.94	2	\$0.00
3	\$6,049.13	3	\$0.00
4	\$6,230.60	4	\$0.00
5	\$6,417.52	5	\$0.00
6	\$6,610.04	6	\$0.00
7	\$6,808.35	7	\$0.00
8	\$7,012.60	8	\$0.00
9	\$7,222.97	9	\$0.00
10	\$7,439.66	10	\$0.00
11	\$7,662.85	11	\$0.00
12	\$7,892.74	12	\$0.00
13	\$8,129.52	13	\$0.00
14	\$8,373.41	14	\$0.00
15	\$8,624.61	15	\$0.00
IRR	26.72%	IRR	#NUM!
NPV	\$60,074.16	NPV	(\$11,830.63)
AROI	18.16%	AROI	-6.67%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Police Court - Interior		Lighting Upgrades Parking Garage - Interior	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow
0	(\$6,868.72)	0	\$0.00
1	\$2,713.22	1	\$0.00
2	\$2,794.61	2	\$0.00
3	\$2,878.45	3	\$0.00
4	\$2,964.80	4	\$0.00
5	\$3,053.75	5	\$0.00
6	\$3,145.36	6	\$0.00
7	\$3,239.72	7	\$0.00
8	\$3,336.91	8	\$0.00
9	\$3,437.02	9	\$0.00
10	\$3,540.13	10	\$0.00
11	\$3,646.34	11	\$0.00
12	\$3,755.73	12	\$0.00
13	\$3,868.40	13	\$0.00
14	\$3,984.45	14	\$0.00
15	\$4,103.98	15	\$0.00
IRR	42.19%	IRR	#NUM!
NPV	\$32,644.14	NPV	\$0.00
AROI	32.83%	AROI	#DIV/0!

IRR, NPV, AROI**Inflation Rate: 3%**

Lighting Upgrades		Lighting Upgrades	
Police Court - Exterior		Parking Garage - Exterior	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow
0	(\$16,094.25)	0	(\$11,830.63)
1	\$0.00	1	\$0.00
2	\$0.00	2	\$0.00
3	\$0.00	3	\$0.00
4	\$0.00	4	\$0.00
5	\$0.00	5	\$0.00
6	\$0.00	6	\$0.00
7	\$0.00	7	\$0.00
8	\$0.00	8	\$0.00
9	\$0.00	9	\$0.00
10	\$0.00	10	\$0.00
11	\$0.00	11	\$0.00
12	\$0.00	12	\$0.00
13	\$0.00	13	\$0.00
14	\$0.00	14	\$0.00
15	\$0.00	15	\$0.00
IRR	#NUM!	IRR	#NUM!
NPV	(\$16,094.25)	NPV	(\$11,830.63)
AROI	-6.67%	AROI	-6.67%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Parks and Recreation - Rockwell Park - Total		Lighting Upgrades Parks and Recreation - Rockwell Pavillion - Total		Lighting Upgrades Parks and Recreation - Bathhouse - Total		Lighting Upgrades Parks and Recreation - Muzzy Field - Total	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$7,590.02)	0	(\$1,048.78)	0	(\$1,318.19)	0	(\$12,389.10)
1	\$537.54	1	\$188.10	1	\$388.56	1	\$935.04
2	\$553.67	2	\$193.74	2	\$400.22	2	\$963.09
3	\$570.28	3	\$199.55	3	\$412.22	3	\$991.98
4	\$587.39	4	\$205.54	4	\$424.59	4	\$1,021.74
5	\$605.01	5	\$211.71	5	\$437.33	5	\$1,052.39
6	\$623.16	6	\$218.06	6	\$450.45	6	\$1,083.96
7	\$641.85	7	\$224.60	7	\$463.96	7	\$1,116.48
8	\$661.11	8	\$231.34	8	\$477.88	8	\$1,149.98
9	\$680.94	9	\$238.28	9	\$492.22	9	\$1,184.48
10	\$701.37	10	\$245.42	10	\$506.98	10	\$1,220.01
11	\$722.41	11	\$252.79	11	\$522.19	11	\$1,256.61
12	\$744.08	12	\$260.37	12	\$537.86	12	\$1,294.31
13	\$766.40	13	\$268.18	13	\$554.00	13	\$1,333.14
14	\$789.40	14	\$276.23	14	\$570.62	14	\$1,373.13
15	\$813.08	15	\$284.51	15	\$587.73	15	\$1,414.33
IRR	3.40%	IRR	18.84%	IRR	31.74%	IRR	4.24%
NPV	\$238.25	NPV	\$1,690.51	NPV	\$4,340.47	NPV	\$1,227.93
AROI	0.42%	AROI	11.27%	AROI	22.81%	AROI	0.88%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Parks and Recreation - Rockwell Park - Interior		Lighting Upgrades Parks and Recreation - Rockwell Pavillion - Interior		Lighting Upgrades Parks and Recreation - Bathhouse - Interior		Lighting Upgrades Parks and Recreation - Muzzy Field - Interior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$6,103.64)	0	(\$305.59)	0	(\$575.00)	0	(\$6,539.91)
1	\$522.51	1	\$59.19	1	\$327.11	1	\$510.19
2	\$538.19	2	\$60.97	2	\$336.92	2	\$525.49
3	\$554.34	3	\$62.80	3	\$347.03	3	\$541.26
4	\$570.97	4	\$64.68	4	\$357.44	4	\$557.50
5	\$588.09	5	\$66.62	5	\$368.16	5	\$574.22
6	\$605.74	6	\$68.62	6	\$379.21	6	\$591.45
7	\$623.91	7	\$70.68	7	\$390.58	7	\$609.19
8	\$642.63	8	\$72.80	8	\$402.30	8	\$627.47
9	\$661.91	9	\$74.98	9	\$414.37	9	\$646.29
10	\$681.76	10	\$77.23	10	\$426.80	10	\$665.68
11	\$702.22	11	\$79.55	11	\$439.60	11	\$685.65
12	\$723.28	12	\$81.94	12	\$452.79	12	\$706.22
13	\$744.98	13	\$84.40	13	\$466.37	13	\$727.41
14	\$767.33	14	\$86.93	14	\$480.37	14	\$749.23
15	\$790.35	15	\$89.54	15	\$494.78	15	\$771.70
IRR	5.98%	IRR	20.54%	IRR	59.81%	IRR	4.69%
NPV	\$1,505.78	NPV	\$556.45	NPV	\$4,188.67	NPV	\$890.00
AROI	1.89%	AROI	12.70%	AROI	50.22%	AROI	1.13%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Parks and Recreation - Rockwell Park - Exterior		Lighting Upgrades Parks and Recreation - Rockwell Pavillion - Exterior		Lighting Upgrades Parks and Recreation - Bathhouse - Exterior		Lighting Upgrades Parks and Recreation - Muzzy Field - Exterior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$1,486.38)	0	(\$743.19)	0	(\$743.19)	0	(\$5,849.19)
1	\$15.03	1	\$128.90	1	\$61.46	1	\$424.85
2	\$15.48	2	\$132.77	2	\$63.30	2	\$437.59
3	\$15.94	3	\$136.75	3	\$65.20	3	\$450.72
4	\$16.42	4	\$140.86	4	\$67.15	4	\$464.24
5	\$16.91	5	\$145.08	5	\$69.17	5	\$478.17
6	\$17.42	6	\$149.43	6	\$71.24	6	\$492.52
7	\$17.94	7	\$153.92	7	\$73.38	7	\$507.29
8	\$18.48	8	\$158.54	8	\$75.58	8	\$522.51
9	\$19.04	9	\$163.29	9	\$77.85	9	\$538.19
10	\$19.61	10	\$168.19	10	\$80.19	10	\$554.33
11	\$20.19	11	\$173.24	11	\$82.59	11	\$570.96
12	\$20.80	12	\$178.43	12	\$85.07	12	\$588.09
13	\$21.42	13	\$183.79	13	\$87.62	13	\$605.73
14	\$22.07	14	\$189.30	14	\$90.25	14	\$623.90
15	\$22.73	15	\$194.98	15	\$92.96	15	\$642.62
IRR	-15.42%	IRR	18.12%	IRR	5.49%	IRR	3.73%
NPV	(\$1,267.54)	NPV	\$1,134.05	NPV	\$151.80	NPV	\$337.93
AROI	-5.66%	AROI	10.68%	AROI	1.60%	AROI	0.60%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Parks and Recreation - Ski Lodge - Total		Lighting Upgrades Parks and Recreation - Page Park Pavillion - Total		Lighting Upgrades Parks and Recreation - Recreation Building - Total		Lighting Upgrades Bristol Fire - Fire HQ - Total	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$2,891.38)	0	(\$5,297.00)	0	(\$1,036.44)	0	(\$6,041.13)
1	\$135.35	1	\$348.63	1	\$408.25	1	\$256.38
2	\$139.41	2	\$359.09	2	\$420.50	2	\$264.07
3	\$143.60	3	\$369.87	3	\$433.11	3	\$271.99
4	\$147.90	4	\$380.96	4	\$446.11	4	\$280.15
5	\$152.34	5	\$392.39	5	\$459.49	5	\$288.55
6	\$156.91	6	\$404.16	6	\$473.27	6	\$297.21
7	\$161.62	7	\$416.29	7	\$487.47	7	\$306.13
8	\$166.47	8	\$428.78	8	\$502.10	8	\$315.31
9	\$171.46	9	\$441.64	9	\$517.16	9	\$324.77
10	\$176.61	10	\$454.89	10	\$532.67	10	\$334.51
11	\$181.90	11	\$468.54	11	\$548.65	11	\$344.55
12	\$187.36	12	\$482.59	12	\$565.11	12	\$354.88
13	\$192.98	13	\$497.07	13	\$582.07	13	\$365.53
14	\$198.77	14	\$511.98	14	\$599.53	14	\$376.50
15	\$204.74	15	\$527.34	15	\$617.52	15	\$387.79
IRR	-1.58%	IRR	2.46%	IRR	42.07%	IRR	-2.65%
NPV	(\$920.20)	NPV	(\$219.80)	NPV	\$4,908.95	NPV	(\$2,307.49)
AROI	-1.99%	AROI	-0.08%	AROI	32.72%	AROI	-2.42%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Parks and Recreation - Ski Lodge - Interior		Lighting Upgrades Parks and Recreation - Page Park Pavillion - Interior		Lighting Upgrades Parks and Recreation - Recreation Building - Interior		Lighting Upgrades Bristol Fire - Fire HQ - Interior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$1,405.00)	0	(\$3,810.63)	0	(\$293.25)	0	(\$1,582.00)
1	\$119.87	1	\$249.13	1	\$348.81	1	\$44.70
2	\$123.47	2	\$256.60	2	\$359.27	2	\$46.04
3	\$127.17	3	\$264.30	3	\$370.05	3	\$47.42
4	\$130.99	4	\$272.23	4	\$381.15	4	\$48.85
5	\$134.92	5	\$280.39	5	\$392.58	5	\$50.31
6	\$138.96	6	\$288.80	6	\$404.36	6	\$51.82
7	\$143.13	7	\$297.47	7	\$416.49	7	\$53.38
8	\$147.43	8	\$306.39	8	\$428.99	8	\$54.98
9	\$151.85	9	\$315.58	9	\$441.86	9	\$56.63
10	\$156.41	10	\$325.05	10	\$455.11	10	\$58.33
11	\$161.10	11	\$334.80	11	\$468.77	11	\$60.07
12	\$165.93	12	\$344.85	12	\$482.83	12	\$61.88
13	\$170.91	13	\$355.19	13	\$497.31	13	\$63.73
14	\$176.04	14	\$365.85	14	\$512.23	14	\$65.65
15	\$181.32	15	\$376.82	15	\$527.60	15	\$67.61
IRR	5.93%	IRR	2.37%	IRR	121.94%	IRR	-6.77%
NPV	\$340.71	NPV	(\$182.59)	NPV	\$4,786.45	NPV	(\$931.01)
AROI	1.87%	AROI	-0.13%	AROI	112.28%	AROI	-3.84%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Parks and Recreation - Ski Lodge - Exterior		Lighting Upgrades Parks and Recreation - Page Park Pavillion - Exterior		Lighting Upgrades Parks and Recreation - Recreation Building - Exterior		Lighting Upgrades Bristol Fire - Fire HQ - Exterior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$1,486.38)	0	(\$1,486.38)	0	(\$743.19)	0	(\$4,459.13)
1	\$15.48	1	\$180.17	1	\$176.32	1	\$278.10
2	\$15.95	2	\$185.57	2	\$181.61	2	\$286.45
3	\$16.43	3	\$191.14	3	\$187.06	3	\$295.04
4	\$16.92	4	\$196.87	4	\$192.67	4	\$303.89
5	\$17.43	5	\$202.78	5	\$198.45	5	\$313.01
6	\$17.95	6	\$208.86	6	\$204.40	6	\$322.40
7	\$18.49	7	\$215.13	7	\$210.53	7	\$332.07
8	\$19.04	8	\$221.58	8	\$216.85	8	\$342.03
9	\$19.61	9	\$228.23	9	\$223.35	9	\$352.29
10	\$20.20	10	\$235.08	10	\$230.05	10	\$362.86
11	\$20.81	11	\$242.13	11	\$236.96	11	\$373.75
12	\$21.43	12	\$249.39	12	\$244.06	12	\$384.96
13	\$22.07	13	\$256.88	13	\$251.39	13	\$396.51
14	\$22.74	14	\$264.58	14	\$258.93	14	\$408.41
15	\$23.42	15	\$272.52	15	\$266.70	15	\$420.66
IRR	-15.20%	IRR	11.36%	IRR	25.50%	IRR	1.79%
NPV	(\$1,260.91)	NPV	\$1,137.43	NPV	\$1,824.54	NPV	(\$409.05)
AROI	-5.63%	AROI	5.45%	AROI	17.06%	AROI	-0.43%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades			Lighting Upgrades		
Bristol Fire - Engine 2 - Total			Bristol Fire - Engine 3 - Total		
Life of ECRM (Yrs):		15	Life of ECRM (Yrs):		15
Year	Cash Flow		Year	Cash Flow	
0	(\$3,648.38)		0	(\$5,351.47)	
1	\$1,384.56		1	\$256.38	
2	\$1,426.09		2	\$264.07	
3	\$1,468.88		3	\$271.99	
4	\$1,512.94		4	\$280.15	
5	\$1,558.33		5	\$288.55	
6	\$1,605.08		6	\$297.21	
7	\$1,653.23		7	\$306.13	
8	\$1,702.83		8	\$315.31	
9	\$1,753.92		9	\$324.77	
10	\$1,806.53		10	\$334.51	
11	\$1,860.73		11	\$344.55	
12	\$1,916.55		12	\$354.88	
13	\$1,974.05		13	\$365.53	
14	\$2,033.27		14	\$376.50	
15	\$2,094.27		15	\$387.79	
IRR	40.59%		IRR	-1.32%	
NPV	\$16,515.09		NPV	(\$1,617.84)	
AROI	31.28%		AROI	-1.88%	

IRR, NPV, AROI**Inflation Rate: 3%**

Lighting Upgrades		Lighting Upgrades	
Bristol Fire - Engine 2 - Interior		Bristol Fire - Engine 3 - Interior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow
0	(\$71.88)	0	(\$880.84)
1	\$82.91	1	\$44.70
2	\$85.40	2	\$46.04
3	\$87.96	3	\$47.42
4	\$90.60	4	\$48.85
5	\$93.32	5	\$50.31
6	\$96.11	6	\$51.82
7	\$99.00	7	\$53.38
8	\$101.97	8	\$54.98
9	\$105.03	9	\$56.63
10	\$108.18	10	\$58.33
11	\$111.42	11	\$60.07
12	\$114.77	12	\$61.88
13	\$118.21	13	\$63.73
14	\$121.76	14	\$65.65
15	\$125.41	15	\$67.61
IRR	118.35%	IRR	-0.67%
NPV	\$1,135.54	NPV	(\$229.85)
AROI	108.69%	AROI	-1.59%

IRR, NPV, AROI**Inflation Rate: 3%**

Lighting Upgrades		Lighting Upgrades	
Bristol Fire - Engine 2 - Exterior		Bristol Fire - Engine 3 - Exterior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow
0	(\$3,576.50)	0	(\$4,470.63)
1	\$176.32	1	\$278.10
2	\$181.61	2	\$286.45
3	\$187.06	3	\$295.04
4	\$192.67	4	\$303.89
5	\$198.45	5	\$313.01
6	\$204.40	6	\$322.40
7	\$210.53	7	\$332.07
8	\$216.85	8	\$342.03
9	\$223.35	9	\$352.29
10	\$230.05	10	\$362.86
11	\$236.96	11	\$373.75
12	\$244.06	12	\$384.96
13	\$251.39	13	\$396.51
14	\$258.93	14	\$408.41
15	\$266.70	15	\$420.66
IRR	-1.00%	IRR	1.75%
NPV	(\$1,008.77)	NPV	(\$420.55)
AROI	-1.74%	AROI	-0.45%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Bristol Fire - Engine 4 - Total		Lighting Upgrades Bristol Fire - Engine 5 - Total		Lighting Upgrades Senior Center - Total		Lighting Upgrades Main Library - Total	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$5,669.75)	0	(\$6,087.47)	0	(\$20,743.03)	0	(\$6,520.56)
1	\$271.59	1	\$2,229.56	1	\$1,331.52	1	\$318.33
2	\$279.73	2	\$2,296.45	2	\$1,371.46	2	\$327.88
3	\$288.13	3	\$2,365.34	3	\$1,412.60	3	\$337.71
4	\$296.77	4	\$2,436.30	4	\$1,454.98	4	\$347.85
5	\$305.67	5	\$2,509.39	5	\$1,498.63	5	\$358.28
6	\$314.84	6	\$2,584.67	6	\$1,543.59	6	\$369.03
7	\$324.29	7	\$2,662.21	7	\$1,589.90	7	\$380.10
8	\$334.02	8	\$2,742.08	8	\$1,637.60	8	\$391.50
9	\$344.04	9	\$2,824.34	9	\$1,686.72	9	\$403.25
10	\$354.36	10	\$2,909.07	10	\$1,737.33	10	\$415.35
11	\$364.99	11	\$2,996.34	11	\$1,789.45	11	\$427.81
12	\$375.94	12	\$3,086.23	12	\$1,843.13	12	\$440.64
13	\$387.22	13	\$3,178.82	13	\$1,898.42	13	\$453.86
14	\$398.83	14	\$3,274.19	14	\$1,955.38	14	\$467.48
15	\$410.80	15	\$3,372.41	15	\$2,014.04	15	\$481.50
IRR	-1.32%	IRR	39.23%	IRR	2.14%	IRR	-1.11%
NPV	(\$1,714.60)	NPV	\$26,381.87	NPV	(\$1,352.03)	NPV	(\$1,884.71)
AROI	-1.88%	AROI	29.96%	AROI	-0.25%	AROI	-1.78%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Bristol Fire - Engine 4 - Interior		Lighting Upgrades Bristol Fire - Engine 5 - Interior		Lighting Upgrades Senior Center - Interior		Lighting Upgrades Main Library - Interior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$467.44)	0	(\$1,024.59)	0	(\$1,348.28)	0	(\$2,804.63)
1	\$4.32	1	\$701.56	1	\$209.37	1	\$75.56
2	\$4.45	2	\$722.61	2	\$215.65	2	\$77.82
3	\$4.59	3	\$744.29	3	\$222.12	3	\$80.16
4	\$4.72	4	\$766.62	4	\$228.78	4	\$82.56
5	\$4.87	5	\$789.61	5	\$235.65	5	\$85.04
6	\$5.01	6	\$813.30	6	\$242.72	6	\$87.59
7	\$5.16	7	\$837.70	7	\$250.00	7	\$90.22
8	\$5.32	8	\$862.83	8	\$257.50	8	\$92.92
9	\$5.48	9	\$888.72	9	\$265.22	9	\$95.71
10	\$5.64	10	\$915.38	10	\$273.18	10	\$98.58
11	\$5.81	11	\$942.84	11	\$281.38	11	\$101.54
12	\$5.98	12	\$971.13	12	\$289.82	12	\$104.59
13	\$6.16	13	\$1,000.26	13	\$298.51	13	\$107.73
14	\$6.35	14	\$1,030.27	14	\$307.47	14	\$110.96
15	\$6.54	15	\$1,061.18	15	\$316.69	15	\$114.29
IRR	-16.09%	IRR	71.44%	IRR	15.87%	IRR	-7.22%
NPV	(\$404.47)	NPV	\$9,192.34	NPV	\$1,700.79	NPV	(\$1,704.29)
AROI	-5.74%	AROI	61.81%	AROI	8.86%	AROI	-3.97%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Bristol Fire - Engine 4 - Exterior		Lighting Upgrades Bristol Fire - Engine 5 - Exterior		Lighting Upgrades Senior Center - Exterior		Lighting Upgrades Main Library - Exterior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$5,202.31)	0	(\$5,062.88)	0	(\$19,394.75)	0	(\$3,715.94)
1	\$267.26	1	\$1,528.00	1	\$1,122.15	1	\$242.77
2	\$275.28	2	\$1,573.84	2	\$1,155.81	2	\$250.06
3	\$283.54	3	\$1,621.05	3	\$1,190.48	3	\$257.56
4	\$292.05	4	\$1,669.69	4	\$1,226.20	4	\$265.28
5	\$300.81	5	\$1,719.78	5	\$1,262.98	5	\$273.24
6	\$309.83	6	\$1,771.37	6	\$1,300.87	6	\$281.44
7	\$319.13	7	\$1,824.51	7	\$1,339.90	7	\$289.88
8	\$328.70	8	\$1,879.25	8	\$1,380.10	8	\$298.58
9	\$338.56	9	\$1,935.62	9	\$1,421.50	9	\$307.54
10	\$348.72	10	\$1,993.69	10	\$1,464.15	10	\$316.76
11	\$359.18	11	\$2,053.50	11	\$1,508.07	11	\$326.27
12	\$369.95	12	\$2,115.11	12	\$1,553.31	12	\$336.05
13	\$381.05	13	\$2,178.56	13	\$1,599.91	13	\$346.13
14	\$392.49	14	\$2,243.92	14	\$1,647.91	14	\$356.52
15	\$404.26	15	\$2,311.23	15	\$1,697.35	15	\$367.21
IRR	-0.53%	IRR	32.49%	IRR	0.87%	IRR	2.37%
NPV	(\$1,310.13)	NPV	\$17,189.53	NPV	(\$3,052.82)	NPV	(\$180.42)
AROI	-1.53%	AROI	23.51%	AROI	-0.88%	AROI	-0.13%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Public Library - Total		Lighting Upgrades Youth Services - Main Building - Total		Lighting Upgrades Public Works - Animal Control - Total		Lighting Upgrades Public Works - Community - Total	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$4,542.75)	0	(\$3,380.06)	0	(\$976.91)	0	(\$503.38)
1	\$548.80	1	\$374.81	1	\$2.47	1	\$33.62
2	\$565.27	2	\$386.05	2	\$2.54	2	\$34.62
3	\$582.22	3	\$397.63	3	\$2.62	3	\$35.66
4	\$599.69	4	\$409.56	4	\$2.70	4	\$36.73
5	\$617.68	5	\$421.85	5	\$2.78	5	\$37.84
6	\$636.21	6	\$434.50	6	\$2.86	6	\$38.97
7	\$655.30	7	\$447.54	7	\$2.95	7	\$40.14
8	\$674.96	8	\$460.96	8	\$3.03	8	\$41.34
9	\$695.21	9	\$474.79	9	\$3.13	9	\$42.58
10	\$716.06	10	\$489.04	10	\$3.22	10	\$43.86
11	\$737.54	11	\$503.71	11	\$3.32	11	\$45.18
12	\$759.67	12	\$518.82	12	\$3.42	12	\$46.53
13	\$782.46	13	\$534.38	13	\$3.52	13	\$47.93
14	\$805.93	14	\$550.41	14	\$3.62	14	\$49.37
15	\$830.11	15	\$566.93	15	\$3.73	15	\$50.85
IRR	11.31%	IRR	9.89%	IRR	#DIV/0!	IRR	2.64%
NPV	\$3,449.52	NPV	\$2,078.27	NPV	(\$940.98)	NPV	(\$13.82)
AROI	5.41%	AROI	4.42%	AROI	-6.41%	AROI	0.01%

IRR, NPV, AROI**Inflation Rate: 3%**

Lighting Upgrades Public Library - Interior		Lighting Upgrades Youth Services - Main Building - Interior		Lighting Upgrades Public Works - Animal Control - Interior		Lighting Upgrades Public Works - Community - Interior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$683.06)	0	(\$1,150.50)	0	(\$233.72)	0	(\$503.38)
1	\$209.31	1	\$189.79	1	\$1.37	1	\$33.62
2	\$215.59	2	\$195.48	2	\$1.41	2	\$34.62
3	\$222.06	3	\$201.34	3	\$1.45	3	\$35.66
4	\$228.72	4	\$207.38	4	\$1.50	4	\$36.73
5	\$235.59	5	\$213.61	5	\$1.54	5	\$37.84
6	\$242.65	6	\$220.01	6	\$1.59	6	\$38.97
7	\$249.93	7	\$226.62	7	\$1.63	7	\$40.14
8	\$257.43	8	\$233.41	8	\$1.68	8	\$41.34
9	\$265.15	9	\$240.42	9	\$1.73	9	\$42.58
10	\$273.11	10	\$247.63	10	\$1.79	10	\$43.86
11	\$281.30	11	\$255.06	11	\$1.84	11	\$45.18
12	\$289.74	12	\$262.71	12	\$1.89	12	\$46.53
13	\$298.43	13	\$270.59	13	\$1.95	13	\$47.93
14	\$307.39	14	\$278.71	14	\$2.01	14	\$49.37
15	\$316.61	15	\$287.07	15	\$2.07	15	\$50.85
IRR	32.98%	IRR	17.08%	IRR	-19.34%	IRR	2.64%
NPV	\$2,365.21	NPV	\$1,613.38	NPV	(\$213.78)	NPV	(\$13.82)
AROI	23.98%	AROI	9.83%	AROI	-6.08%	AROI	0.01%

IRR, NPV, AROI**Inflation Rate: 3%**

Lighting Upgrades Public Library - Exterior		Lighting Upgrades Youth Services - Main Building - Exterior		Lighting Upgrades Public Works - Animal Control - Exterior		Lighting Upgrades Public Works - Community - Exterior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$3,859.69)	0	(\$2,229.56)	0	(\$743.19)	0	\$0.00
1	\$339.49	1	\$185.02	1	\$1.10	1	\$26.57
2	\$349.67	2	\$190.57	2	\$1.13	2	\$27.37
3	\$360.16	3	\$196.29	3	\$1.17	3	\$28.19
4	\$370.97	4	\$202.18	4	\$1.20	4	\$29.04
5	\$382.10	5	\$208.24	5	\$1.24	5	\$29.91
6	\$393.56	6	\$214.49	6	\$1.27	6	\$30.80
7	\$405.37	7	\$220.92	7	\$1.31	7	\$31.73
8	\$417.53	8	\$227.55	8	\$1.35	8	\$32.68
9	\$430.05	9	\$234.38	9	\$1.39	9	\$33.66
10	\$442.95	10	\$241.41	10	\$1.43	10	\$34.67
11	\$456.24	11	\$248.65	11	\$1.48	11	\$35.71
12	\$469.93	12	\$256.11	12	\$1.52	12	\$36.78
13	\$484.03	13	\$263.79	13	\$1.57	13	\$37.89
14	\$498.55	14	\$271.71	14	\$1.61	14	\$39.02
15	\$513.51	15	\$279.86	15	\$1.66	15	\$40.19
IRR	6.37%	IRR	5.54%	IRR	-27.89%	IRR	#DIV/0!
NPV	\$1,084.30	NPV	\$464.89	NPV	(\$727.19)	NPV	\$386.97
AROI	2.13%	AROI	1.63%	AROI	-6.52%	AROI	#DIV/0!

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Public Works - Hill Street - Total		Lighting Upgrades Public Works - City Yard - Total	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow
0	(\$4,709.10)	0	(\$12,864.19)
1	\$1,290.84	1	\$33.62
2	\$1,329.57	2	\$34.62
3	\$1,369.45	3	\$35.66
4	\$1,410.54	4	\$36.73
5	\$1,452.85	5	\$37.84
6	\$1,496.44	6	\$38.97
7	\$1,541.33	7	\$40.14
8	\$1,587.57	8	\$41.34
9	\$1,635.20	9	\$42.58
10	\$1,684.26	10	\$43.86
11	\$1,734.78	11	\$45.18
12	\$1,786.83	12	\$46.53
13	\$1,840.43	13	\$47.93
14	\$1,895.65	14	\$49.37
15	\$1,952.52	15	\$50.85
IRR	29.53%	IRR	-24.54%
NPV	\$14,089.58	NPV	(\$12,374.63)
AROI	20.74%	AROI	-6.41%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades

Public Works - Hill Street - Interior

Life of ECRM (Yrs): 15

Year	Cash Flow
0	(\$3,965.91)
1	\$841.93
2	\$867.19
3	\$893.20
4	\$920.00
5	\$947.60
6	\$976.02
7	\$1,005.31
8	\$1,035.46
9	\$1,066.53
10	\$1,098.52
11	\$1,131.48
12	\$1,165.42
13	\$1,200.39
14	\$1,236.40
15	\$1,273.49

IRR	22.69%
NPV	\$8,295.17
AROI	14.56%

IRR, NPV, AROI**Inflation Rate: 3%**

Lighting Upgrades Public Works - Hill Street - Exterior		Lighting Upgrades Public Works - City Yard - Exterior	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow
0	(\$743.19)	0	(\$12,864.19)
1	\$1.10	1	\$26.57
2	\$1.13	2	\$27.37
3	\$1.17	3	\$28.19
4	\$1.20	4	\$29.04
5	\$1.24	5	\$29.91
6	\$1.27	6	\$30.80
7	\$1.31	7	\$31.73
8	\$1.35	8	\$32.68
9	\$1.39	9	\$33.66
10	\$1.43	10	\$34.67
11	\$1.48	11	\$35.71
12	\$1.52	12	\$36.78
13	\$1.57	13	\$37.89
14	\$1.61	14	\$39.02
15	\$1.66	15	\$40.19
IRR	-27.89%	IRR	-25.95%
NPV	(\$727.19)	NPV	(\$12,477.22)
AROI	-6.52%	AROI	-6.46%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Public Works - Transfer Station Scale House - Total		Lighting Upgrades Public Works - Transfer Station Hut - Total		Lighting Upgrades Water Pollution Control - Operations- Total		Lighting Upgrades Water Pollution Control - Headworks - Total	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$2,229.56)	0	(\$4,854.44)	0	(\$35.94)	0	(\$1,486.38)
1	\$165.55	1	\$2,009.97	1	\$16.91	1	\$62.79
2	\$170.52	2	\$2,070.27	2	\$17.41	2	\$64.67
3	\$175.63	3	\$2,132.38	3	\$17.93	3	\$66.61
4	\$180.90	4	\$2,196.35	4	\$18.47	4	\$68.61
5	\$186.33	5	\$2,262.24	5	\$19.03	5	\$70.67
6	\$191.92	6	\$2,330.11	6	\$19.60	6	\$72.79
7	\$197.68	7	\$2,400.01	7	\$20.19	7	\$74.97
8	\$203.61	8	\$2,472.01	8	\$20.79	8	\$77.22
9	\$209.72	9	\$2,546.17	9	\$21.41	9	\$79.54
10	\$216.01	10	\$2,622.56	10	\$22.06	10	\$81.92
11	\$222.49	11	\$2,701.23	11	\$22.72	11	\$84.38
12	\$229.16	12	\$2,782.27	12	\$23.40	12	\$86.91
13	\$236.04	13	\$2,865.74	13	\$24.10	13	\$89.52
14	\$243.12	14	\$2,951.71	14	\$24.83	14	\$92.20
15	\$250.41	15	\$3,040.26	15	\$25.57	15	\$94.97
IRR	4.02%	IRR	44.14%	IRR	49.87%	IRR	-2.70%
NPV	\$181.39	NPV	\$24,416.97	NPV	\$210.25	NPV	(\$572.02)
AROI	0.76%	AROI	34.74%	AROI	40.37%	AROI	-2.44%
Lighting Upgrades Public Works - Transfer Station Hut - Interior		Lighting Upgrades Water Pollution Control - Operations - Interior					
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15					
Year	Cash Flow	Year	Cash Flow				
0	(\$3,217.13)	0	(\$35.94)				
1	\$1,456.06	1	\$16.91				
2	\$1,499.74	2	\$17.41				
3	\$1,544.74	3	\$17.93				
4	\$1,591.08	4	\$18.47				
5	\$1,638.81	5	\$19.03				
6	\$1,687.98	6	\$19.60				
7	\$1,738.61	7	\$20.19				
8	\$1,790.77	8	\$20.79				
9	\$1,844.50	9	\$21.41				
10	\$1,899.83	10	\$22.06				
11	\$1,956.83	11	\$22.72				
12	\$2,015.53	12	\$23.40				
13	\$2,076.00	13	\$24.10				
14	\$2,138.28	14	\$24.83				
15	\$2,202.42	15	\$25.57				
IRR	48.06%	IRR	49.87%				
NPV	\$17,987.66	NPV	\$210.25				
AROI	38.59%	AROI	40.37%				

IRR, NPV, AROI

Inflation Rate:		3%	
Lighting Upgrades		Lighting Upgrades	
Public Works - Transfer Station Scale House - Exterior		Public Works - Transfer Station Hut - Exterior	
Life of ECRM (Yrs):		Life of ECRM (Yrs):	
15		15	
Year	Cash Flow	Year	Cash Flow
0	(\$2,229.56)	0	(\$1,637.31)
1	\$165.55	1	\$553.91
2	\$170.52	2	\$570.53
3	\$175.63	3	\$587.64
4	\$180.90	4	\$605.27
5	\$186.33	5	\$623.43
6	\$191.92	6	\$642.13
7	\$197.68	7	\$661.40
8	\$203.61	8	\$681.24
9	\$209.72	9	\$701.67
10	\$216.01	10	\$722.72
11	\$222.49	11	\$744.41
12	\$229.16	12	\$766.74
13	\$236.04	13	\$789.74
14	\$243.12	14	\$813.43
15	\$250.41	15	\$837.84
IRR	4.02%	IRR	36.33%
NPV	\$181.39	NPV	\$6,429.31
AROI	0.76%	AROI	27.16%
Lighting Upgrades		Lighting Upgrades	
Water Pollution Control - Headworks - Exterior		Water Pollution Control - Air Blower - Exterior	
Life of ECRM (Yrs):		Life of ECRM (Yrs):	
15		15	
Year	Cash Flow	Year	Cash Flow
0	(\$1,486.38)	0	(\$2,229.56)
1	\$62.79	1	\$93.08
2	\$64.67	2	\$95.88
3	\$66.61	3	\$98.75
4	\$68.61	4	\$101.72
5	\$70.67	5	\$104.77
6	\$72.79	6	\$107.91
7	\$74.97	7	\$111.15
8	\$77.22	8	\$114.48
9	\$79.54	9	\$117.92
10	\$81.92	10	\$121.45
11	\$84.38	11	\$125.10
12	\$86.91	12	\$128.85
13	\$89.52	13	\$132.72
14	\$92.20	14	\$136.70
15	\$94.97	15	\$140.80
IRR	-2.70%	IRR	-2.83%
NPV	(\$572.02)	NPV	(\$873.97)
AROI	-2.44%	AROI	-2.49%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Water Pollution Control - Air Blower - Total		Lighting Upgrades Water Pollution Control - Pump House - Total		Lighting Upgrades Water Pollution Control - Sludge Thickening Building - Total	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$2,229.56)	0	(\$1,486.38)	0	(\$3,425.56)
1	\$94.18	1	\$62.79	1	\$94.18
2	\$97.00	2	\$64.67	2	\$97.00
3	\$99.91	3	\$66.61	3	\$99.91
4	\$102.91	4	\$68.61	4	\$102.91
5	\$106.00	5	\$70.67	5	\$106.00
6	\$109.18	6	\$72.79	6	\$109.18
7	\$112.45	7	\$74.97	7	\$112.45
8	\$115.83	8	\$77.22	8	\$115.83
9	\$119.30	9	\$79.54	9	\$119.30
10	\$122.88	10	\$81.92	10	\$122.88
11	\$126.57	11	\$84.38	11	\$126.57
12	\$130.37	12	\$86.91	12	\$130.37
13	\$134.28	13	\$89.52	13	\$134.28
14	\$138.30	14	\$92.20	14	\$138.30
15	\$142.45	15	\$94.97	15	\$142.45
IRR	-2.70%	IRR	-2.70%	IRR	-7.03%
NPV	(\$858.03)	NPV	(\$572.02)	NPV	(\$2,054.03)
AROI	-2.44%	AROI	-2.44%	AROI	-3.92%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Water Pollution Control - Sludge Disposal - Total		Lighting Upgrades Water Pollution Control - Broad Street PS - Total		Lighting Upgrades Water Pollution Control - Cherry Hill PS - Total		Lighting Upgrades Water Pollution Control - Cross PS - Total	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	\$0.00	0	(\$396.88)	0	(\$396.88)	0	(\$793.75)
1	\$0.00	1	\$6.74	1	\$6.88	1	\$13.56
2	\$0.00	2	\$6.94	2	\$7.09	2	\$13.97
3	\$0.00	3	\$7.15	3	\$7.30	3	\$14.39
4	\$0.00	4	\$7.37	4	\$7.52	4	\$14.82
5	\$0.00	5	\$7.59	5	\$7.75	5	\$15.26
6	\$0.00	6	\$7.81	6	\$7.98	6	\$15.72
7	\$0.00	7	\$8.05	7	\$8.22	7	\$16.19
8	\$0.00	8	\$8.29	8	\$8.47	8	\$16.68
9	\$0.00	9	\$8.54	9	\$8.72	9	\$17.18
10	\$0.00	10	\$8.79	10	\$8.98	10	\$17.69
11	\$0.00	11	\$9.06	11	\$9.25	11	\$18.22
12	\$0.00	12	\$9.33	12	\$9.53	12	\$18.77
13	\$0.00	13	\$9.61	13	\$9.82	13	\$19.33
14	\$0.00	14	\$9.90	14	\$10.11	14	\$19.91
15	\$0.00	15	\$10.20	15	\$10.41	15	\$20.51
IRR	#NUM!	IRR	-11.31%	IRR	-11.13%	IRR	-11.26%
NPV	\$0.00	NPV	(\$298.71)	NPV	(\$296.62)	NPV	(\$596.27)
AROI	#DIV/0!	AROI	-4.97%	AROI	-4.93%	AROI	-4.96%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Water Pollution Control - Drayla PS - Total		Lighting Upgrades Water Pollution Control - East Main PS - Total		Lighting Upgrades Water Pollution Control - Ivy PS - Total	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$793.75)	0	(\$198.44)	0	(\$198.44)
1	\$21.27	1	\$3.39	1	\$3.38
2	\$21.90	2	\$3.49	2	\$3.48
3	\$22.56	3	\$3.60	3	\$3.58
4	\$23.24	4	\$3.71	4	\$3.69
5	\$23.93	5	\$3.82	5	\$3.80
6	\$24.65	6	\$3.93	6	\$3.92
7	\$25.39	7	\$4.05	7	\$4.03
8	\$26.15	8	\$4.17	8	\$4.16
9	\$26.94	9	\$4.30	9	\$4.28
10	\$27.75	10	\$4.43	10	\$4.41
11	\$28.58	11	\$4.56	11	\$4.54
12	\$29.44	12	\$4.70	12	\$4.68
13	\$30.32	13	\$4.84	13	\$4.82
14	\$31.23	14	\$4.98	14	\$4.96
15	\$32.17	15	\$5.13	15	\$5.11
IRR	-7.27%	IRR	-11.25%	IRR	-11.29%
NPV	(\$484.06)	NPV	(\$149.04)	NPV	(\$149.24)
AROI	-3.99%	AROI	-4.96%	AROI	-4.96%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades Water Pollution Control - Julia PS - Total		Lighting Upgrades Water Pollution Control - Lake PS - Total		Lighting Upgrades Water Pollution Control - Lufkin PS - Total	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$198.44)	0	(\$198.44)	0	(\$198.44)
1	\$3.37	1	\$3.51	1	\$3.37
2	\$3.47	2	\$3.62	2	\$3.47
3	\$3.58	3	\$3.73	3	\$3.58
4	\$3.68	4	\$3.84	4	\$3.68
5	\$3.79	5	\$3.95	5	\$3.79
6	\$3.91	6	\$4.07	6	\$3.91
7	\$4.03	7	\$4.19	7	\$4.03
8	\$4.15	8	\$4.32	8	\$4.15
9	\$4.27	9	\$4.45	9	\$4.27
10	\$4.40	10	\$4.58	10	\$4.40
11	\$4.53	11	\$4.72	11	\$4.53
12	\$4.67	12	\$4.86	12	\$4.67
13	\$4.81	13	\$5.01	13	\$4.81
14	\$4.95	14	\$5.16	14	\$4.95
15	\$5.10	15	\$5.31	15	\$5.10
IRR	-11.31%	IRR	-10.96%	IRR	-11.31%
NPV	(\$149.35)	NPV	(\$147.29)	NPV	(\$149.35)
AROI	-4.97%	AROI	-4.90%	AROI	-4.97%

IRR, NPV, AROI**Inflation Rate: 3%**

Lighting Upgrades		Lighting Upgrades	
Water Pollution Control - Matthews PS - Total		Water Pollution Control - Middle PS - Total	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow
0	(\$595.31)	0	(\$595.31)
1	\$10.18	1	\$10.22
2	\$10.48	2	\$10.53
3	\$10.80	3	\$10.85
4	\$11.12	4	\$11.17
5	\$11.46	5	\$11.51
6	\$11.80	6	\$11.85
7	\$12.15	7	\$12.21
8	\$12.52	8	\$12.58
9	\$12.89	9	\$12.95
10	\$13.28	10	\$13.34
11	\$13.68	11	\$13.74
12	\$14.09	12	\$14.15
13	\$14.51	13	\$14.58
14	\$14.95	14	\$15.02
15	\$15.40	15	\$15.47
IRR	-11.25%	IRR	-11.21%
NPV	(\$447.07)	NPV	(\$446.41)
AROI	-4.96%	AROI	-4.95%

IRR, NPV, AROI**Inflation Rate: 3%**

Lighting Upgrades Water Pollution Control - Minor PS - Total		Lighting Upgrades Water Pollution Control - Boivin PS - Total	
Life of ECRM (Yrs):	15	Life of ECRM (Yrs):	15
Year	Cash Flow	Year	Cash Flow
0	(\$595.31)	0	(\$396.88)
1	\$10.14	1	\$6.77
2	\$10.44	2	\$6.97
3	\$10.76	3	\$7.18
4	\$11.08	4	\$7.39
5	\$11.41	5	\$7.62
6	\$11.76	6	\$7.84
7	\$12.11	7	\$8.08
8	\$12.47	8	\$8.32
9	\$12.85	9	\$8.57
10	\$13.23	10	\$8.83
11	\$13.63	11	\$9.09
12	\$14.04	12	\$9.37
13	\$14.46	13	\$9.65
14	\$14.89	14	\$9.94
15	\$15.34	15	\$10.23
IRR	-11.28%	IRR	-11.27%
NPV	(\$447.63)	NPV	(\$298.33)
AROI	-4.96%	AROI	-4.96%

IRR, NPV, AROI

Inflation Rate: 3%

Lighting Upgrades	
Water Pollution Control - Tyler PS - Total	
Life of ECRM (Yrs):	15
Year	Cash Flow
0	(\$595.31)
1	\$10.23
2	\$10.53
3	\$10.85
4	\$11.17
5	\$11.51
6	\$11.85
7	\$12.21
8	\$12.58
9	\$12.95
10	\$13.34
11	\$13.74
12	\$14.16
13	\$14.58
14	\$15.02
15	\$15.47
IRR	-11.21%
NPV	(\$446.39)
AROI	-4.95%

	City Hall - Total	City Hall Annex - Total	Water Department - Main Office - Total	Water Department - Garage - Total	Water Department - Water Filtration Plant - Total	Water Department - High Service Pump Station - Total	Water Department - #1 Well House - Total	Water Department - #2 Well House - Total	Water Department - #3 Well House - Total	Water Department - #4 Well House - Total
ECM										
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)										
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$1,304.88	\$492.23	\$669.99	\$186.08	\$2,534.67	\$154.86	\$136.08	\$37.41	\$7.45	\$7.45
Assumed Average Useful Life (Years)	15	15	15	15	15	15	15	15	15	15
Lifetime Savings	\$24,269.41	\$9,154.87	\$12,461.05	\$3,460.80	\$47,142.15	\$2,880.23	\$2,530.85	\$695.88	\$138.55	\$138.55
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	\$1,304.88	\$492.23	\$669.99	\$186.08	\$2,534.67	\$154.86	\$136.08	\$37.41	\$7.45	\$7.45
2	\$1,344.03	\$506.99	\$690.09	\$191.66	\$2,610.71	\$159.51	\$140.16	\$38.54	\$7.67	\$7.67
3	\$1,384.35	\$522.20	\$710.79	\$197.41	\$2,689.03	\$164.29	\$144.36	\$39.69	\$7.90	\$7.90
4	\$1,425.88	\$537.87	\$732.11	\$203.33	\$2,769.71	\$169.22	\$148.69	\$40.88	\$8.14	\$8.14
5	\$1,468.66	\$554.00	\$754.08	\$209.43	\$2,852.80	\$174.30	\$153.15	\$42.11	\$8.38	\$8.38
6	\$1,512.72	\$570.62	\$776.70	\$215.71	\$2,938.38	\$179.53	\$157.75	\$43.37	\$8.64	\$8.64
7	\$1,558.10	\$587.74	\$800.00	\$222.18	\$3,026.53	\$184.91	\$162.48	\$44.68	\$8.90	\$8.90
8	\$1,604.84	\$605.38	\$824.00	\$228.85	\$3,117.33	\$190.46	\$167.36	\$46.02	\$9.16	\$9.16
9	\$1,652.99	\$623.54	\$848.72	\$235.71	\$3,210.85	\$196.17	\$172.38	\$47.40	\$9.44	\$9.44
10	\$1,702.58	\$642.24	\$874.18	\$242.79	\$3,307.17	\$202.06	\$177.55	\$48.82	\$9.72	\$9.72
11	\$1,753.65	\$661.51	\$900.41	\$250.07	\$3,406.39	\$208.12	\$182.87	\$50.28	\$10.01	\$10.01
12	\$1,806.26	\$681.36	\$927.42	\$257.57	\$3,508.58	\$214.36	\$188.36	\$51.79	\$10.31	\$10.31
13	\$1,860.45	\$701.80	\$955.24	\$265.30	\$3,613.84	\$220.79	\$194.01	\$53.34	\$10.62	\$10.62
14	\$1,916.26	\$722.85	\$983.90	\$273.26	\$3,722.25	\$227.42	\$199.83	\$54.94	\$10.94	\$10.94
15	\$1,973.75	\$744.54	\$1,013.42	\$281.46	\$3,833.92	\$234.24	\$205.83	\$56.59	\$11.27	\$11.27
ECM	City Hall - Interior	City Hall Annex - Interior	Water Department - Main Office - Interior	Water Department - Garage - Interior	Water Department - Water Filtration Plant - Interior	Water Department - High Service Pump Station - Interior	Water Department - #1 Well House - Interior		Water Department - #3 Well House - Interior	Water Department - #4 Well House - Interior
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%	2%		2%	2%
Initial Yearly Savings (Gas)										
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%		3%	3%
Initial Yearly Savings (Electricity)	\$742.59	\$50.89	\$490.11	\$6.19	\$36.13	\$91.80	\$87.72		\$7.45	\$7.45
Assumed Average Useful Life (Years)	15	15	15	15	15	15	15		15	15
Lifetime Savings	\$13,811.41	\$946.57	\$9,115.45	\$115.20	\$672.06	\$1,707.32	\$1,631.50		\$138.55	\$138.55
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings		Annual Savings	Annual Savings
1	\$742.59	\$50.89	\$490.11	\$6.19	\$36.13	\$91.80	\$87.72		\$7.45	\$7.45
2	\$764.87	\$52.42	\$504.81	\$6.38	\$37.22	\$94.55	\$90.35		\$7.67	\$7.67
3	\$787.82	\$53.99	\$519.95	\$6.57	\$38.33	\$97.39	\$93.06		\$7.90	\$7.90
4	\$811.45	\$55.61	\$535.55	\$6.77	\$39.48	\$100.31	\$95.85		\$8.14	\$8.14
5	\$835.79	\$57.28	\$551.62	\$6.97	\$40.67	\$103.32	\$98.73		\$8.38	\$8.38
6	\$860.87	\$59.00	\$568.17	\$7.18	\$41.89	\$106.42	\$101.69		\$8.64	\$8.64
7	\$886.69	\$60.77	\$585.21	\$7.40	\$43.15	\$109.61	\$104.74		\$8.90	\$8.90
8	\$913.29	\$62.59	\$602.77	\$7.62	\$44.44	\$112.90	\$107.88		\$9.16	\$9.16
9	\$940.69	\$64.47	\$620.85	\$7.85	\$45.77	\$116.29	\$111.12		\$9.44	\$9.44
10	\$968.91	\$66.40	\$639.48	\$8.08	\$47.15	\$119.77	\$114.45		\$9.72	\$9.72
11	\$997.98	\$68.40	\$658.66	\$8.32	\$48.56	\$123.37	\$117.89		\$10.01	\$10.01
12	\$1,027.92	\$70.45	\$678.42	\$8.57	\$50.02	\$127.07	\$121.42		\$10.31	\$10.31
13	\$1,058.76	\$72.56	\$698.77	\$8.83	\$51.52	\$130.88	\$125.07		\$10.62	\$10.62
14	\$1,090.52	\$74.74	\$719.74	\$9.10	\$53.06	\$134.81	\$128.82		\$10.94	\$10.94
15	\$1,123.24	\$76.98	\$741.33	\$9.37	\$54.66	\$138.85	\$132.68		\$11.27	\$11.27
ECM	City Hall - Exterior	City Hall Annex - Exterior	Water Department - Main Office - Exterior	Water Department - Garage - Exterior	Water Department - Water Filtration Plant - Exterior	Water Department - High Service Pump Station - Exterior	Water Department - #1 Well House - Exterior	Water Department - #2 Well House - Exterior		
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%	2%	2%		
Initial Yearly Savings (Gas)										
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%		
Initial Yearly Savings (Electricity)	\$562.29	\$441.33	\$179.88	\$179.88	\$2,498.54	\$63.06	\$48.36	\$37.41		
Assumed Average Useful Life (Years)	15	15	15	15	15	15	15	15		
Lifetime Savings	\$10,458.00	\$8,208.30	\$3,345.60	\$3,345.60	\$46,470.10	\$1,172.91	\$899.35	\$695.88		
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings		
1	\$562.29	\$441.33	\$179.88	\$179.88	\$2,498.54	\$63.06	\$48.36	\$37.41		
2	\$579.16	\$454.57	\$185.28	\$185.28	\$2,573.49	\$64.96	\$49.81	\$38.54		
3	\$596.53	\$468.21	\$190.84	\$190.84	\$2,650.70	\$66.90	\$51.30	\$39.69		
4	\$614.43	\$482.26	\$196.56	\$196.56	\$2,730.22	\$68.91	\$52.84	\$40.88		
5	\$632.86	\$496.72	\$202.46	\$202.46	\$2,812.13	\$70.98	\$54.42	\$42.11		
6	\$651.85	\$511.63	\$208.53	\$208.53	\$2,896.49	\$73.11	\$56.06	\$43.37		
7	\$671.40	\$526.97	\$214.79	\$214.79	\$2,983.39	\$75.30	\$57.74	\$44.68		
8	\$691.55	\$542.78	\$221.23	\$221.23	\$3,072.89	\$77.56	\$59.47	\$46.02		
9	\$712.29	\$559.07	\$227.87	\$227.87	\$3,165.07	\$79.89	\$61.25	\$47.40		
10	\$733.66	\$575.84	\$234.70	\$234.70	\$3,260.03	\$82.28	\$63.09	\$48.82		
11	\$755.67	\$593.11	\$241.75	\$241.75	\$3,357.83	\$84.75	\$64.99	\$50.28		
12	\$778.34	\$610.91	\$249.00	\$249.00	\$3,458.56	\$87.29	\$66.93	\$51.79		
13	\$801.69	\$629.23	\$256.47	\$256.47	\$3,562.32	\$89.91	\$68.94	\$53.34		
14	\$825.74	\$648.11	\$264.16	\$264.16	\$3,669.19	\$92.61	\$71.01	\$54.94		
15	\$850.52	\$667.55	\$272.09	\$272.09	\$3,779.26	\$95.39	\$73.14	\$56.59		

ECM	Water Department - #5 Well House - Total	Water Department - Chemical and Control - Total	Water Department - Chemical and Control 2 - Total	Water Department - Generator - Total	Police Court - Total	Parking Garage - Total
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)						
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$39.38	\$65.36	\$0.00	\$78.63	\$4,851.46	\$1,533.28
Assumed Average Useful Life (Years)	24	15	24	15	15	15
Lifetime Savings	\$732.50	\$1,215.55	\$0.00	\$1,462.46	\$90,231.92	\$28,517.35
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$39.38	\$65.36	\$0.00	\$78.63	\$4,851.46	\$1,533.28
2	\$40.57	\$67.32	\$0.00	\$80.99	\$4,997.01	\$1,579.28
3	\$41.78	\$69.34	\$0.00	\$83.42	\$5,146.92	\$1,626.66
4	\$43.04	\$71.42	\$0.00	\$85.92	\$5,301.32	\$1,675.46
5	\$44.33	\$73.56	\$0.00	\$88.50	\$5,460.36	\$1,725.72
6	\$45.66	\$75.77	\$0.00	\$91.16	\$5,624.17	\$1,777.49
7	\$47.03	\$78.04	\$0.00	\$93.89	\$5,792.90	\$1,830.82
8	\$48.44	\$80.38	\$0.00	\$96.71	\$5,966.69	\$1,885.74
9	\$49.89	\$82.79	\$0.00	\$99.61	\$6,145.69	\$1,942.31
10	\$51.39	\$85.27	\$0.00	\$102.60	\$6,330.06	\$2,000.58
11	\$52.93	\$87.83	\$0.00	\$105.67	\$6,519.96	\$2,060.60
12	\$54.52	\$90.47	\$0.00	\$108.84	\$6,715.56	\$2,122.42
13	\$56.15	\$93.18	\$0.00	\$112.11	\$6,917.02	\$2,186.09
14	\$57.84	\$95.98	\$0.00	\$115.47	\$7,124.54	\$2,251.67
15	\$59.57	\$98.86	\$0.00	\$118.94	\$7,338.27	\$2,319.22
ECM	Water Department - #5 Well House - Interior	Water Department - Chemical and Control - Interior	Water Department - Chemical and Control 2 - Interior	Water Department - Generator - Interior	Police Court - Interior	Parking Garage - Interior
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)						
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$7.45	\$5.50	\$0.00	\$27.27	\$1,862.80	\$0.00
Assumed Average Useful Life (Years)	24	15	24	15	15	15
Lifetime Savings	\$138.55	\$102.23	\$0.00	\$507.27	\$34,645.97	\$0.00
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$7.45	\$5.50	\$0.00	\$27.27	\$1,862.80	\$0.00
2	\$7.67	\$5.66	\$0.00	\$28.09	\$1,918.68	\$0.00
3	\$7.90	\$5.83	\$0.00	\$28.94	\$1,976.24	\$0.00
4	\$8.14	\$6.01	\$0.00	\$29.80	\$2,035.53	\$0.00
5	\$8.38	\$6.19	\$0.00	\$30.70	\$2,096.59	\$0.00
6	\$8.64	\$6.37	\$0.00	\$31.62	\$2,159.49	\$0.00
7	\$8.90	\$6.56	\$0.00	\$32.57	\$2,224.27	\$0.00
8	\$9.16	\$6.76	\$0.00	\$33.54	\$2,291.00	\$0.00
9	\$9.44	\$6.96	\$0.00	\$34.55	\$2,359.73	\$0.00
10	\$9.72	\$7.17	\$0.00	\$35.59	\$2,430.53	\$0.00
11	\$10.01	\$7.39	\$0.00	\$36.65	\$2,503.44	\$0.00
12	\$10.31	\$7.61	\$0.00	\$37.75	\$2,578.54	\$0.00
13	\$10.62	\$7.84	\$0.00	\$38.89	\$2,655.90	\$0.00
14	\$10.94	\$8.07	\$0.00	\$40.05	\$2,735.58	\$0.00
15	\$11.27	\$8.31	\$0.00	\$41.25	\$2,817.64	\$0.00
ECM	Water Department - #5 Well House - Exterior	Water Department - Chemical and Control - Exterior	Water Department - Chemical and Control 2 - Exterior	Water Department - Generator - Exterior	Police Court - Exterior	Parking Garage - Exterior
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)						
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$31.93	\$59.86	\$0.00	\$51.36	\$2,988.67	\$1,533.28
Assumed Average Useful Life (Years)	24	15	24	15	15	15
Lifetime Savings	\$593.95	\$1,113.33	\$0.00	\$955.19	\$55,585.95	\$28,517.35
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$31.93	\$59.86	\$0.00	\$51.36	\$2,988.67	\$1,533.28
2	\$32.89	\$61.66	\$0.00	\$52.90	\$3,078.33	\$1,579.28
3	\$33.88	\$63.51	\$0.00	\$54.48	\$3,170.68	\$1,626.66
4	\$34.90	\$65.41	\$0.00	\$56.12	\$3,265.80	\$1,675.46
5	\$35.94	\$67.37	\$0.00	\$57.80	\$3,363.77	\$1,725.72
6	\$37.02	\$69.39	\$0.00	\$59.54	\$3,464.68	\$1,777.49
7	\$38.13	\$71.48	\$0.00	\$61.32	\$3,568.62	\$1,830.82
8	\$39.28	\$73.62	\$0.00	\$63.16	\$3,675.68	\$1,885.74
9	\$40.45	\$75.83	\$0.00	\$65.06	\$3,785.95	\$1,942.31
10	\$41.67	\$78.10	\$0.00	\$67.01	\$3,899.53	\$2,000.58
11	\$42.92	\$80.45	\$0.00	\$69.02	\$4,016.52	\$2,060.60
12	\$44.20	\$82.86	\$0.00	\$71.09	\$4,137.01	\$2,122.42
13	\$45.53	\$85.35	\$0.00	\$73.22	\$4,261.12	\$2,186.09
14	\$46.90	\$87.91	\$0.00	\$75.42	\$4,388.96	\$2,251.67
15	\$48.30	\$90.54	\$0.00	\$77.68	\$4,520.63	\$2,319.22

	Parks and Recreation - Rockwell Park - Total	Parks and Recreation - Rockwell Pavillion - Total	Parks and Recreation - Bathhouse - Total	Parks and Recreation - Muzzy Field - Total	Parks and Recreation - Ski Lodge - Total	Parks and Recreation - Page Park Pavillion - Total	Parks and Recreation - Recreation Building - Total	Bristol Fire - Fire HQ - Total	Bristol Fire - Engine 2 - Total	Bristol Fire - Engine 3 - Total
ECM										
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)										
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$329.43	\$161.16	\$175.62	\$935.04	\$83.13	\$348.63	\$408.25	\$256.38	\$1,384.56	\$1,907.98
Assumed Average Useful Life (Years)	15	15	15	15	15	15	15	15	15	15
Lifetime Savings	\$6,127.09	\$2,997.41	\$3,266.34	\$17,390.65	\$1,546.04	\$6,484.22	\$7,593.01	\$4,768.32	\$25,751.27	\$35,486.42
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	\$329.43	\$161.16	\$175.62	\$935.04	\$83.13	\$348.63	\$408.25	\$256.38	\$1,384.56	\$1,907.98
2	\$339.32	\$166.00	\$180.89	\$963.09	\$85.62	\$359.09	\$420.50	\$264.07	\$1,426.09	\$1,965.22
3	\$349.49	\$170.98	\$186.32	\$991.98	\$88.19	\$369.87	\$433.11	\$271.99	\$1,468.88	\$2,024.18
4	\$359.98	\$176.10	\$191.90	\$1,021.74	\$90.83	\$380.96	\$446.11	\$280.15	\$1,512.94	\$2,084.91
5	\$370.78	\$181.39	\$197.66	\$1,052.39	\$93.56	\$392.39	\$459.49	\$288.55	\$1,558.33	\$2,147.45
6	\$381.90	\$186.83	\$203.59	\$1,083.96	\$96.37	\$404.16	\$473.27	\$297.21	\$1,605.08	\$2,211.88
7	\$393.36	\$192.43	\$209.70	\$1,116.48	\$99.26	\$416.29	\$487.47	\$306.13	\$1,653.23	\$2,278.23
8	\$405.16	\$198.21	\$215.99	\$1,149.98	\$102.23	\$428.78	\$502.10	\$315.31	\$1,702.83	\$2,346.58
9	\$417.32	\$204.15	\$222.47	\$1,184.48	\$105.30	\$441.64	\$517.16	\$324.77	\$1,753.92	\$2,416.98
10	\$429.83	\$210.28	\$229.14	\$1,220.01	\$108.46	\$454.89	\$532.67	\$334.51	\$1,806.53	\$2,489.49
11	\$442.73	\$216.59	\$236.02	\$1,256.61	\$111.71	\$468.54	\$548.65	\$344.55	\$1,860.73	\$2,564.17
12	\$456.01	\$223.08	\$243.10	\$1,294.31	\$115.07	\$482.59	\$565.11	\$354.88	\$1,916.55	\$2,641.10
13	\$469.69	\$229.78	\$250.39	\$1,333.14	\$118.52	\$497.07	\$582.07	\$365.53	\$1,974.05	\$2,720.33
14	\$483.78	\$236.67	\$257.90	\$1,373.13	\$122.07	\$511.98	\$599.53	\$376.50	\$2,033.27	\$2,801.94
15	\$498.30	\$243.77	\$265.64	\$1,414.33	\$125.73	\$527.34	\$617.52	\$387.79	\$2,094.27	\$2,886.00
ECM	Parks and Recreation - Rockwell Park - Interior	Parks and Recreation - Rockwell Pavillion - Interior	Parks and Recreation - Bathhouse - Interior	Parks and Recreation - Muzzy Field - Interior	Parks and Recreation - Ski Lodge - Interior	Parks and Recreation - Page Park Pavillion - Interior	Parks and Recreation - Recreation Building - Interior	Bristol Fire - Fire HQ - Interior	Bristol Fire - Engine 2 - Interior	Bristol Fire - Engine 3 - Interior
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)										
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$315.14	\$32.62	\$114.53	\$510.19	\$68.37	\$169.20	\$232.30	\$44.70	\$82.91	\$181.85
Assumed Average Useful Life (Years)	15	15	15	15	15	15	15	15	15	15
Lifetime Savings	\$5,861.18	\$606.73	\$2,130.13	\$9,488.93	\$1,271.67	\$3,146.87	\$4,320.49	\$831.40	\$1,542.02	\$3,382.17
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	\$315.14	\$32.62	\$114.53	\$510.19	\$68.37	\$169.20	\$232.30	\$44.70	\$82.91	\$181.85
2	\$324.59	\$33.60	\$117.97	\$525.49	\$70.42	\$174.27	\$239.27	\$46.04	\$85.40	\$187.30
3	\$334.33	\$34.61	\$121.50	\$541.26	\$72.54	\$179.50	\$246.44	\$47.42	\$87.96	\$192.92
4	\$344.36	\$35.65	\$125.15	\$557.50	\$74.71	\$184.89	\$253.84	\$48.85	\$90.60	\$198.71
5	\$354.69	\$36.72	\$128.90	\$574.22	\$76.95	\$190.43	\$261.45	\$50.31	\$93.32	\$204.67
6	\$365.33	\$37.82	\$132.77	\$591.45	\$79.26	\$196.14	\$269.30	\$51.82	\$96.11	\$210.81
7	\$376.29	\$38.95	\$136.75	\$609.19	\$81.64	\$202.03	\$277.38	\$53.38	\$99.00	\$217.14
8	\$387.58	\$40.12	\$140.86	\$627.47	\$84.09	\$208.09	\$285.70	\$54.98	\$101.97	\$223.65
9	\$399.20	\$41.32	\$145.08	\$646.29	\$86.61	\$214.33	\$294.27	\$56.63	\$105.03	\$230.36
10	\$411.18	\$42.56	\$149.44	\$665.68	\$89.21	\$220.76	\$303.10	\$58.33	\$108.18	\$237.27
11	\$423.52	\$43.84	\$153.92	\$685.65	\$91.89	\$227.39	\$312.19	\$60.07	\$111.42	\$244.39
12	\$436.22	\$45.16	\$158.54	\$706.22	\$94.64	\$234.21	\$321.55	\$61.88	\$114.77	\$251.72
13	\$449.31	\$46.51	\$163.29	\$727.41	\$97.48	\$241.23	\$331.20	\$63.73	\$118.21	\$259.27
14	\$462.79	\$47.91	\$168.19	\$749.23	\$100.41	\$248.47	\$341.14	\$65.65	\$121.76	\$267.05
15	\$476.67	\$49.34	\$173.24	\$771.70	\$103.42	\$255.92	\$351.37	\$67.61	\$125.41	\$275.06
ECM	Parks and Recreation - Rockwell Park - Exterior	Parks and Recreation - Rockwell Pavillion - Exterior	Parks and Recreation - Bathhouse - Exterior	Parks and Recreation - Muzzy Field - Exterior	Parks and Recreation - Ski Lodge - Exterior	Parks and Recreation - Page Park Pavillion - Exterior	Parks and Recreation - Recreation Building - Exterior	Bristol Fire - Fire HQ - Exterior	Bristol Fire - Engine 2 - Exterior	Bristol Fire - Engine 3 - Exterior
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)										
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$14.30	\$128.54	\$61.09	\$424.85	\$14.75	\$179.44	\$175.95	\$211.67	\$1,301.65	\$1,726.14
Assumed Average Useful Life (Years)	15	15	15	15	15	15	15	15	15	15
Lifetime Savings	\$265.90	\$2,390.68	\$1,136.22	\$7,901.72	\$274.37	\$3,337.35	\$3,272.53	\$3,936.92	\$24,209.25	\$32,104.26
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	\$14.30	\$128.54	\$61.09	\$424.85	\$14.75	\$179.44	\$175.95	\$211.67	\$1,301.65	\$1,726.14
2	\$14.73	\$132.40	\$62.92	\$437.59	\$15.19	\$184.82	\$181.23	\$218.03	\$1,340.70	\$1,777.92
3	\$15.17	\$136.37	\$64.81	\$450.72	\$15.65	\$190.37	\$186.67	\$224.57	\$1,380.92	\$1,831.26
4	\$15.62	\$140.46	\$66.76	\$464.24	\$16.12	\$196.08	\$192.27	\$231.30	\$1,422.35	\$1,886.20
5	\$16.09	\$144.67	\$68.76	\$478.17	\$16.60	\$201.96	\$198.04	\$238.24	\$1,465.02	\$1,942.78
6	\$16.57	\$149.01	\$70.82	\$492.52	\$17.10	\$208.02	\$203.98	\$245.39	\$1,508.97	\$2,001.06
7	\$17.07	\$153.48	\$72.95	\$507.29	\$17.61	\$214.26	\$210.10	\$252.75	\$1,554.24	\$2,061.10
8	\$17.58	\$158.09	\$75.13	\$522.51	\$18.14	\$220.69	\$216.40	\$260.33	\$1,600.86	\$2,122.93
9	\$18.11	\$162.83	\$77.39	\$538.19	\$18.69	\$227.31	\$222.89	\$268.14	\$1,648.89	\$2,186.62
10	\$18.65	\$167.71	\$79.71	\$554.33	\$19.25	\$234.13	\$229.58	\$276.19	\$1,698.36	\$2,252.22
11	\$19.21	\$172.75	\$82.10	\$570.96	\$19.83	\$241.15	\$236.47	\$284.47	\$1,749.31	\$2,319.78
12	\$19.79	\$177.93	\$84.56	\$588.09	\$20.42	\$248.38	\$243.56	\$293.01	\$1,801.79	\$2,389.38
13	\$20.38	\$183.27	\$87.10	\$605.73	\$21.03	\$255.84	\$250.87	\$301.80	\$1,855.84	\$2,461.06
14	\$21.00	\$188.76	\$89.71	\$623.90	\$21.66	\$263.51	\$258.39	\$310.85	\$1,911.51	\$2,534.89
15	\$21.63	\$194.43	\$92.40	\$642.62	\$22.31	\$271.42	\$266.14	\$320.18	\$1,968.86	\$2,610.94

	Bristol Fire - Engine 4 - Total	Bristol Fire - Engine 5 - Total	Senior Center - Total	Main Library - Total	Public Library - Total	Youth Services - Main Building - Total	Public Works - Animal Control - Total	Public Works - Community - Total	Public Works - Hill Street Total	Public Works - City Yard - Total
ECM										
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)										
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$271.59	\$2,108.91	\$1,238.51	\$318.33	\$415.94	\$295.09	\$1.39	\$7.04	\$1,236.63	\$2,450.71
Assumed Average Useful Life (Years)	24	15	24	15	15	24	15	24	15	15
Lifetime Savings	\$5,051.22	\$39,223.37	\$23,035.01	\$5,920.56	\$7,736.08	\$5,488.35	\$25.79	\$131.01	\$23,000.06	\$45,580.61
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	\$271.59	\$2,108.91	\$1,238.51	\$318.33	\$415.94	\$295.09	\$1.39	\$7.04	\$1,236.63	\$2,450.71
2	\$279.73	\$2,172.17	\$1,275.67	\$327.88	\$428.42	\$303.94	\$1.43	\$7.26	\$1,273.73	\$2,524.23
3	\$288.13	\$2,237.34	\$1,313.94	\$337.71	\$441.27	\$313.06	\$1.47	\$7.47	\$1,311.95	\$2,599.96
4	\$296.77	\$2,304.46	\$1,353.36	\$347.85	\$454.51	\$322.45	\$1.52	\$7.70	\$1,351.30	\$2,677.96
5	\$305.67	\$2,373.59	\$1,393.96	\$358.28	\$468.15	\$332.13	\$1.56	\$7.93	\$1,391.84	\$2,758.30
6	\$314.84	\$2,444.80	\$1,435.78	\$369.03	\$482.19	\$342.09	\$1.61	\$8.17	\$1,433.60	\$2,841.05
7	\$324.29	\$2,518.14	\$1,478.85	\$380.10	\$496.66	\$352.35	\$1.66	\$8.41	\$1,476.61	\$2,926.28
8	\$334.02	\$2,593.69	\$1,523.22	\$391.50	\$511.56	\$362.92	\$1.71	\$8.66	\$1,520.90	\$3,014.07
9	\$344.04	\$2,671.50	\$1,568.91	\$403.25	\$526.90	\$373.81	\$1.76	\$8.92	\$1,566.53	\$3,104.49
10	\$354.36	\$2,751.64	\$1,615.98	\$415.35	\$542.71	\$385.02	\$1.81	\$9.19	\$1,613.53	\$3,197.63
11	\$364.99	\$2,834.19	\$1,664.46	\$427.81	\$558.99	\$396.58	\$1.86	\$9.47	\$1,661.93	\$3,293.55
12	\$375.94	\$2,919.22	\$1,714.39	\$440.64	\$575.76	\$408.47	\$1.92	\$9.75	\$1,711.79	\$3,392.36
13	\$387.22	\$3,006.80	\$1,765.82	\$453.86	\$593.03	\$420.73	\$1.98	\$10.04	\$1,763.14	\$3,494.13
14	\$398.83	\$3,097.00	\$1,818.80	\$467.48	\$610.83	\$433.35	\$2.04	\$10.34	\$1,816.04	\$3,598.96
15	\$410.80	\$3,189.91	\$1,873.36	\$481.50	\$629.15	\$446.35	\$2.10	\$10.65	\$1,870.52	\$3,706.92
ECM	Bristol Fire - Engine 4 - Interior	Bristol Fire - Engine 5 - Interior	Senior Center - Interior	Main Library - Interior	Public Library - Interior	Youth Services - Main Building - Interior	Public Works - Animal Control - Interior	Public Works - Community - Interior	Public Works - Hill Street Interior	Public Works - City Yard - Interior
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)										
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$4.32	\$581.99	\$142.94	\$75.56	\$129.60	\$110.07	\$1.37	\$7.04	\$787.72	\$0.00
Assumed Average Useful Life (Years)	24	15	24	15	15	24	15	24	15	15
Lifetime Savings	\$80.41	\$10,824.36	\$2,658.52	\$1,405.27	\$2,410.40	\$2,047.19	\$25.46	\$131.01	\$14,650.72	\$0.00
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	\$4.32	\$581.99	\$142.94	\$75.56	\$129.60	\$110.07	\$1.37	\$7.04	\$787.72	\$0.00
2	\$4.45	\$599.45	\$147.23	\$77.82	\$133.49	\$113.37	\$1.41	\$7.26	\$811.35	\$0.00
3	\$4.59	\$617.43	\$151.64	\$80.16	\$137.49	\$116.77	\$1.45	\$7.47	\$835.69	\$0.00
4	\$4.72	\$635.95	\$156.19	\$82.56	\$141.62	\$120.28	\$1.50	\$7.70	\$860.76	\$0.00
5	\$4.87	\$655.03	\$160.88	\$85.04	\$145.86	\$123.89	\$1.54	\$7.93	\$886.59	\$0.00
6	\$5.01	\$674.68	\$165.71	\$87.59	\$150.24	\$127.60	\$1.59	\$8.17	\$913.18	\$0.00
7	\$5.16	\$694.92	\$170.68	\$90.22	\$154.75	\$131.43	\$1.63	\$8.41	\$940.58	\$0.00
8	\$5.32	\$715.77	\$175.80	\$92.92	\$159.39	\$135.37	\$1.68	\$8.66	\$968.80	\$0.00
9	\$5.48	\$737.25	\$181.07	\$95.71	\$164.17	\$139.43	\$1.73	\$8.92	\$997.86	\$0.00
10	\$5.64	\$759.36	\$186.50	\$98.58	\$169.10	\$143.62	\$1.79	\$9.19	\$1,027.80	\$0.00
11	\$5.81	\$782.14	\$192.10	\$101.54	\$174.17	\$147.93	\$1.84	\$9.47	\$1,058.63	\$0.00
12	\$5.98	\$805.61	\$197.86	\$104.59	\$179.40	\$152.36	\$1.89	\$9.75	\$1,090.39	\$0.00
13	\$6.16	\$829.78	\$203.80	\$107.73	\$184.78	\$156.93	\$1.95	\$10.04	\$1,123.10	\$0.00
14	\$6.35	\$854.67	\$209.91	\$110.96	\$190.32	\$161.64	\$2.01	\$10.34	\$1,156.79	\$0.00
15	\$6.54	\$880.31	\$216.21	\$114.29	\$196.03	\$166.49	\$2.07	\$10.65	\$1,191.50	\$0.00
ECM	Bristol Fire - Engine 4 - Exterior	Bristol Fire - Engine 5 - Exterior	Senior Center - Exterior	Main Library - Exterior	Public Library - Exterior	Youth Services - Main Building - Exterior	Public Works - Animal Control - Exterior	Public Works - Community - Exterior	Public Works - Hill Street Exterior	Public Works - City Yard - Exterior
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)										
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$267.26	\$1,526.92	\$1,095.57	\$242.77	\$286.34	\$185.02	\$0.02	\$0.00	\$448.91	\$2,450.71
Assumed Average Useful Life (Years)	24	15	24	15	15	24	15	24	15	15
Lifetime Savings	\$4,970.81	\$28,399.02	\$20,376.48	\$4,515.30	\$5,325.68	\$3,441.15	\$0.33	\$0.00	\$8,349.33	\$45,580.61
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	\$267.26	\$1,526.92	\$1,095.57	\$242.77	\$286.34	\$185.02	\$0.02	\$0.00	\$448.91	\$2,450.71
2	\$275.28	\$1,572.73	\$1,128.44	\$250.06	\$294.93	\$190.57	\$0.02	\$0.00	\$462.38	\$2,524.23
3	\$283.54	\$1,619.91	\$1,162.29	\$257.56	\$303.78	\$196.29	\$0.02	\$0.00	\$476.25	\$2,599.96
4	\$292.05	\$1,668.50	\$1,197.16	\$265.28	\$312.90	\$202.18	\$0.02	\$0.00	\$490.54	\$2,677.96
5	\$300.81	\$1,718.56	\$1,233.08	\$273.24	\$322.28	\$208.24	\$0.02	\$0.00	\$505.26	\$2,758.30
6	\$309.83	\$1,770.12	\$1,270.07	\$281.44	\$331.95	\$214.49	\$0.02	\$0.00	\$520.42	\$2,841.05
7	\$319.13	\$1,823.22	\$1,308.17	\$289.88	\$341.91	\$220.92	\$0.02	\$0.00	\$536.03	\$2,926.28
8	\$328.70	\$1,877.92	\$1,347.42	\$298.58	\$352.17	\$227.55	\$0.02	\$0.00	\$552.11	\$3,014.07
9	\$338.56	\$1,934.25	\$1,387.84	\$307.54	\$362.73	\$234.38	\$0.02	\$0.00	\$568.67	\$3,104.49
10	\$348.72	\$1,992.28	\$1,429.48	\$316.76	\$373.61	\$241.41	\$0.02	\$0.00	\$585.73	\$3,197.63
11	\$359.18	\$2,052.05	\$1,472.36	\$326.27	\$384.82	\$248.65	\$0.02	\$0.00	\$603.30	\$3,293.55
12	\$369.95	\$2,113.61	\$1,516.53	\$336.05	\$396.37	\$256.11	\$0.02	\$0.00	\$621.40	\$3,392.36
13	\$381.05	\$2,177.02	\$1,562.03	\$346.13	\$408.26	\$263.79	\$0.03	\$0.00	\$640.05	\$3,494.13
14	\$392.49	\$2,242.33	\$1,608.89	\$356.52	\$420.50	\$271.71	\$0.03	\$0.00	\$659.25	\$3,598.96
15	\$404.26	\$2,309.60	\$1,657.15	\$367.21	\$433.12	\$279.86	\$0.03	\$0.00	\$679.02	\$3,706.92

ECM	Public Works - Transfer Station Scale House - Total	Public Works - Transfer Station Hut - Total	Water Pollution Control - Operations- Total	Water Pollution Control - Headworks - Total	Water Pollution Control Air Blower - Total	Water Pollution Control - Pump House - Total	Water Pollution Control - Sludge Thickening Building - Total
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)							
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$164.47	\$2,009.61	\$3.62	\$62.06	\$93.08	\$62.06	\$87.16
Assumed Average Useful Life (Years)	15	15	15	15	15	15	15
Lifetime Savings	\$3,058.99	\$37,376.47	\$67.31	\$1,154.17	\$1,731.26	\$1,154.17	\$1,621.10
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings
1	\$164.47	\$2,009.61	\$3.62	\$62.06	\$93.08	\$62.06	\$87.16
2	\$169.41	\$2,069.89	\$3.73	\$63.92	\$95.88	\$63.92	\$89.78
3	\$174.49	\$2,131.99	\$3.84	\$65.84	\$98.75	\$65.84	\$92.47
4	\$179.72	\$2,195.95	\$3.95	\$67.81	\$101.72	\$67.81	\$95.24
5	\$185.11	\$2,261.83	\$4.07	\$69.84	\$104.77	\$69.84	\$98.10
6	\$190.67	\$2,329.68	\$4.20	\$71.94	\$107.91	\$71.94	\$101.04
7	\$196.39	\$2,399.57	\$4.32	\$74.10	\$111.15	\$74.10	\$104.07
8	\$202.28	\$2,471.56	\$4.45	\$76.32	\$114.48	\$76.32	\$107.20
9	\$208.35	\$2,545.71	\$4.58	\$78.61	\$117.92	\$78.61	\$110.41
10	\$214.60	\$2,622.08	\$4.72	\$80.97	\$121.45	\$80.97	\$113.73
11	\$221.04	\$2,700.74	\$4.86	\$83.40	\$125.10	\$83.40	\$117.14
12	\$227.67	\$2,781.76	\$5.01	\$85.90	\$128.85	\$85.90	\$120.65
13	\$234.50	\$2,865.22	\$5.16	\$88.48	\$132.72	\$88.48	\$124.27
14	\$241.53	\$2,951.17	\$5.31	\$91.13	\$136.70	\$91.13	\$128.00
15	\$248.78	\$3,039.71	\$5.47	\$93.87	\$140.80	\$93.87	\$131.84
ECM	Public Works - Transfer Station Hut - Interior	Water Pollution Control - Operations - Interior					
Assumed Inflation (Gas)	2%	2%					
Initial Yearly Savings (Gas)							
Assumed Inflation (Electricity)	3%	3%					
Initial Yearly Savings (Electricity)	\$1,456.06	\$3.62					
Assumed Average Useful Life (Years)	15	15					
Lifetime Savings	\$27,081.17	\$67.31					
Year	Annual Savings	Annual Savings					
1	\$1,456.06	\$3.62					
2	\$1,499.74	\$3.73					
3	\$1,544.74	\$3.84					
4	\$1,591.08	\$3.95					
5	\$1,638.81	\$4.07					
6	\$1,687.98	\$4.20					
7	\$1,738.61	\$4.32					
8	\$1,790.77	\$4.45					
9	\$1,844.50	\$4.58					
10	\$1,899.83	\$4.72					
11	\$1,956.83	\$4.86					
12	\$2,015.53	\$5.01					
13	\$2,076.00	\$5.16					
14	\$2,138.28	\$5.31					
15	\$2,202.42	\$5.47					
ECM	Public Works - Transfer Station Scale House - Exterior	Public Works - Transfer Station Hut - Exterior	Water Pollution Control - Headworks - Exterior	Water Pollution Control - Air Blower - Exterior	Water Pollution Control Pump House - Exterior	Water Pollution Control - Sludge Thickening Building - Exterior	
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%	
Initial Yearly Savings (Gas)							
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	
Initial Yearly Savings (Electricity)	\$164.47	\$553.54	\$62.06	\$93.08	\$62.06	\$87.16	
Assumed Average Useful Life (Years)	15	15	15	15	15	15	
Lifetime Savings	\$3,058.99	\$10,295.30	\$1,154.17	\$1,731.26	\$1,154.17	\$1,621.10	
Year	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	Annual Savings	
1	\$164.47	\$553.54	\$62.06	\$93.08	\$62.06	\$87.16	
2	\$169.41	\$570.15	\$63.92	\$95.88	\$63.92	\$89.78	
3	\$174.49	\$587.25	\$65.84	\$98.75	\$65.84	\$92.47	
4	\$179.72	\$604.87	\$67.81	\$101.72	\$67.81	\$95.24	
5	\$185.11	\$623.02	\$69.84	\$104.77	\$69.84	\$98.10	
6	\$190.67	\$641.71	\$71.94	\$107.91	\$71.94	\$101.04	
7	\$196.39	\$660.96	\$74.10	\$111.15	\$74.10	\$104.07	
8	\$202.28	\$680.79	\$76.32	\$114.48	\$76.32	\$107.20	
9	\$208.35	\$701.21	\$78.61	\$117.92	\$78.61	\$110.41	
10	\$214.60	\$722.25	\$80.97	\$121.45	\$80.97	\$113.73	
11	\$221.04	\$743.92	\$83.40	\$125.10	\$83.40	\$117.14	
12	\$227.67	\$766.23	\$85.90	\$128.85	\$85.90	\$120.65	
13	\$234.50	\$789.22	\$88.48	\$132.72	\$88.48	\$124.27	
14	\$241.53	\$812.90	\$91.13	\$136.70	\$91.13	\$128.00	
15	\$248.78	\$837.28	\$93.87	\$140.80	\$93.87	\$131.84	

ECM	Water Pollution Control - Sludge Disposal - Total	Water Pollution Control - Broad Street PS - Total	Water Pollution Control - Cherry Hill PS - Total	Water Pollution Control - Cross PS - Total	Water Pollution Control - Drayla PS - Total	Water Pollution Control - East Main PS - Total	Water Pollution Control - Ivy PS - Total	Water Pollution Control - Julia PS - Total	Water Pollution Control - Lake PS - Total	Water Pollution Control - Lufkin PS - Total
Assumed Inflation (Gas)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)										
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$0.00	\$0.62	\$0.76	\$1.31	\$9.02	\$0.33	\$0.32	\$0.31	\$0.45	\$0.68
Assumed Average Useful Life (Years)	15	15	15	15	15	15	15	15	15	15
Lifetime Savings	\$0.00	\$11.48	\$14.15	\$24.43	\$167.75	\$6.15	\$5.89	\$5.75	\$8.38	\$12.66
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$0.00	\$0.62	\$0.76	\$1.31	\$9.02	\$0.33	\$0.32	\$0.31	\$0.45	\$0.68
2	\$0.00	\$0.64	\$0.78	\$1.35	\$9.29	\$0.34	\$0.33	\$0.32	\$0.46	\$0.70
3	\$0.00	\$0.65	\$0.81	\$1.39	\$9.57	\$0.35	\$0.34	\$0.33	\$0.48	\$0.72
4	\$0.00	\$0.67	\$0.83	\$1.44	\$9.86	\$0.36	\$0.35	\$0.34	\$0.49	\$0.74
5	\$0.00	\$0.69	\$0.86	\$1.48	\$10.15	\$0.37	\$0.36	\$0.35	\$0.51	\$0.77
6	\$0.00	\$0.72	\$0.88	\$1.52	\$10.46	\$0.38	\$0.37	\$0.36	\$0.52	\$0.79
7	\$0.00	\$0.74	\$0.91	\$1.57	\$10.77	\$0.39	\$0.38	\$0.37	\$0.54	\$0.81
8	\$0.00	\$0.76	\$0.94	\$1.62	\$11.09	\$0.41	\$0.39	\$0.38	\$0.55	\$0.84
9	\$0.00	\$0.78	\$0.96	\$1.66	\$11.43	\$0.42	\$0.40	\$0.39	\$0.57	\$0.86
10	\$0.00	\$0.81	\$0.99	\$1.71	\$11.77	\$0.43	\$0.41	\$0.40	\$0.59	\$0.89
11	\$0.00	\$0.83	\$1.02	\$1.77	\$12.12	\$0.44	\$0.43	\$0.42	\$0.61	\$0.91
12	\$0.00	\$0.85	\$1.05	\$1.82	\$12.48	\$0.46	\$0.44	\$0.43	\$0.62	\$0.94
13	\$0.00	\$0.88	\$1.08	\$1.87	\$12.86	\$0.47	\$0.45	\$0.44	\$0.64	\$0.97
14	\$0.00	\$0.91	\$1.12	\$1.93	\$13.25	\$0.49	\$0.47	\$0.45	\$0.66	\$1.00
15	\$0.00	\$0.93	\$1.15	\$1.99	\$13.64	\$0.50	\$0.48	\$0.47	\$0.68	\$1.03

ECM	Water Pollution Control - Matthews PS - Total	Water Pollution Control - Middle PS - Total	Water Pollution Control - Minor PS - Total	Water Pollution Control - Boivin PS - Total	Water Pollution Control - Tyler PS - Total
Assumed Inflation (Gas)	2%	2%	2%	2%	2%
Initial Yearly Savings (Gas)					
Assumed Inflation (Electricity)	3%	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$0.99	\$1.04	\$0.96	\$0.64	\$1.04
Assumed Average Useful Life (Years)	15	15	15	15	15
Lifetime Savings	\$18.49	\$19.34	\$17.78	\$11.96	\$19.36
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$0.99	\$1.04	\$0.96	\$0.64	\$1.04
2	\$1.02	\$1.07	\$0.98	\$0.66	\$1.07
3	\$1.05	\$1.10	\$1.01	\$0.68	\$1.10
4	\$1.09	\$1.14	\$1.04	\$0.70	\$1.14
5	\$1.12	\$1.17	\$1.08	\$0.72	\$1.17
6	\$1.15	\$1.21	\$1.11	\$0.75	\$1.21
7	\$1.19	\$1.24	\$1.14	\$0.77	\$1.24
8	\$1.22	\$1.28	\$1.18	\$0.79	\$1.28
9	\$1.26	\$1.32	\$1.21	\$0.81	\$1.32
10	\$1.30	\$1.36	\$1.25	\$0.84	\$1.36
11	\$1.34	\$1.40	\$1.28	\$0.86	\$1.40
12	\$1.38	\$1.44	\$1.32	\$0.89	\$1.44
13	\$1.42	\$1.48	\$1.36	\$0.92	\$1.48
14	\$1.46	\$1.53	\$1.40	\$0.94	\$1.53
15	\$1.50	\$1.57	\$1.45	\$0.97	\$1.57

Lighting Maintenance Cost Savings

T12 to T8 Retrofit	T12 Bulb Cost	T8 Bulb Cost	T12 Bulb Average Lifetime (Years)	T8 Bulb Average Lifetime (Years)	Quantity of T12 Replacements vs. T8 Replacements	Cost of T12 Replacement over T8 Life	T8 Bulb Replacements Over Lifetime (25 Yrs)
1	Lamp	\$67.0	4.6	5.7	1.25	\$67.0	3
2	Lamp	\$67.0	4.6	5.7	1.25	\$67.0	3
3	Lamp	\$94.9	\$90.5	4.6	5.7	\$118.6	3
4	Lamp	\$114.0	\$110.0	4.6	5.7	\$245.8	3
Incandescent to CFL Retrofits	Incandescent Cost	CFL Cost	Incandescent Average Lifetime (Years)	CFL Average Lifetime (Years)	Quantity of Incandescent Replacements vs. CFL Replacements	Cost of Incandescent Replacement over CFL Life	CFL Replacements Over Lifetime (25 Yrs)
13	Wall	\$13.0	0.5	2.3	5	\$65.0	7
25	Wall	\$27.0	0.5	2.3	5	\$65.0	7
25	Wall	\$13.0	0.5	2.3	5	\$65.0	7
45	Wall	\$27.0	0.5	2.3	5	\$105.0	7
120	Wall	\$27.0	0.5	2.3	5	\$110.0	7
Metal Halide to Induction Retrofit	Metal Halide Cost	Induction Cost	Metal Halide Average Lifetime (Years)	Induction Average Lifetime (Years)	Quantity of Metal Halide Replacements vs. Induction Replacements	Cost of Metal Halide Replacement over Induction Life	Induction Replacements Over Lifetime (25 Yrs)
400	Wall	\$485.0	4.6	22.8	5	\$450.0	1
250	Wall	\$80.0	\$350.0	4.6	22.8	\$450.0	1
HPS to Induction Retrofit	HPS Cost	Induction Cost	HPS Average Lifetime (Years)	Induction Average Lifetime (Years)	Quantity of HPS Replacements vs. Induction Replacements	Cost of HPS over Induction Life	Induction Replacements Over Lifetime (25 Yrs)
250	Wall	\$80.0	\$350.0	4.6	22.8	\$450.0	1
175	Wall	\$178.0	\$350.0	4.6	22.8	\$350.0	1
100	Wall	\$74.0	\$350.0	4.6	22.8	\$275.0	1
100	Wall	\$55.0	\$350.0	4.6	22.8	\$275.0	1
10	Wall	\$25.0	\$350.0	4.6	22.8	\$25.0	1
Halogen to Induction Retrofit	Halogen Cost	Induction Cost	Halogen Average Lifetime (Years)	Induction Average Lifetime (Years)	Quantity of Halogen Replacements vs. Induction Replacements	Cost of Halogen over Induction Life	Induction Replacements Over Lifetime (25 Yrs)
100	Wall	\$20.0	\$350.0	0.2	22.8	\$2,283.1	1
Metal Halide to Fluorescent	Metal Halide Cost	Fluorescent Cost	Metal Halide Average Lifetime (Years)	Fluorescent Average Lifetime (Years)	Quantity of Metal Halide Replacements vs. Fluorescent Replacements	Cost of Metal Halide Replacement over Fluorescent Life	Replacements Over Lifetime (25 Yrs)
8	Lamp	\$88.0	4.6	5.7	1.25	\$107.5	3
4	Lamp	\$48.0	\$174.0	4.6	5.7	\$50.0	3

Interior & Exterior	Building	INC-CFL (23W)	INC-CFL (25W)	INC-CFL (29W)	T12->T8 (1 Lamp)	T12->T8 (2 Lamp)	T12->T8 (3 Lamp)	HD->FL (6 Lamp)	70W HD->INCUCN	400W HD->INCUCN	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
City Hall - Exterior		\$8,988.1	\$1,650.6	\$0.0	\$344.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$735.28	\$735.28	City Hall - Exterior
City Hall Annex - Interior		\$1,325.0	\$0.0	\$0.0	\$0.0	\$137.8	\$0.0	\$0.0	\$0.0	\$0.0	\$2,284.7	\$138.98	City Hall Annex - Interior
Water Department - Main Office - Interior		\$1,785.0	\$0.0	\$0.0	\$450.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$4,725.4	\$245.69	Water Department - Main Office - Interior
Water Department - Garage - Interior		\$0.0	\$0.0	\$0.0	\$0.0	\$137.8	\$0.0	\$0.0	\$0.0	\$0.0	\$137.8	\$6.15	Water Department - Garage - Interior
Water Department - Water Filtration Plant - Interior		\$757.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$757.2	\$33.14	Water Department - Water Filtration Plant - Interior
Water Department - High Service Pump Station - Interior		\$757.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$757.2	\$33.14	Water Department - High Service Pump Station - Interior
Water Department - #1 Wall House - Interior		\$2,180.2	\$0.0	\$0.0	\$0.0	\$183.7	\$0.0	\$0.0	\$0.0	\$0.0	\$2,263.9	\$159.47	Water Department - #1 Wall House - Interior
Water Department - #2 Wall House - Interior		\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.08	Water Department - #2 Wall House - Interior
Water Department - #3 Wall House - Interior		\$358.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$358.6	\$26.57	Water Department - #3 Wall House - Interior
Water Department - #4 Wall House - Interior		\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$26.57	Water Department - #4 Wall House - Interior

Building	INC-CFL (23W)	INC-CFL (25W)	INC-CFL (29W)	T12->T8 (1 Lamp)	T12->T8 (2 Lamp)	T12->T8 (3 Lamp)	HD->FL (6 Lamp)	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
City Hall - Exterior	\$8,988.1	\$1,650.6	\$0.0	\$344.2	\$0.0	\$0.0	\$0.0	\$735.28	\$735.28	City Hall - Exterior
City Hall Annex - Exterior	\$159.3	\$0.0	\$0.0	\$0.0	\$137.8	\$0.0	\$0.0	\$22.47	\$137.7	City Hall Annex - Exterior
Water Department - Main Office - Exterior	\$65.0	\$0.0	\$0.0	\$0.0	\$450.0	\$0.0	\$0.0	\$615.0	\$263.56	Water Department - Main Office - Exterior
Water Department - Garage - Exterior	\$0.0	\$0.0	\$0.0	\$0.0	\$137.8	\$0.0	\$0.0	\$9.16	\$137.8	Water Department - Garage - Exterior
Water Department - Water Filtration Plant - Exterior	\$757.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$757.2	\$33.14	Water Department - Water Filtration Plant - Exterior
Water Department - High Service Pump Station - Exterior	\$757.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$757.2	\$33.14	Water Department - High Service Pump Station - Exterior
Water Department - #1 Wall House - Exterior	\$2,180.2	\$0.0	\$0.0	\$0.0	\$183.7	\$0.0	\$0.0	\$2,375.9	\$158.99	Water Department - #1 Wall House - Exterior
Water Department - #2 Wall House - Exterior	\$358.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$358.6	\$26.57	Water Department - #2 Wall House - Exterior
Water Department - #3 Wall House - Exterior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	Water Department - #3 Wall House - Exterior
Water Department - #4 Wall House - Exterior	\$358.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$358.6	\$26.57	Water Department - #4 Wall House - Exterior

Exterior	Building	INC-CFL (23W)	INC-CFL (25W)	70W HD->INCUCN	400W HD->INCUCN	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
City Hall - Total		\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	City Hall - Total
City Hall Annex - Total		\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	City Hall Annex - Total
Water Department - Main Office - Total		\$1,385.7	\$0.0	\$0.0	\$0.0	\$1,385.7	\$68.19	Water Department - Main Office - Total
Water Department - Garage - Total		\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	Water Department - Garage - Total
Water Department - Water Filtration Plant - Total		\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	Water Department - Water Filtration Plant - Total
Water Department - High Service Pump Station - Total		\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	Water Department - High Service Pump Station - Total
Water Department - #1 Wall House - Total		\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	Water Department - #1 Wall House - Total
Water Department - #2 Wall House - Total		\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	Water Department - #2 Wall House - Total

T12 (in T8 Recept)		T12 Bulk Cost		T8 Bulk Cost		T12 Bulk Average Lifetime (Years)		T8 Bulk Average Lifetime (Years)		Quantity of T12 Replacements vs. T8 Replacements		Cost of T12 Replacements over 10 Yrs		T8 Bulk Replacements Over Lifetime (28 Yrs)	
1	Lamp	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	2	2		2
2	Lamp	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	2	2		2
3	Lamp	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	2	2		2
4	Lamp	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	2	2		2
Incandescent vs. CFL Recept		Incandescent Cost		CFL Cost		Incandescent Average Lifetime (Years)		CFL Average Lifetime (Years)		Quantity of Incandescent Replacements vs. CFL Replacements		Cost of Incandescent Replacements over CFL Life		CFL Replacements Over Lifetime (28 Yrs)	
13	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	7	7		7
14	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	7	7		7
15	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	7	7		7
16	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	7	7		7
17	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	7	7		7
18	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	7	7		7
Metal Halide vs. Induction Recept		Metal Halide Cost		Induction Cost		Metal Halide Average Lifetime (Years)		Induction Average Lifetime (Years)		Quantity of Metal Halide Replacements vs. Induction Replacements		Cost of Metal Halide Replacements over Induction Life		Induction Replacements Over Lifetime (28 Yrs)	
200	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	3	3		3
201	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	3	3		3
HPS vs. Induction Recept		HPS Cost		Induction Cost		HPS Average Lifetime (Years)		Induction Average Lifetime (Years)		Quantity of HPS Replacements vs. Induction Replacements		Cost of HPS over Induction Life		Induction Replacements Over Lifetime (28 Yrs)	
210	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	2	2		2
211	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	2	2		2
212	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	2	2		2
213	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	2	2		2
214	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	2	2		2
Halogen vs. Induction Recept		Halogen Cost		Induction Cost		Halogen Average Lifetime (Years)		Induction Average Lifetime (Years)		Quantity of Halogen Replacements vs. Induction Replacements		Cost of Halogen over Induction Life		Induction Replacements Over Lifetime (28 Yrs)	
220	Watt	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	3	3		3
Metal Halide vs. Fluorescent		Metal Halide Cost		Fluorescent Cost		Metal Halide Average Lifetime (Years)		Fluorescent Average Lifetime (Years)		Quantity of Metal Halide Replacements vs. Fluorescent Replacements		Cost of Metal Halide Replacements over Fluorescent Life		Fluorescent Replacements Over Lifetime (28 Yrs)	
3	Lamp	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	2	2		2
4	Lamp	\$20.0	\$20.0	\$20.0	5.0	5.0	5.0	5.0	5.0	1.0	\$20.0	2	2		2

Building	INC-CFL (13M)	INC-CFL (20M)	INC-CFL (20M)	T12 +T8 (2 Lamp)	T12 +T8 (2 Lamp)	T12 +T8 (2 Lamp)	HD +FL (9 Lamp)	T5W HD +INC/DUCT	20W HD +INC/DUCT	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Water Department - 25 2000 House - Interior	\$288.9	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$288.9	\$28.89	Water Department - 25 2000 House - Interior
Water Department - Chemical and Control - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Water Department - Chemical and Control - Interior
Water Department - Generator - Interior	\$0.0	\$0.0	\$0.0	\$183.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$183.7	\$18.37	Water Department - Generator - Interior
Water Control - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Water Control - Interior
Parking Garage - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Parking Garage - Interior

Building	ICC-CPL (2000)	ICC-CPL (2000)	ICC-CPL (2000)	T22 - /T9 (2 Lame)	T22 - /T9 (2 Lame)	T22 - /T9 (2 Lame)	MD - /T9 (2 Lame)	Total Maintenance	Amount Maintenance	Building
								Cost Expenses	Cost Expenses	
Water Department - 4th Ward House - Exterior	\$338.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	Water Department - 4th Ward House - Exterior
Water Department - 4th Ward House - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	Water Department - 4th Ward House - Interior
Water Department - Chemical and Control - Exterior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	Water Department - Chemical and Control - Exterior
Water Department - Chemical and Control - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	Water Department - Chemical and Control - Interior
Public Canal - Exterior	\$7,376.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$16,412.0	\$0.0	Public Canal - Exterior
Public Canal - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	Public Canal - Interior
Public Canal - Equipment	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	Public Canal - Equipment

[illegible]

Lighting Maintenance Cost Savings

T12 to T8 Retrofit		T12 Bulb Cost	T8 Blub Cost	T12 Bulb Average Lifetime (Years)	T8 Bulb Average Lifetime (Years)	Quantity of T12 Replacements vs. T8 Replacements	Cost of T12 Replacement over T8 Life	T8 Bulb Replacements Over Lifetime (15 Yrs)
1	Lamp	\$25.0	\$23.5	4.6	5.7	1.25	\$31.2	3
2	Lamp	\$69.9	\$67.0	4.6	5.7	1.25	\$87.4	3
3	Lamp	\$94.9	\$90.5	4.6	5.7	1.25	\$118.6	3
4	Lamp	\$119.8	\$114.0	4.6	5.7	1.25	\$149.8	3
Incandescent to CFL Retrofit		Incandescent Cost	CFL Cost	Incandescent Average Lifetime (Years)	CFL Average Lifetime (Years)	Quantity of Incandescent Replacements vs. CFL Replacements	Cost of Incandescent Replacement over CFL Life	CFL Replacements Over Lifetime (15 Yrs)
13	Watt	\$13.0	\$25.0	0.5	2.3	5	\$65.0	7
25	Watt	\$18.0	\$27.0	0.5	2.3	5	\$90.0	7
26	Watt	\$19.0	\$28.5	0.5	2.3	5	\$95.0	7
65	Watt	\$20.0	\$37.0	0.5	2.3	5	\$100.0	7
120	Watt	\$22.0	\$48.5	0.5	2.3	5	\$110.0	7
Metal Halide to Induction Retrofit		Metal Halide Cost	Induction Cost	Metal Halide Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of Metal Halide Replacements vs. Induction Replacements	Cost of Metal Halide Replacement over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
400	Watt	\$86.0	\$485.0	4.6	22.8	5	\$430.0	1
250	Watt	\$80.0	\$390.0	4.6	22.8	5	\$400.0	1
HPS to Induction Retrofit		HPS Cost	Induction Cost	HPS Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of HPS Replacements vs. Induction Replacements	Cost of HPS over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
250	Watt	\$80.0	\$390.0	4.6	22.8	5	\$400.0	1
175	Watt	\$78.0	\$390.0	4.6	22.8	5	\$390.0	1
150	Watt	\$74.0	\$380.0	4.6	22.8	5	\$370.0	1
100	Watt	\$55.0	\$380.0	4.6	22.8	5	\$275.0	1
70	Watt	\$25.0	\$380.0	4.6	22.8	5	\$125.0	1
Halogen to Induction Retrofit		Halogen Cost	Induction Cost	Halogen Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of Halogen Replacements vs. Induction Replacements	Cost of Halogen over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
500	Watt	\$20.0	\$390.0	0.2	22.8	114.1552511	\$2,283.1	1
Metal Halide to Fluorescent		Metal Halide Cost	Fluorescent Cost	Metal Halide Average Lifetime (years)	Fluorescent Average Lifetime (years)	Quantity of Metal Halide Replacements vs. Fluorescent Replacements	Cost of Metal Halide Replacement over Fluorescent Life	Replacements Over Lifetime (15 Yrs)
6	Lamp	\$86.0	\$288.0	4.6	5.7	1.25	\$107.5	3
4	Lamp	\$48.0	\$174.0	4.6	5.7	1.25	\$60.0	3

Interior & Exterior

Building	INC-CFL (13W)	INC-CFL (25W)	INC-CFL (26W)	T12->T8 (1 Lamp)	T12->T8 (2 Lamp)	T12->T8 (3 Lamp)	HID->FL (6 Lamp)	70W HID->INUCTION	250W HID->INUCTION	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Parks and Recreation - Rockwell Park - Interior	\$2,192.2	\$0.0	\$0.0	\$0.0	\$918.5	\$0.0	\$0.0	\$11.0	\$0.0	\$3,121.6	\$208.11	Parks and Recreation - Rockwell Park - Interior
Parks and Recreation - Rockwell Pavilion - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Parks and Recreation - Rockwell Pavilion - Interior
Parks and Recreation - Bathhouse - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Parks and Recreation - Bathhouse - Interior
Parks and Recreation - Muzzy Field - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$1,882.9	\$0.0	\$0.0	\$0.0	\$0.0	\$1,882.9	\$125.53	Parks and Recreation - Muzzy Field - Interior
Parks and Recreation - Ski Lodge - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Parks and Recreation - Ski Lodge - Interior
Parks and Recreation - Page Park Pavillion - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Parks and Recreation - Page Park Pavillion - Interior
Parks and Recreation - Recreation Building - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Parks and Recreation - Recreation Building - Interior
Bristol Fire - Fire HQ - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Bristol Fire - Fire HQ - Interior
Bristol Fire - Engine 2 - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Bristol Fire - Engine 2 - Interior
Bristol Fire - Engine 3 - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Bristol Fire - Engine 3 - Interior

Interior

Building	INC-CFL (13W)	INC-CFL (25W)	INC-CFL (26W)	T12->T8 (1 Lamp)	T12->T8 (2 Lamp)	T12->T8 (3 Lamp)	HID->FL (6 Lamp)	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Parks and Recreation - Rockwell Park - Exterior	\$2,192.2	\$0.0	\$0.0	\$0.0	\$918.5	\$0.0	\$0.0	\$3,110.7	\$207.38	Parks and Recreation - Rockwell Park - Exterior
Parks and Recreation - Rockwell Pavillion - Exterior	\$398.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$398.6	\$26.57	Parks and Recreation - Rockwell Pavillion - Exterior
Parks and Recreation - Bathhouse - Exterior	\$3,188.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$3,188.6	\$212.58	Parks and Recreation - Bathhouse - Exterior
Parks and Recreation - Muzzy Field - Exterior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	\$0.00	Parks and Recreation - Muzzy Field - Exterior
Parks and Recreation - Ski Lodge - Exterior	\$398.6	\$0.0	\$0.0	\$0.0	\$0.0	\$373.9	\$0.0	\$772.5	\$51.50	Parks and Recreation - Ski Lodge - Exterior
Parks and Recreation - Page Park Pavillion - Exterior	\$398.6	\$0.0	\$0.0	\$65.6	\$734.8	\$0.0	\$0.0	\$1,198.9	\$79.93	Parks and Recreation - Page Park Pavillion - Exterior
Parks and Recreation - Recreation Building - Exterior	\$1,195.7	\$551.9	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,747.6	\$116.51	Parks and Recreation - Recreation Building - Exterior
Bristol Fire - Fire HQ - Exterior	\$996.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$996.5	\$66.43	Bristol Fire - Fire HQ - Exterior
Bristol Fire - Engine 2 - Exterior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Bristol Fire - Engine 2 - Exterior
Bristol Fire - Engine 3 - Exterior	\$996.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$996.5	\$66.43	Bristol Fire - Engine 3 - Exterior

Exterior

Building	INC-CFL (25W)	70W HID->INUCTION	500W QUARTZ->INUCTION	250W HID->INUCTION	400W HID->INUCTION	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Parks and Recreation - Rockwell Park - Total	\$0.0	\$11.0	\$0.0	\$0.0	\$0.0	\$0.73	\$0.73	Parks and Recreation - Rockwell Park - Total
Parks and Recreation - Rockwell Pavillion - Total	\$0.0	\$5.5	\$0.0	\$0.0	\$0.0	\$0.73	\$0.73	Parks and Recreation - Rockwell Pavillion - Total
Parks and Recreation - Bathhouse - Total	\$0.0	\$5.5	\$0.0	\$0.0	\$0.0	\$5.5	\$0.37	Parks and Recreation - Bathhouse - Total
Parks and Recreation - Muzzy Field - Total	\$0.0	\$0.0	\$0.0	\$52.6	\$70.1	\$0.0	\$0.00	Parks and Recreation - Muzzy Field - Total
Parks and Recreation - Ski Lodge - Total	\$0.0	\$11.0	\$0.0	\$0.0	\$0.0	\$11.0	\$0.73	Parks and Recreation - Ski Lodge - Total
Parks and Recreation - Page Park Pavillion - Total	\$0.0	\$11.0	\$0.0	\$0.0	\$0.0	\$11.0	\$0.73	Parks and Recreation - Page Park Pavillion - Total
Parks and Recreation - Recreation Building - Total	\$0.0	\$5.5	\$0.0	\$0.0	\$0.0	\$0.73	\$0.37	Parks and Recreation - Recreation Building - Total
Bristol Fire - Fire HQ - Total	\$0.0	\$32.9	\$0.0	\$0.0	\$0.0	\$32.9	\$2.19	Bristol Fire - Fire HQ - Total
Bristol Fire - Engine 2 - Total	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	\$0.00	Bristol Fire - Engine 2 - Total
Bristol Fire - Engine 3 - Total	\$0.0	\$0.0	\$100.0	\$0.0	\$0.0	\$100.0	\$6.67	Bristol Fire - Engine 3 - Total

Lighting Maintenance Cost Savings

T12 to T8 Retrofit		T12 Bulb Cost	T8 Blub Cost	T12 Bulb Average Lifetime (Years)	T8 Bulb Average Lifetime (Years)	Quantity of T12 Replacements vs. T8 Replacements	Cost of T12 Replacement over T8 Life	T8 Bulb Replacements Over Lifetime (15 Yrs)
1	Lamp	\$25.0	\$23.5	4.6	5.7	1.25	\$31.2	3
2	Lamp	\$69.9	\$67.0	4.6	5.7	1.25	\$87.4	3
3	Lamp	\$94.9	\$90.5	4.6	5.7	1.25	\$118.6	3
4	Lamp	\$119.8	\$114.0	4.6	5.7	1.25	\$149.8	3

Incandescent to CFL Retrofit		Incandescent Cost	CFL Cost	Incandescent Average Lifetime (Years)	CFL Average Lifetime (Years)	Quantity of Incandescent Replacements vs. CFL Replacements	Cost of Incandescent Replacement over CFL Life	CFL Replacements Over Lifetime (15 Yrs)
13	Watt	\$13.0	\$25.0	0.5	2.3	5	\$65.0	7
25	Watt	\$18.0	\$27.0	0.5	2.3	5	\$90.0	7
26	Watt	\$19.0	\$28.5	0.5	2.3	5	\$95.0	7
65	Watt	\$20.0	\$37.0	0.5	2.3	5	\$100.0	7
120	Watt	\$22.0	\$48.5	0.5	2.3	5	\$110.0	7

Metal Halide to Induction Retrofit		Metal Halide Cost	Induction Cost	Metal Halide Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of Metal Halide Replacements vs. Induction Replacements	Cost of Metal Halide Replacement over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
400	Watt	\$86.0	\$485.0	4.6	22.8	5	\$430.0	1
250	Watt	\$80.0	\$390.0	4.6	22.8	5	\$400.0	1

HPS to Induction Retrofit		HPS Cost	Induction Cost	HPS Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of HPS Replacements vs. Induction Replacements	Cost of HPS over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
250	Watt	\$80.0	\$390.0	4.6	22.8	5	\$400.0	1
175	Watt	\$78.0	\$380.0	4.6	22.8	5	\$390.0	1
150	Watt	\$74.0	\$380.0	4.6	22.8	5	\$370.0	1
100	Watt	\$55.0	\$380.0	4.6	22.8	5	\$275.0	1
70	Watt	\$25.0	\$380.0	4.6	22.8	5	\$125.0	1

Halogen to Induction Retrofit		Halogen Cost	Induction Cost	Halogen Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of Halogen Replacements vs. Induction Replacements	Cost of Halogen over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
500	Watt	\$20.0	\$390.0	0.2	22.8	114.1552511	\$2,283.1	1

Metal Halide to Fluorescent		Metal Halide Cost	Fluorescent Cost	Metal Halide Average Lifetime (Years)	Fluorescent Average Lifetime (Years)	Quantity of Metal Halide Replacements vs. Fluorescent Replacements	Cost of Metal Halide Replacement over Fluorescent Life	Replacements Over Lifetime (15 Yrs)
6	Lamp	\$86.0	\$288.0	4.6	5.7	1.25	\$107.5	3
4	Lamp	\$48.0	\$174.0	4.6	5.7	1.25	\$60.0	3

Interior & Exterior

Building	INC-CFL (13W)	INC-CFL (25W)	INC-CFL (26W)	T12->T8 (1 Lamp)	T12->T8 (2 Lamp)	T12->T8 (3 Lamp)	HID->FL (6 Lamp)	150W HID->INUCTION	250W HID->INUCTION	70W HID->INUCTION	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Bristol Fire - Engine 4 - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$38.3	\$0.0	\$0.00	Bristol Fire - Engine 4 - Interior
Bristol Fire - Engine 5 - Interior	\$1,793.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$119.57	\$1,809.8	Bristol Fire - Engine 5 - Interior
Senior Center - Interior	\$1,395.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$142.4	\$1,395.0	\$93.00	Senior Center - Interior
Main Library - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$16.4	Main Library - Interior
Public Library - Interior	\$1,992.9	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$27.4	\$1,992.9	\$132.86	Public Library - Interior
Youth Services - Main Building - Interior	\$1,195.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$18.4	\$1,195.7	\$79.72	Youth Services - Main Building - Interior
Public Works - Animal Control - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$16.2	\$0.0	\$1.08	Public Works - Animal Control - Interior
Public Works - Community - Interior	\$398.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$398.6	\$26.57	Public Works - Community - Interior
Public Works - Hill Street - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$780.7	\$0.0	\$0.0	\$32.4	\$0.0	\$0.0	\$813.1	\$54.21	Public Works - Hill Street - Interior
Public Works - City Yard - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$5.5	\$0.0	\$0.00	Public Works - City Yard - Interior

Interior

Building	INC-CFL (13W)	INC-CFL (25W)	INC-CFL (26W)	T12->T8 (1 Lamp)	T12->T8 (2 Lamp)	T12->T8 (3 Lamp)	HID->FL (6 Lamp)	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Bristol Fire - Engine 4 - Exterior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Bristol Fire - Engine 4 - Exterior
Bristol Fire - Engine 5 - Exterior	\$1,793.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,793.6	\$119.57	Bristol Fire - Engine 5 - Exterior
Senior Center - Exterior	\$996.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$996.5	\$66.43	Senior Center - Exterior
Main Library - Exterior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Main Library - Exterior
Public Library - Exterior	\$1,195.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,195.7	\$79.72	Public Library - Exterior
Youth Services - Main Building - Exterior	\$1,195.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1,195.7	\$79.72	Youth Services - Main Building - Exterior
Public Works - Animal Control - Exterior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Public Works - Animal Control - Exterior
Public Works - Community - Exterior	\$398.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$398.6	\$26.57	Public Works - Community - Exterior
Public Works - Hill Street - Exterior	\$0.0	\$0.0	\$0.0	\$0.0	\$780.7	\$0.0	\$0.0	\$780.7	\$52.05	Public Works - Hill Street - Exterior
Public Works - City Yard - Exterior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Public Works - City Yard - Exterior

Exterior

Building	INC-CFL (13W)	150W HID->INUCTION	250W HID->INUCTION	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Bristol Fire - Engine 4 - Total	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Bristol Fire - Engine 4 - Total
Bristol Fire - Engine 5 - Total	\$0.0	\$16.2	\$0.0	\$16.2	\$1.08	Bristol Fire - Engine 5 - Total
Senior Center - Total	\$398.6	\$0.0	\$0.0	\$398.6	\$26.57	Senior Center - Total
Main Library - Total	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Main Library - Total
Public Library - Total	\$797.2	\$0.0	\$0.0	\$797.2	\$53.14	Public Library - Total
Youth Services - Main Building - Total	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Youth Services - Main Building - Total
Public Works - Animal Control - Total	\$0.0	\$16.2	\$0.0	\$16.2	\$1.08	Public Works - Animal Control - Total
Public Works - Community - Total	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Public Works - Community - Total
Public Works - Hill Street - Total	\$0.0	\$32.4	\$0.0	\$32.4	\$2.16	Public Works - Hill Street - Total
Public Works - City Yard - Total	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Public Works - City Yard - Total

Lighting Maintenance Cost Savings

T12 to T8 Retrofit		T12 Bulb Cost	T8 Blub Cost	T12 Bulb Average Lifetime (Years)	T8 Bulb Average Lifetime (Years)	Quantity of T12 Replacements vs. T8 Replacements	Cost of T12 Replacement over T8 Life	T8 Bulb Replacements Over Lifetime (15 Yrs)
1	Lamp	\$25.0	\$23.5	4.6	5.7	1.25	\$31.2	3
2	Lamp	\$69.9	\$67.0	4.6	5.7	1.25	\$87.4	3
3	Lamp	\$94.9	\$90.5	4.6	5.7	1.25	\$118.6	3
4	Lamp	\$119.8	\$114.0	4.6	5.7	1.25	\$149.8	3

Incandescent to CFL Retrofit		Incandescent Cost	CFL Cost	Incandescent Average Lifetime (Years)	CFL Average Lifetime (Years)	Quantity of Incandescent Replacements vs. CFL Replacements	Cost of Incandescent Replacement over CFL Life	CFL Replacements Over Lifetime (15 Yrs)
13	Watt	\$13.0	\$25.0	0.5	2.3	5	\$65.0	7
25	Watt	\$18.0	\$27.0	0.5	2.3	5	\$90.0	7
26	Watt	\$19.0	\$28.5	0.5	2.3	5	\$95.0	7
65	Watt	\$20.0	\$37.0	0.5	2.3	5	\$100.0	7
120	Watt	\$22.0	\$48.5	0.5	2.3	5	\$110.0	7

Metal Halide to Induction Retrofit		Metal Halide Cost	Induction Cost	Metal Halide Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of Metal Halide Replacements vs. Induction Replacements	Cost of Metal Halide Replacement over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
400	Watt	\$86.0	\$485.0	4.6	22.8	5	\$430.0	1
250	Watt	\$80.0	\$390.0	4.6	22.8	5	\$400.0	1

HPS to Induction Retrofit		HPS Cost	Induction Cost	HPS Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of HPS Replacements vs. Induction Replacements	Cost of HPS over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
250	Watt	\$80.0	\$390.0	4.6	22.8	5	\$400.0	1
175	Watt	\$78.0	\$380.0	4.6	22.8	5	\$390.0	1
150	Watt	\$74.0	\$380.0	4.6	22.8	5	\$370.0	1
100	Watt	\$55.0	\$380.0	4.6	22.8	5	\$275.0	1
70	Watt	\$25.0	\$380.0	4.6	22.8	5	\$125.0	1

Halogen to Induction Retrofit		Halogen Cost	Induction Cost	Halogen Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of Halogen Replacements vs. Induction Replacements	Cost of Halogen over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
500	Watt	\$20.0	\$390.0	0.2	22.8	114.1552511	\$2,283.1	1

Metal Halide to Fluorescent		Metal Halide Cost	Fluorescent Cost	Metal Halide Average Lifetime (Years)	Fluorescent Average Lifetime (years)	Quantity of Metal Halide Replacements vs. Fluorescent Replacements	Cost of Metal Halide Replacement over Fluorescent Life	Replacements Over Lifetime (15 Yrs)
6	Lamp	\$86.0	\$288.0	4.6	5.7	1.25	\$107.5	3
4	Lamp	\$48.0	\$174.0	4.6	5.7	1.25	\$60.0	3

Interior & Exterior

Building	INC-CFL (13W)	INC-CFL (25W)	INC-CFL (26W)	T12->T8 (1 Lamp)	T12->T8 (2 Lamp)	T12->T8 (3 Lamp)	HID->FL (6 Lamp)	70W HID->INCUCTION	250W HID->INCUCTION	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Public Works - Transfer Station Scale House - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$16.2	\$0.0	\$16.2	\$1.08	Public Works - Transfer Station Scale House - Interior
Public Works - Transfer Station Hut - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$5.5	\$0.0	\$0.0	\$0.37	Public Works - Transfer Station Hut - Interior
Water Pollution Control - Operations - Interior	\$199.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$199.3	\$13.29	Water Pollution Control - Operations - Interior
Water Pollution Control - Headworks - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$11.0	\$0.0	\$11.0	\$0.73	Water Pollution Control - Headworks - Interior
Water Pollution Control - Primary - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$5.5	\$0.0	\$5.5	\$0.37	Water Pollution Control - Primary - Interior
Water Pollution Control - Air Blower - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$16.4	\$0.0	\$16.4	\$1.10	Water Pollution Control - Air Blower - Interior
Water Pollution Control - Pump House - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$11.0	\$0.0	\$11.0	\$0.73	Water Pollution Control - Pump House - Interior
Water Pollution Control - Sludge Thickening Building - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$5.5	\$52.6	\$58.0	\$3.87	Water Pollution Control - Sludge Thickening Building - Interior

Interior

Building	INC-CFL (13W)	INC-CFL (25W)	INC-CFL (26W)	T12->T8 (1 Lamp)	T12->T8 (2 Lamp)	T12->T8 (3 Lamp)	HID->FL (6 Lamp)	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Public Works - Transfer Station Scale House - Exterior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Public Works - Transfer Station Scale House - Exterior
Public Works - Transfer Station Hut - Exterior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Public Works - Transfer Station Hut - Exterior
Water Pollution Control - Operations - Exterior	\$199.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$199.3	\$13.29	Water Pollution Control - Operations - Exterior

Exterior

Building	INC-CFL (25W)	70W HID->INCUCTION	250W HID->INCUCTION	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Public Works - Transfer Station Scale House - Total	\$0.0	\$16.2	\$0.0	\$16.2	\$1.08	Public Works - Transfer Station Scale House - Total
Public Works - Transfer Station Hut - Total	\$0.0	\$5.5	\$0.0	\$5.5	\$0.37	Public Works - Transfer Station Hut - Total
Water Pollution Control - Headworks - Total	\$0.0	\$11.0	\$0.0	\$11.0	\$0.73	Water Pollution Control - Headworks - Total
Water Pollution Control - Primary - Total	\$0.0	\$5.5	\$0.0	\$5.5	\$0.37	Water Pollution Control - Primary - Total
Water Pollution Control - Air Blower - Total	\$0.0	\$16.4	\$0.0	\$16.4	\$1.10	Water Pollution Control - Air Blower - Total
Water Pollution Control - Pump House - Total	\$0.0	\$11.0	\$0.0	\$11.0	\$0.73	Water Pollution Control - Pump House - Total
Water Pollution Control - Sludge Thickening Building - Total	\$0.0	\$5.5	\$52.6	\$58.0	\$3.87	Water Pollution Control - Sludge Thickening Building - Total

Lighting Maintenance Cost Savings

T12 to T8 Retrofit		T12 Bulb Cost	T8 Blub Cost	T12 Bulb Average Lifetime (Years)	T8 Bulb Average Lifetime (Years)	Quantity of T12 Replacements vs. T8 Replacements	Cost of T12 Replacement over T8 Life	T8 Bulb Replacements Over Lifetime (15 Yrs)
1	Lamp	\$25.0	\$23.5	4.6	5.7	1.25	\$31.2	3
2	Lamp	\$69.9	\$67.0	4.6	5.7	1.25	\$87.4	3
3	Lamp	\$94.9	\$90.5	4.6	5.7	1.25	\$118.6	3
4	Lamp	\$119.8	\$114.0	4.6	5.7	1.25	\$149.8	3

Incandescent to CFL Retrofit		Incandescent Cost	CFL Cost	Incandescent Average Lifetime (Years)	CFL Average Lifetime (Years)	Quantity of Incandescent Replacements vs. CFL Replacements	Cost of Incandescent Replacement over CFL Life	CFL Replacements Over Lifetime (15 Yrs)
13	Watt	\$13.0	\$25.0	0.5	2.3	5	\$65.0	7
25	Watt	\$18.0	\$27.0	0.5	2.3	5	\$90.0	7
26	Watt	\$19.0	\$29.5	0.5	2.3	5	\$95.0	7
65	Watt	\$20.0	\$37.0	0.5	2.3	5	\$100.0	7
120	Watt	\$22.0	\$48.5	0.5	2.3	5	\$110.0	7

Metal Halide to Induction Retrofit		Metal Halide Cost	Induction Cost	Metal Halide Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of Metal Halide Replacements vs. Induction Replacements	Cost of Metal Halide Replacement over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
400	Watt	\$86.0	\$485.0	4.6	22.8	5	\$430.0	1
250	Watt	\$80.0	\$390.0	4.6	22.8	5	\$400.0	1

HPS to Induction Retrofit		HPS Cost	Induction Cost	HPS Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of HPS Replacements vs. Induction Replacements	Cost of HPS over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
250	Watt	\$90.0	\$390.0	4.6	22.8	5	\$400.0	1
175	Watt	\$78.0	\$380.0	4.6	22.8	5	\$390.0	1
150	Watt	\$74.0	\$380.0	4.6	22.8	5	\$370.0	1
100	Watt	\$55.0	\$380.0	4.6	22.8	5	\$275.0	1
70	Watt	\$25.0	\$380.0	4.6	22.8	5	\$125.0	1

Halogen to Induction Retrofit		Halogen Cost	Induction Cost	Halogen Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of Halogen Replacements vs. Induction Replacements	Cost of Halogen over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
500	Watt	\$20.0	\$390.0	0.2	22.8	114.1552511	\$2,283.1	1

Metal Halide to Fluorescent		Metal Halide Cost	Fluorescent Cost	Metal Halide Average Lifetime (Years)	Fluorescent Average Lifetime (years)	Quantity of Metal Halide Replacements vs. Fluorescent Replacements	Cost of Metal Halide Replacement over Fluorescent Life	Replacements Over Lifetime (15 Yrs)
6	Lamp	\$86.0	\$208.0	4.6	5.7	1.25	\$107.5	3
4	Lamp	\$48.0	\$174.0	4.6	5.7	1.25	\$60.0	3

Interior & Exterior

Building	INC-CFL (13W)	INC-CFL (25W)	INC-CFL (26W)	T12->T8 (1 Lamp)	T12->T8 (2 Lamp)	T12->T8 (3 Lamp)	HID->FL (6 Lamp)	70W HID->HNCUCTION	250W HID->HNCUCTION	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Water Pollution Control - Sludge Disposal - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.00	Water Pollution Control - Sludge Disposal - Interior
Water Pollution Control - Broad Street PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$91.8	\$0.0	\$0.0	\$0.0	\$0.0	\$91.8	\$6.12	Water Pollution Control - Broad Street PS - Interior
Water Pollution Control - Cherry Hill PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$91.8	\$0.0	\$0.0	\$0.0	\$0.0	\$91.8	\$6.12	Water Pollution Control - Cherry Hill PS - Interior
Water Pollution Control - Cross PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$183.7	\$0.0	\$0.0	\$0.0	\$0.0	\$183.7	\$12.25	Water Pollution Control - Cross PS - Interior
Water Pollution Control - Drayla PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$183.7	\$0.0	\$0.0	\$0.0	\$0.0	\$183.7	\$12.25	Water Pollution Control - Drayla PS - Interior
Water Pollution Control - East Main PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$45.9	\$0.0	\$0.0	\$0.0	\$0.0	\$45.9	\$3.06	Water Pollution Control - East Main PS - Interior
Water Pollution Control - Ivy PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$45.9	\$0.0	\$0.0	\$0.0	\$0.0	\$45.9	\$3.06	Water Pollution Control - Ivy PS - Interior
Water Pollution Control - Julia PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$45.9	\$0.0	\$0.0	\$0.0	\$0.0	\$45.9	\$3.06	Water Pollution Control - Julia PS - Interior
Water Pollution Control - Lake PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$45.9	\$0.0	\$0.0	\$0.0	\$0.0	\$45.9	\$3.06	Water Pollution Control - Lake PS - Interior
Water Pollution Control - Lufkin PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$45.9	\$0.0	\$0.0	\$0.0	\$0.0	\$45.9	\$3.06	Water Pollution Control - Lufkin PS - Interior

Lighting Maintenance Cost Savings

T12 to T8 Retrofit		T12 Bulb Cost	T8 Blub Cost	T12 Bulb Average Lifetime (Years)	T8 Bulb Average Lifetime (Years)	Quantity of T12 Replacements vs. T8 Replacements	Cost of T12 Replacement over T8 Life	T8 Bulb Replacements Over Lifetime (15 Yrs)
1	Lamp	\$25.0	\$23.5	4.6	5.7	1.25	\$31.2	3
2	Lamp	\$69.9	\$67.0	4.6	5.7	1.25	\$87.4	3
3	Lamp	\$94.9	\$90.5	4.6	5.7	1.25	\$118.6	3
4	Lamp	\$119.8	\$114.0	4.6	5.7	1.25	\$149.8	3

Incandescent to CFL Retrofit		Incandescent Cost	CFL Cost	Incandescent Average Lifetime (Years)	CFL Average Lifetime (Years)	Quantity of Incandescent Replacements vs. CFL Replacements	Cost of Incandescent Replacement over CFL Life	CFL Replacements Over Lifetime (15 Yrs)
13	Watt	\$13.0	\$25.0	0.5	2.3	5	\$65.0	7
25	Watt	\$18.0	\$27.0	0.5	2.3	5	\$90.0	7
26	Watt	\$19.0	\$28.5	0.5	2.3	5	\$95.0	7
65	Watt	\$20.0	\$37.0	0.5	2.3	5	\$100.0	7
120	Watt	\$22.0	\$48.5	0.5	2.3	5	\$110.0	7

Metal Halide to Induction Retrofit		Metal Halide Cost	Induction Cost	Metal Halide Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of Metal Halide Replacements vs. Induction Replacements	Cost of Metal Halide Replacement over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
400	Watt	\$86.0	\$485.0	4.6	22.8	5	\$430.0	1
250	Watt	\$80.0	\$390.0	4.6	22.8	5	\$400.0	1

HPS to Induction Retrofit		HPS Cost	Induction Cost	HPS Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of HPS Replacements vs. Induction Replacements	Cost of HPS over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
250	Watt	\$80.0	\$390.0	4.6	22.8	5	\$400.0	1
175	Watt	\$78.0	\$380.0	4.6	22.8	5	\$390.0	1
150	Watt	\$74.0	\$380.0	4.6	22.8	5	\$370.0	1
100	Watt	\$55.0	\$380.0	4.6	22.8	5	\$275.0	1
70	Watt	\$25.0	\$380.0	4.6	22.8	5	\$125.0	1

Halogen to Induction Retrofit		Halogen Cost	Induction Cost	Halogen Average Lifetime (Years)	Induction Average Lifetime (years)	Quantity of Halogen Replacements vs. Induction Replacements	Cost of Halogen over Induction Life	Induction Replacements Over Lifetime (15 Yrs)
500	Watt	\$20.0	\$390.0	0.2	22.8	114.1552511	\$2,283.1	1

Metal Halide to Fluorescent		Metal Halide Cost	Fluorescent Cost	Metal Halide Average Lifetime (Years)	Fluorescent Average Lifetime (years)	Quantity of Metal Halide Replacements vs. Fluorescent Replacements	Cost of Metal Halide Replacement over Fluorescent Life	Replacements Over Lifetime (15 Yrs)
6	Lamp	\$86.0	\$288.0	4.6	5.7	1.25	\$107.5	3
4	Lamp	\$48.0	\$174.0	4.6	5.7	1.25	\$60.0	3

Interior & Exterior

Building	INC-CFL (13W)	INC-CFL (25W)	INC-CFL (26W)	T12->T8 (1 Lamp)	T12->T8 (2 Lamp)	T12->T8 (3 Lamp)	HID->FL (6 Lamp)	150W HID->INUCTION	250W HID->INUCTION	Total Maintenance Cost Savings	Annual Maintenance Cost Savings	Building
Water Pollution Control - Matthews PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$137.8	\$0.0	\$0.0	\$0.0	\$0.0	\$137.8	\$9.18	Water Pollution Control - Matthews PS - Interior
Water Pollution Control - Middle PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$137.8	\$0.0	\$0.0	\$0.0	\$0.0	\$137.8	\$9.18	Water Pollution Control - Middle PS - Interior
Water Pollution Control - Minor PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$137.8	\$0.0	\$0.0	\$0.0	\$0.0	\$137.8	\$9.18	Water Pollution Control - Minor PS - Interior
Water Pollution Control - Boivin PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$91.8	\$0.0	\$0.0	\$0.0	\$0.0	\$91.8	\$6.12	Water Pollution Control - Boivin PS - Interior
Water Pollution Control - Tyler PS - Interior	\$0.0	\$0.0	\$0.0	\$0.0	\$137.8	\$0.0	\$0.0	\$0.0	\$0.0	\$137.8	\$9.18	Water Pollution Control - Tyler PS - Interior

IRR, NPV, AROI

Inflation Rate: 3%

Motor Upgrades Water Pollution Control Plant (WPCP)		Motor Upgrades WPCP Pump Stations		Motor Upgrades WTP - High Service Pump Station		Motor Upgrades WTP - Pump Station and Well Houses	
Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15		Life of ECRM (Yrs): 15	
Year	Cash Flow	Year	Cash Flow	Year	Cash Flow	Year	Cash Flow
0	(\$238,423.63)	0	(\$298,093.06)	0	(\$31,809.75)	0	(\$82,199.38)
1	\$21,696.85	1	\$20,470.17	1	\$1,248.73	1	\$7,624.33
2	\$22,347.76	2	\$21,084.27	2	\$1,286.20	2	\$7,853.06
3	\$23,018.19	3	\$21,716.80	3	\$1,324.78	3	\$8,088.65
4	\$23,708.74	4	\$22,368.31	4	\$1,364.53	4	\$8,331.31
5	\$24,420.00	5	\$23,039.36	5	\$1,405.46	5	\$8,581.25
6	\$25,152.60	6	\$23,730.54	6	\$1,447.63	6	\$8,838.69
7	\$25,907.18	7	\$24,442.45	7	\$1,491.05	7	\$9,103.85
8	\$26,684.39	8	\$25,175.73	8	\$1,535.79	8	\$9,376.96
9	\$27,484.93	9	\$25,931.00	9	\$1,581.86	9	\$9,658.27
10	\$28,309.47	10	\$26,708.93	10	\$1,629.31	10	\$9,948.02
11	\$29,158.76	11	\$27,510.20	11	\$1,678.19	11	\$10,246.46
12	\$30,033.52	12	\$28,335.50	12	\$1,728.54	12	\$10,553.86
13	\$30,934.53	13	\$29,185.57	13	\$1,780.40	13	\$10,870.47
14	\$31,862.56	14	\$30,061.13	14	\$1,833.81	14	\$11,196.59
15	\$32,818.44	15	\$30,962.97	15	\$1,888.82	15	\$11,532.48
IRR	6.86%	IRR	3.00%	IRR	-3.48%	IRR	7.14%
NPV	\$77,549.98	NPV	\$16.20	NPV	(\$13,624.30)	NPV	\$28,834.56
AROI	2.43%	AROI	0.20%	AROI	-2.74%	AROI	2.61%

Motor Upgrade ECM	Water Pollution Control Plant (WPCP)	WPCP Pump Stations	WTP - High Service Pump Station	WTP - Pump Station and Well Houses
Assumed Inflation (Gas)	2%	2%	2%	2%
Initial Yearly Savings (Gas)	\$0.00	\$0.00	\$0.00	\$0.00
Assumed Inflation (Electricity)	3%	3%	3%	3%
Initial Yearly Savings (Electricity)	\$21,696.85	\$20,470.17	\$1,248.73	\$7,624.33
Assumed Average Useful Life (Years)	15	15	15	15
Lifetime Savings	\$403,537.93	\$380,722.91	\$23,225.10	\$141,804.26
<u>Year</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>	<u>Annual Savings</u>
1	\$21,696.85	\$20,470.17	\$1,248.73	\$7,624.33
2	\$22,347.76	\$21,084.27	\$1,286.20	\$7,853.06
3	\$23,018.19	\$21,716.80	\$1,324.78	\$8,088.65
4	\$23,708.74	\$22,368.31	\$1,364.53	\$8,331.31
5	\$24,420.00	\$23,039.36	\$1,405.46	\$8,581.25
6	\$25,152.60	\$23,730.54	\$1,447.63	\$8,838.69
7	\$25,907.18	\$24,442.45	\$1,491.05	\$9,103.85
8	\$26,684.39	\$25,175.73	\$1,535.79	\$9,376.96
9	\$27,484.93	\$25,931.00	\$1,581.86	\$9,658.27
10	\$28,309.47	\$26,708.93	\$1,629.31	\$9,948.02
11	\$29,158.76	\$27,510.20	\$1,678.19	\$10,246.46
12	\$30,033.52	\$28,335.50	\$1,728.54	\$10,553.86
13	\$30,934.53	\$29,185.57	\$1,780.40	\$10,870.47
14	\$31,862.56	\$30,061.13	\$1,833.81	\$11,196.59
15	\$32,818.44	\$30,962.97	\$1,888.82	\$11,532.48

APPENDIX M

Engineer's Opinion of Probable Construction Costs

CDM

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

50 Hampshire St, 5th Floor
Cambridge, MA 02139
Phone (617) 452-6592
Fax (617) 452-6592

Location: Bristol CT WPCF
ITEM **Anoxic Zone Mixers**
Estimate by: Elizabeth Watson
Checked by: CK

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Invent mixers, HCM/2500-22-5.0HP	4	ea	\$ 22,250.00	\$ 89,000.00	120	hrs	\$ 70.00	\$ 8,400.00	\$ 97,400.00
2	Instrumentation and Controls	1	l.s.	\$ 5,000.00	\$ 5,000.00	80	hrs	\$ 70.00	\$ 5,600.00	\$ 10,600.00
3	Electrical Work	1	l.s.	\$ 10,000.00	\$ 10,000.00	80	hrs	\$ 70.00	\$ 5,600.00	\$ 15,600.00
4	Demolition of existing Submersible Mixers	1	ls	\$ -	\$ -	40	hrs	\$ 70.00	\$ 2,800.00	\$ 2,800.00
5	Equipment Bridges/Supports	1	ls	\$ 50,000.00	\$ 50,000.00	70	hrs	\$ 70.00	\$ 4,900.00	\$ 54,900.00
	Subtotal				154,000.00				27,300.00	

SUBTOTAL = \$ 181,300.00

MARKUP % = \$ 0.20

MARKUP = \$ 36,260.00

SUB-TOTAL w/ OH & P = \$ 217,560.00

CONTINGENCY % = 0.30

CONTINGENCY = \$ 65,268.00

BUDGET COST ESTIMATE = \$ 282,828.00

Notes:

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CDM**ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST**

50 Hampshire St, 5th Floor
 Cambridge, MA 02139
 Phone (617) 452-6592
 Fax (617) 452-6592

Location: Bristol CT WPCF
ITEM Anoxic Zone Mixers
 Estimate by: Elizabeth Watson
 Checked by: CK

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	BioMx large bubble mixing system	1	ea	\$ 163,000.00	\$ 163,000.00	820	hrs	\$ 70.00	\$ 57,400.00	\$ 220,400.00
2	Instrumentation and Controls	1	l.s.	\$ 20,000.00	\$ 20,000.00	120	hrs	\$ 70.00	\$ 8,400.00	\$ 28,400.00
3	Electrical Work	1	l.s.	\$ 20,000.00	\$ 20,000.00	120	hrs	\$ 70.00	\$ 8,400.00	\$ 28,400.00
4	Demolition of existing Submersible Mixers	1	ls	\$ -	\$ -	40	hrs	\$ 70.00	\$ 2,800.00	\$ 2,800.00
	Subtotal				203,000.00				77,000.00	

SUBTOTAL = \$ 280,000.00

MARKUP % = \$ 0.20

MARKUP = \$ 56,000.00

SUB-TOTAL w/ OH & P = \$ 336,000.00

CONTINGENCY % = 0.30

CONTINGENCY = \$ 100,800.00

BUDGET COST ESTIMATE = \$ 436,800.00

Notes:

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CDM

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

100 Crossways Park West, Suite 415
 Woodbury, NY 11797
 Phone (516) 496-8400
 Fax (516) 4968864

Location: Bristol CT WPCF
 ITEM **Option 1: New Turbo Blowers w/VFDs**

Estimate by: MM
 Checked by: CK

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Turbo Blowers (includes VFDs)	2	ea.	\$ 196,000.00	\$ 392,000.00	64	hrs.	\$ 70.00	\$ 4,480.00	\$ 396,480.00
2	Remove existing blowers	2	ea.	\$ -	\$ -	110	hrs.	\$ 70.00	\$ 7,700.00	\$ 7,700.00
3	Rigging	2	ea.	\$ 5,000.00	\$ 10,000.00	2	ea	\$ 5,000.00	\$ 10,000.00	\$ 20,000.00
4	New Piping	2	ea.	\$ 15,000.00	\$ 30,000.00				\$ -	\$ 30,000.00
5	Blower Instrumentation and Controls	2	ea.	\$ 30,000.00	\$ 60,000.00				\$ -	\$ 60,000.00
6	Electrical Work	2	ea.	\$ 10,000.00	\$ 20,000.00				\$ -	\$ 20,000.00
7	System Testing	2	ea.	\$ 6,000.00	\$ 12,000.00	120	hrs.	\$ 70.00	\$ 8,400.00	\$ 20,400.00
	Subtotal			\$ -	\$ 392,000.00				\$ 4,480.00	\$ -

SUBTOTAL = \$ 554,580.00

OH&P 20 % = \$ 0.20

MARKUP = \$ 110,916.00

SUB-TOTAL w/ OH & P = \$ 665,496.00

CONTINGENCY % = 0.30

CONTINGENCY = \$ 199,648.80

BUDGET COST ESTIMATE = \$ 865,144.80

1. The Engineer's Opinion of Probable Construction Cost Estimates presented in this Appendix is an Opinion of Probable Construction Cost only. CDM has no control over the cost of labor, materials, equipment, or services furnished, over schedules, over contractor's methods of determining prices, competitive bidding, market conditions or negotiating terms. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids. There are not any costs provided for: Change Orders, Design Engineering, Construction Oversight, Client Costs, Finance or Funding Costs, Legal Fees, Land Acquisition or temporary/permanent Easements, Operations, or any other costs associated with this project that are not specifically part of the bidding contractor's proposed scope.

CDM

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

100 Crossways Park West, Suite 415
 Woodbury, NY 11797
 Phone (516) 496-8400
 Fax (516) 4968864

Location: Bristol CT WPCF
ITEM Option 1: Controls Upgrade on UV System

Estimate by: MM
 Checked by: CK

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Controls Upgrade ¹	1	ea.	\$ 75,000.00	\$ 75,000.00		ea.	\$ 1,312.00	\$ -	\$ 75,000.00
2	Electrical Work	2	ls.	\$ 20,000.00	\$ 40,000.00					\$ 40,000.00
	Subtotal				75,000.00				0.00	
SUBTOTAL = \$										115,000.00
OH&P 20 % = \$										0.20
MARKUP = \$										23,000.00
SUB-TOTAL w/ OH & P = \$										138,000.00
CONTINGENCY % =										0.30
CONTINGENCY = \$										41,400.00
BUDGET COST ESTIMATE = \$										179,400.00

1. Lump sum cost estimate was provided from the manufacturer. Cost includes all hardware, programming, start-up and freight charges. An evaluation of the equipment and all communication cards would be necessary to ensure they are in working order and that flow pacing could be reimplemented.

2. The Engineer's Opinion of Probable Construction Cost Estimates presented in this Appendix is an Opinion of Probable Construction Cost only. CDM has no control over the cost of labor, materials, equipment, or services furnished, over schedules, over contractor's methods of determining prices, competitive bidding, market conditions or negotiating terms. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids. There are not any costs provided for: Change Orders, Design Engineering, Construction Oversight, Client Costs, Finance or Funding Costs, Legal Fees, Land Acquisition or temporary/permanent Easements, Operations, or any other costs associated with this project that are not specifically part of the bidding contractor's proposed scope.

CDM

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

50 Hampshire St, 5th Floor
Cambridge, MA 02139
Phone (617) 452-6592
Fax (617) 452-6592

Location: Bristol CT WPCF
ITEM Plant Water System
Estimate by: Elizabeth Watson
Checked by: CK

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	SyncoFlo Packaged Plant Water System	1	ea	\$ 150,000.00	\$ 150,000.00	200	hrs	\$ 70.00	\$ 14,000.00	\$ 164,000.00
2	Instrumentation and Controls	1	l.s.	\$ 10,000.00	\$ 10,000.00				\$ -	\$ 10,000.00
3	Electrical Work	1	l.s.	\$ 10,000.00	\$ 10,000.00				\$ -	\$ 10,000.00
4	Demolition of existing plant water equipment	1	ls	\$ -	\$ -	100	hrs	\$ 70.00	\$ 7,000.00	\$ 7,000.00
	Subtotal				170,000.00				21,000.00	

SUBTOTAL = \$ 191,000.00

MARKUP % = \$ 0.20

MARKUP = \$ 38,200.00

SUB-TOTAL w/ OH & P = \$ 229,200.00

CONTINGENCY % = 0.30

CONTINGENCY = \$ 68,760.00

BUDGET COST ESTIMATE = \$ 297,960.00

Notes:

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CDM**ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST**

50 Hampshire St, 5th Floor
 Cambridge, MA 02139
 Phone (617) 452-6592
 Fax (617) 452-6592

Location: Bristol CT WPCF
ITEM Foam Control
 Estimate by: Elizabeth Watson
 Checked by: CK

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Programmable Timer	1	ea	\$ 1,000.00	\$ 1,000.00	40	hrs	\$ 70.00	\$ 2,800.00	\$ 3,800.00
2	Instrumentation and Controls	1	l.s.	\$ 1,000.00	\$ 1,000.00	0	hrs	\$ 70.00	\$ -	\$ 1,000.00
3	Electrical Work	1	l.s.	\$ 1,000.00	\$ 1,000.00	0	hrs	\$ 70.00	\$ -	\$ 1,000.00
	Subtotal				3,000.00				2,800.00	

SUBTOTAL = \$ 5,800.00

MARKUP % = \$ 0.20

MARKUP = \$ 1,160.00

SUB-TOTAL w/ OH & P = \$ 6,960.00

CONTINGENCY % = 0.30

CONTINGENCY = \$ 2,088.00

BUDGET COST ESTIMATE = \$ 9,048.00

Notes:

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CDM

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

100 Crossways Park West, Suite 415
Woodbury, NY 11797
Phone (516) 496-8400
Fax (516) 4968864

Location: Bristol CT WPCF
ITEM **10kW Hydroelectric at Outfall**

Estimate by: MM
Checked by: CK

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	10kW Hydroelectric Turbine	1	ea.	\$ 60,000.00	\$ 60,000.00	480	hrs.	\$ 70.00	\$ 33,600.00	\$ 93,600.00
2	Installation, Penstock & Misc Fittings and Appurtenances	1	ls.	\$ 42,000.00	\$ 42,000.00				\$ -	\$ 42,000.00
3	Electrical Work	1	ls.	\$ 42,000.00	\$ 42,000.00				\$ -	\$ 42,000.00
4	System Testing	1	ls.	\$ 30,000.00	\$ 30,000.00				\$ -	\$ 30,000.00
					\$ -				\$ -	\$ -
	Subtotal				60,000.00				33,600.00	

SUBTOTAL = \$ 207,600.00

OH&P 20 % = \$ 0.20

MARKUP = \$ 41,520.00

SUB-TOTAL w/ OH & P = \$ 249,120.00

CONTINGENCY % = 0.30

CONTINGENCY = \$ 74,736.00

BUDGET COST ESTIMATE = \$ 323,856.00

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2. Length of penstock, location of turbine and length of electrical conduit and wire requires further evaluation.

CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control Plant (WPCP)									
	Motor Upgrades	1	ea.	\$ 196,048.00	\$ 196,048.00	1	ea.	\$ 17,099.00	\$ 17,099.00	\$ 213,147.00
	Subtotal				\$ 196,048.00				\$ 17,099.00	

Notes:

- CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
- CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
- Bonds not included in estimate.
- Escalation not included in estimate.

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SUBTOTAL =	\$	213,147.00
MARKUP % =	\$	0.15
MARKUP =	\$	31,972.05
SUB-TOTAL w/ OH & P =	\$	245,119.05
CONTINGENCY % =		0.25
CONTINGENCY =	\$	61,279.76
BUDGET COST ESTIMATE =	\$	306,398.81

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	WPCP Pump Stations									
	Motor Upgrades	1	ea.	\$ 189,583.00	\$ 189,583.00	1	ea.	\$ 19,880.00	\$ 19,880.00	\$ 209,463.00
	Subtotal				\$ 189,583.00				\$ 19,880.00	

Notes:

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- CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
- Bonds not included in estimate.
- Escalation not included in estimate.

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SUBTOTAL =	\$	209,463.00
MARKUP % =	\$	0.15
MARKUP =	\$	31,419.45
SUB-TOTAL w/ OH & P =	\$	240,882.45
CONTINGENCY % =		0.25
CONTINGENCY =	\$	60,220.61
BUDGET COST ESTIMATE =	\$	301,103.06

CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	WTP - High Service Pump Station									
	Motor Upgrades	1	ea.	\$ 21,840.00	\$ 21,840.00	1	ea.	\$ 1,012.00	\$ 1,012.00	\$ 22,852.00
	Subtotal				\$ 21,840.00				\$ 1,012.00	

Notes:

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- Bonds not included in estimate.
- Escalation not included in estimate.

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SUBTOTAL =	\$	22,852.00
MARKUP % =	\$	0.15
MARKUP =	\$	3,427.80
SUB-TOTAL w/ OH & P =	\$	26,279.80
CONTINGENCY % =		0.25
CONTINGENCY =	\$	6,569.95
BUDGET COST ESTIMATE =	\$	32,849.75

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	WTP - Pump Station and Well Houses									
	Motor Upgrades	1	ea.	\$ 56,212.00	\$ 56,212.00	1	ea.	\$ 2,598.00	\$ 2,598.00	\$ 58,810.00
	Subtotal				\$ 56,212.00				\$ 2,598.00	

Notes:

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- Bonds not included in estimate.
- Escalation not included in estimate.

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SUBTOTAL =	\$	58,810.00
MARKUP % =	\$	0.15
MARKUP =	\$	8,821.50
SUB-TOTAL w/ OH & P =	\$	67,631.50
CONTINGENCY % =		0.25
CONTINGENCY =	\$	16,907.88
BUDGET COST ESTIMATE =	\$	84,539.38

CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	City Hall									
	Solar	1	ea.	\$ 660,158.80	\$ 660,158.80	1	ea.	\$ 282,925.20	\$ 282,925.20	\$ 943,084.00
	Subtotal				\$ 660,158.80				\$ 282,925.20	

SUBTOTAL =	\$	943,084.00
MARKUP % =	\$	0.25
MARKUP =	\$	235,771.00
SUB-TOTAL w/ OH & P =	\$	1,178,855.00

Notes:

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- Bonds not included in estimate.
- Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	City Hall Annex									
	Solar	1	ea.	\$ 211,750.00	\$ 211,750.00	1	ea.	\$ 90,750.00	\$ 90,750.00	\$ 302,500.00
	Subtotal				\$ 211,750.00				\$ 90,750.00	

SUBTOTAL =	\$	302,500.00
MARKUP % =	\$	0.25
MARKUP =	\$	75,625.00
SUB-TOTAL w/ OH & P =	\$	378,125.00

Notes:

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- Bonds not included in estimate.
- Escalation not included in estimate.

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CDM

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Latham, NY 12110
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Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Department Main Office & Garage									
	Solar	1	ea.	\$ 574,000.00	\$ 574,000.00	1	ea.	\$ 246,000.00	\$ 246,000.00	\$ 820,000.00
	Subtotal				\$ 883.00				\$ 347.50	

SUBTOTAL =	\$	820,000.00
MARKUP % =	\$	0.25
MARKUP =	\$	205,000.00
SUB-TOTAL w/ OH & P =	\$	1,025,000.00

Notes:

- CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
- CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
- Bonds not included in estimate.
- Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Treatment Plant									
	Solar	1	ea.	\$ 2,303,917.00	\$ 2,303,917.00	1	ea.	\$ 987,393.00	\$ 987,393.00	\$ 3,291,310.00
	Subtotal				\$ 2,303,917.00				\$ 987,393.00	

SUBTOTAL =	\$	3,291,310.00
MARKUP % =	\$	0.25
MARKUP =	\$	822,827.50
SUB-TOTAL w/ OH & P =	\$	4,114,137.50

Notes:

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- Bonds not included in estimate.
- Escalation not included in estimate.

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CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Rockwell Park									
	Solar	1	ea.	\$ 133,000.00	\$ 133,000.00	1	ea.	\$ 57,000.00	\$ 57,000.00	\$ 190,000.00
	Subtotal				\$ 133,000.00				\$ 57,000.00	

SUBTOTAL =	\$	190,000.00
MARKUP % =	\$	0.25
MARKUP =	\$	47,500.00
SUB-TOTAL w/ OH & P =	\$	237,500.00

Notes:

- CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
- CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
- Bonds not included in estimate.
- Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Fire HQ									
	Solar	1	ea.	\$ 369,048.40	\$ 369,048.40	1	ea.	\$ 158,163.60	\$ 158,163.60	\$ 527,212.00
	Subtotal				\$ 369,048.40				\$ 158,163.60	

SUBTOTAL =	\$	527,212.00
MARKUP % =	\$	0.25
MARKUP =	\$	131,803.00
SUB-TOTAL w/ OH & P =	\$	659,015.00

Notes:

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- Bonds not included in estimate.
- Escalation not included in estimate.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Engine 2									
	Solar	1	ea.	\$ 214,622.80	\$ 214,622.80	1	ea.	\$ 91,981.20	\$ 91,981.20	\$ 306,604.00
	Subtotal				\$ 214,622.80				\$ 91,981.20	

SUBTOTAL = \$ 306,604.00

MARKUP % = \$ 0.25

MARKUP = \$ 76,651.00

SUB-TOTAL w/ OH & P = \$ 383,255.00

Notes:

- CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
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- Bonds not included in estimate.
- Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Engine 3									
	Solar	1	ea.	\$ 171,959.20	\$ 171,959.20	1	ea.	\$ 73,696.80	\$ 73,696.80	\$ 245,656.00
	Subtotal				\$ 171,959.20				\$ 73,696.80	

SUBTOTAL = \$ 245,656.00

MARKUP % = \$ 0.25

MARKUP = \$ 61,414.00

SUB-TOTAL w/ OH & P = \$ 307,070.00

Notes:

- CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
- CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
- Bonds not included in estimate.
- Escalation not included in estimate.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Engine 4									
	Solar	1	ea.	\$ 227,525.20	\$ 227,525.20	1	ea.	\$ 97,510.80	\$ 97,510.80	\$ 325,036.00
	Subtotal				\$ 227,525.20				\$ 97,510.80	

SUBTOTAL =	\$	325,036.00
MARKUP % =	\$	0.25
MARKUP =	\$	81,259.00
SUB-TOTAL w/ OH & P =	\$	406,295.00

Notes:

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- Bonds not included in estimate.
- Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Engine 5									
	Solar	1	ea.	\$ 222,145.00	\$ 222,145.00	1	ea.	\$ 95,205.00	\$ 95,205.00	\$ 317,350.00
	Subtotal				\$ 222,145.00				\$ 95,205.00	

SUBTOTAL =	\$	317,350.00
MARKUP % =	\$	0.25
MARKUP =	\$	79,337.50
SUB-TOTAL w/ OH & P =	\$	396,687.50

Notes:

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- Bonds not included in estimate.
- Escalation not included in estimate.

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Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Senior Center									
	Solar	1	ea.	\$ 2,090,939.20	\$ 2,090,939.20	1	ea.	\$ 896,116.80	\$ 896,116.80	\$ 2,987,056.00
	Subtotal				\$ 2,090,939.20				\$ 896,116.80	

SUBTOTAL = \$ 2,987,056.00

MARKUP % = \$ 0.25

MARKUP = \$ 746,764.00

SUB-TOTAL w/ OH & P = \$ 3,733,820.00

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Main Library									
	Solar	1	ea.	\$ 197,190.70	\$ 197,190.70	1	ea.	\$ 84,510.30	\$ 84,510.30	\$ 281,701.00
	Subtotal				\$ 197,190.70				\$ 84,510.30	

SUBTOTAL = \$ 281,701.00

MARKUP % = \$ 0.25

MARKUP = \$ 70,425.25

SUB-TOTAL w/ OH & P = \$ 352,126.25

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Animal Control									
	Solar	1	ea.	\$ 160,720.00	\$ 160,720.00	1	ea.	\$ 68,880.00	\$ 68,880.00	\$ 229,600.00
	Subtotal				\$ 883.00				\$ 347.50	

SUBTOTAL = \$ 229,600.00

MARKUP % = \$ 0.25

MARKUP = \$ 57,400.00

SUB-TOTAL w/ OH & P = \$ 287,000.00

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	City Yard									
	Solar	1	ea.	\$ 929,572.00	\$ 929,572.00	1	ea.	\$ 398,388.00	\$ 398,388.00	\$ 1,327,960.00
	Subtotal				\$ 929,572.00				\$ 398,388.00	

SUBTOTAL = \$ 1,327,960.00

MARKUP % = \$ 0.25

MARKUP = \$ 331,990.00

SUB-TOTAL w/ OH & P = \$ 1,659,950.00

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Plant									
	Solar	1	ea.	\$ 11,944,807.00	\$ 11,944,807.00	1	ea.	\$ 5,119,203.00	\$ 5,119,203.00	\$ 17,064,010.00
	Subtotal				\$ 11,944,807.00				\$ 5,119,203.00	

SUBTOTAL = \$ 17,064,010.00

MARKUP % = \$ 0.25

MARKUP = \$ 4,266,002.50

SUB-TOTAL w/ OH & P = \$ 21,330,012.50

Notes:

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- Bonds not included in estimate.
- Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Broad St Pump Station									
	Solar	1	ea.	\$ 251,440.00	\$ 251,440.00	1	ea.	\$ 107,760.00	\$ 107,760.00	\$ 359,200.00
	Subtotal				\$ 251,440.00				\$ 107,760.00	

SUBTOTAL = \$ 359,200.00

MARKUP % = \$ 0.25

MARKUP = \$ 89,800.00

SUB-TOTAL w/ OH & P = \$ 449,000.00

Notes:

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- Bonds not included in estimate.
- Escalation not included in estimate.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Cherry Hill Pump Station									
	Solar	1	ea.	\$ 84,175.00	\$ 84,175.00	1	ea.	\$ 36,075.00	\$ 36,075.00	\$ 120,250.00
	Subtotal				\$ 84,175.00				\$ 36,075.00	

SUBTOTAL = \$ 120,250.00

MARKUP % = \$ 0.25

MARKUP = \$ 30,062.50

SUB-TOTAL w/ OH & P = \$ 150,312.50

Notes:

- CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
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- Bonds not included in estimate.
- Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	East Main Pump Station									
	Solar	1	ea.	\$ 112,525.00	\$ 112,525.00	1	ea.	\$ 48,225.00	\$ 48,225.00	\$ 160,750.00
	Subtotal				\$ 112,525.00				\$ 48,225.00	

SUBTOTAL = \$ 160,750.00

MARKUP % = \$ 0.25

MARKUP = \$ 40,187.50

SUB-TOTAL w/ OH & P = \$ 200,937.50

Notes:

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- CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
- Bonds not included in estimate.
- Escalation not included in estimate.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	City Hall									
1	200 Ton, rotary Screw Chiller, Water cooled	1	ea.	\$ 82,000.00	\$ 82,000.00	1	ea.	\$24,500.00	\$24,500.00	\$ 106,500.00
2	Centrifugal Pump, 4 in, 5 HP	4	CLF	\$ 6,925.00	\$ 27,700.00	4	CLF	\$570.00	\$2,280.00	\$ 29,980.00
3	Steel Pipe, 4 in, welded	80	LF	\$ 15.95	\$ 1,276.00	80	LF	\$23.50	\$1,880.00	\$ 3,156.00
4	Valves, 4in, shut off	4	ea.	\$ 233.00	\$ 932.00	4	ea.	\$169.00	\$676.00	\$ 1,608.00
5	Valves, 4 in, Triple duty	4	ea.	\$ 1,025.00	\$ 4,100.00	4	ea.	\$281.00	\$1,124.00	\$ 5,224.00
6	Pipe Insulation, 2 in wall, 4 in pipe	80	ea.	\$ 7.80	\$ 624.00	80	ea.	\$11.40	\$912.00	\$ 1,536.00
	Subtotal				116,632.00				31,372.00	

*Pricing per RS Means COSTWORKS

SUBTOTAL = \$ 148,004.00

MARKUP % = \$ 0.15

MARKUP = \$ 22,200.60

SUB-TOTAL w/ OH & P = \$ 170,204.60

CONTINGENCY % = 0.25

CONTINGENCY = \$ 42,551.15

BUDGET COST ESTIMATE = \$ 212,755.75

**Includes installation cost per RS Means COSTWORKS.

Includes estimated chiller demolition

CLF = 100 linear feet

Notes:

1. This is a Conceptual Level Opinion of Probable Cost only. CDM has no control over the cost of labor, materials, equipment, or services furnished, over schedules, over contractor's methods of determining prices, competitive bidding (at least 3 each - both prime bidders and major subcontractors), market conditions or negotiating terms. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids. There are not any costs provided for: Change Orders, Client Costs, Finance or Funding Costs, Legal Fees, Land Acquisition or temporary/permanent Easements, Operations, or any other costs associated with this project that are not specifically part of the bidding contractor's proposed scope.
2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: MJR
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	City Hall Chilled Water Piping 1.5" Thick Pipe Insulation, 850F Mineral Fiber for 3" Pipe with All Service Jacket	1	ea.	\$ 110.00	\$ 110.00	1	ea.	\$ 154.00	\$ 154.00	\$ 264.00
	Subtotal				110.00				154.00	

*Pricing per CostWorks 2010

SUBTOTAL = \$ 264.00
MARKUP % = \$ 0.15
MARKUP = \$ 39.60
SUB-TOTAL w/ OH & P = \$ 303.60
CONTINGENCY % = 0.25
CONTINGENCY = \$ 75.90
BUDGET COST ESTIMATE = \$ 379.50

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
2	City Hall Make-Up Water Piping 1.5" Thick Pipe Insulation, 850F Mineral Fiber for 1.5" Pipe with All Service Jacket	1	ea.	\$ 33.00	\$ 33.00	1	ea.	\$ 49.00	\$ 49.00	\$ 82.00
	Subtotal				33.00				49.00	

*Pricing per CostWorks 2010

SUBTOTAL = \$ 82.00
MARKUP % = \$ 0.15
MARKUP = \$ 12.30
SUB-TOTAL w/ OH & P = \$ 94.30
CONTINGENCY % = 0.25
CONTINGENCY = \$ 23.58
BUDGET COST ESTIMATE = \$ 117.88

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate
3. This estimate does not consider escalation of costs over time

CDM

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Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	City Hall									
1	Motorized Control Valve, 1-1/2", 3-way, Brass	80	ea.	\$ 560.00	\$ 44,800.00	80	ea.	\$40.50	\$3,240.00	\$ 48,040.00
2	Motorized Damper, 4' x 4',	12	ea.	\$ 760.00	\$ 9,120.00	12	ea.	\$137.00	\$1,644.00	\$ 10,764.00
3	Wire in Conduit, 12/2 w/ground	40	CLF	\$ 128.20	\$ 5,128.00	40	CLF	\$444.50	\$17,780.00	\$ 22,908.00
4	Variable Frequency Drive, 15 HP	1	ea.	\$ 1,875.00	\$ 1,875.00	1	ea.	\$960.00	\$960.00	\$ 2,835.00
	Subtotal				60,923.00				23,624.00	

*Pricing per RS Means COSTWORKS

**Includes installation cost per RS Means COSTWORKS.

Estimate does not include demolition of the existing pneumatics, calibration and integration of new equipment.

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

SUBTOTAL =	\$	84,547.00
MARKUP % =	\$	0.15
MARKUP =	\$	12,682.05
SUB-TOTAL w/ OH & P =	\$	97,229.05
CONTINGENCY % =		0.25
CONTINGENCY =	\$	24,307.26
BUDGET COST ESTIMATE =	\$	121,536.31

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	Bristol City Hall Annex Furnace, Gas-Fired, Condensing High Efficiency 100 MBH	2	ea.	\$ 2,400.00	\$ 4,800.00	2	ea.	\$ 528.00	\$ 1,056.00	\$ 5,856.00
	Subtotal				4,800.00				1,056.00	

*Pricing per vendor

**Includes installation of new furnaces and associated venting.

Does not include disposal of current furnaces, modification of gas piping, electrical, or modifying ductwork

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

SUBTOTAL =	\$	5,856.00
MARKUP % =	\$	0.15
MARKUP =	\$	878.40
SUB-TOTAL w/ OH & P =	\$	6,734.40
CONTINGENCY % =		0.25
CONTINGENCY =	\$	1,683.60
BUDGET COST ESTIMATE =	\$	8,418.00

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	City Hall Computer Room AC, 20 ton, with condenser	1	ea.	\$ 33,800.00	\$ 33,800.00	1	ea.	\$3,500.00	\$3,500.00	\$ 37,300.00
2	Demolition, 20 ton, Computer AC Unit	1	ea.	\$ -	\$ -	1	ea.	\$1,275.00	\$1,275.00	\$ 1,275.00
	Subtotal				33,800.00				4,775.00	

*Pricing per RS Means COSTWORKS

**Includes installation cost per RS Means COSTWORKS.

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

SUBTOTAL =	\$	38,575.00
MARKUP % =	\$	0.15
MARKUP =	\$	5,786.25
SUB-TOTAL w/ OH & P =	\$	44,361.25
CONTINGENCY % =		0.25
CONTINGENCY =	\$	11,090.31
BUDGET COST ESTIMATE =	\$	55,451.56

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Water Department									
1	150 Ton, rotary Screw Chiller, Water cooled	1	ea.	\$ 69,000.00	\$ 69,000.00	1	ea.	\$24,500.00	\$24,500.00	\$ 93,500.00
2	Centrifugal Pump, 4 in, 5 HP	4	CLF	\$ 6,925.00	\$ 27,700.00	4	ea.	\$570.00	\$2,280.00	\$ 29,980.00
3	Steel Pipe, 4 in, welded	80	LF	\$ 15.95	\$ 1,276.00	80	ea.	\$23.50	\$1,880.00	\$ 3,156.00
4	Valves, 4in, shut off	4	ea.	\$ 233.00	\$ 932.00	4	ea.	\$169.00	\$676.00	\$ 1,608.00
5	Valves, 4 in, Triple duty	4	ea.	\$ 1,025.00	\$ 4,100.00	4	ea.	\$281.00	\$1,124.00	\$ 5,224.00
5	Pipe Insulation, 2 in wall, 4 in pipe	80	ea.	\$ 7.80	\$ 624.00	80	ea.	\$11.40	\$912.00	\$ 1,536.00
	Subtotal				103,632.00				31,372.00	

*Pricing per RS Means COSTWORKS

**Includes installation cost per RS Means COSTWORKS.

Includes estimated chiller demolition

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

SUBTOTAL = \$ 135,004.00
 MARKUP % = \$ 0.15
 MARKUP = \$ 20,250.60
 SUB-TOTAL w/ OH & P = \$ 155,254.60
 CONTINGENCY % = 0.25
 CONTINGENCY = \$ 38,813.65
 BUDGET COST ESTIMATE = \$ 194,068.25

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Water Department									
1	Condensing Boiler, 2,000 MBH, Oil Fired	1	ea.	\$ 52,000.00	\$ 52,000.00	1	ea.	\$7,575.00	\$7,575.00	\$ 59,575.00
2	Boiler and Piping Demolition	1	ea.	\$ -	\$ -	1	ea.	\$2,626.00	\$2,626.00	\$ 2,626.00
3	Centrifugal Pump, 4 in, 5 HP	1	CLF	\$ 6,175.00	\$ 6,175.00	1	ea.	\$535.00	\$535.00	\$ 6,710.00
4	Steel Pipe, 4 in, welded	40	LF	\$ 52.00	\$ 2,080.00	40	ea.	\$24.00	\$960.00	\$ 3,040.00
5	Valves, 4in, shut off	1	ea.	\$ 865.00	\$ 865.00	1	ea.	\$282.00	\$282.00	\$ 1,147.00
6	Valves, 4 in, Triple duty	1	ea.	\$ 1,025.00	\$ 1,025.00	1	ea.	\$281.00	\$281.00	\$ 1,306.00
7	Pipe Insulation, 2 in wall, 4 in pipe	40	ea.	\$ 2.27	\$ 90.80	40	ea.	\$4.93	\$197.20	\$ 288.00
	Subtotal				62,235.80				12,456.20	

*Pricing per RS Means COSTWORKS

**Includes installation cost per RS Means COSTWORKS.

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

SUBTOTAL = \$ 74,692.00
 MARKUP % = \$ 0.15
 MARKUP = \$ 11,203.80
 SUB-TOTAL w/ OH & P = \$ 85,895.80
 CONTINGENCY % = 0.25
 CONTINGENCY = \$ 21,473.95
 BUDGET COST ESTIMATE = \$ 107,369.75

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Police Court									
1	Air Handler, 1500 CFM, Heating and Cooling	1	ea.	\$ 3,225.00	\$ 3,225.00	1	ea.	\$725.00	\$725.00	\$ 3,950.00
2	Copper Pipe, 1"	120	LF	\$ 7.95	\$ 954.00	120	LF	\$7.15	\$858.00	\$ 1,812.00
3	Galvanized Duct,	100	LB	\$ 0.46	\$ 46.00	100	LB	\$5.20	\$520.00	\$ 566.00
4	Pipe and Duct Insulation, 1-1/2" Thick, ASJ	200	SqFt	\$ 0.71	\$ 142.20	200	SqFt	\$4.57	\$913.20	\$ 1,055.40
5	Control valves, 1" 3-way	2	ea.	\$ 315.00	\$ 630.00	2	ea.	\$25.00	\$50.00	\$ 680.00
6	Control points and sensors	6	ea.	\$ 200.00	\$ 1,200.00	6	ea.	\$200.00	\$1,200.00	\$ 2,400.00
	Subtotal				6,197.20				4,266.20	

*Pricing per RS Means COSTWORKS.

SUBTOTAL = \$ 10,463.40

MARKUP % = \$ 0.15

MARKUP = \$ 1,569.51

SUB-TOTAL w/ OH & P = \$ 12,032.91

CONTINGENCY % = 0.25

CONTINGENCY = \$ 3,008.23

BUDGET COST ESTIMATE = \$ 15,041.14

**Includes installation cost per RS Means COSTWORKS.

Estimate does not include design, additional valves, pumps and dampers.

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	Bristol Recreation Building Unit Heater, Gas-Fired, Condensing High Efficiency, 100 MBH	2	ea.	\$ 2,400.00	\$ 4,800.00	2	ea.	\$ 528.00	\$ 1,056.00	\$ 5,856.00
	Subtotal				4,800.00				1,056.00	

*Pricing per vendor

**Includes installation of new heaters and associated venting.

Does not include disposal of current, equipment modification of gas piping, electrical, or modifying ductwork

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

SUBTOTAL =	\$	5,856.00
MARKUP % =	\$	0.15
MARKUP =	\$	878.40
SUB-TOTAL w/ OH & P =	\$	6,734.40
CONTINGENCY % =		0.25
CONTINGENCY =	\$	1,683.60
BUDGET COST ESTIMATE =	\$	8,418.00

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Bristol Fire House									
1	250 kW Diesel Generator w/ Transfer switch, muffler, battery and charger	1	ea.	\$ 56,500.00	\$ 56,500.00	1	ea.	\$5,225.00	\$5,225.00	\$ 61,725.00
2	Wire, 350 Kcmil, in conduit	16	CLF	\$ 680.00	\$ 10,880.00	16	CLF	\$238.00	\$3,808.00	\$ 14,688.00
3	Conduit, 4" EMT, inc elbows, terminations	200	LF	\$ 18.25	\$ 3,650.00	200	LF	\$10.70	\$2,140.00	\$ 5,790.00
4	Equipment Pad, 10x10, 36in thick	12	cu. YD	\$ 700.00	\$ 8,400.00	12	cu. YD	\$465.00	\$5,580.00	\$ 13,980.00
5	Oil Tank, Double wall, 4000 gallons	1	ea.	\$ 14,700.00	\$ 14,700.00	1	ea.	\$495.00	\$495.00	\$ 15,195.00
	Subtotal				94,130.00				17,248.00	

*Pricing per RS Means COSTWORKS

SUBTOTAL = \$ 111,378.00

MARKUP % = \$ 0.15

MARKUP = \$ 16,706.70

SUB-TOTAL w/ OH & P = \$ 128,084.70

CONTINGENCY % = 0.25

CONTINGENCY = \$ 32,021.18

BUDGET COST ESTIMATE = \$ 160,105.88

**Includes installation cost per RS Means COSTWORKS.

Estimate does not include permitting or design.

CLF = 100 Linear Feet

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Bristol Fire Houses									
1	Boiler Controller - Heat-Timer Plat HWR-Q with BACnet Interface	5	ea.	\$ 6,668.00	\$ 33,340.00	5	ea.	\$ 950.00	\$ 4,750.00	\$ 38,090.00
2	Johnson Controls, DDC controller, web based	5	ea.	\$ 4,200.00	\$ 21,000.00	5	ea.	\$ 1,200.00	\$ 6,000.00	\$ 27,000.00
	Subtotal				54,340.00				10,750.00	

*Pricing per vendor

**Includes installation of Heat Timer, Boiler relays and sensors, space temp sensor, outdoor temp sensor, and 120V power.

Estimate does not include providing internet connection for the individual buildings or connecting the DDC to cooling system.

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

SUBTOTAL = \$ 65,090.00
MARKUP % = \$ 0.15
MARKUP = \$ 9,763.50
SUB-TOTAL w/ OH & P = \$ 74,853.50
CONTINGENCY % = 0.25
CONTINGENCY = \$ 18,713.38
BUDGET COST ESTIMATE = \$ 93,566.88

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: MJR
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	Fire HQ, 2, 4, & 5 2" Thick Pipe Insulation, 850F Mineral Fiber for 3" Pipe with All Service Jacket	1	ea.	\$ 327.00	\$ 327.00	1	ea.	\$ 328.00	\$ 328.00	\$ 655.00
	Subtotal				327.00				328.00	

*Pricing per CostWorks 2010

SUBTOTAL = \$ 655.00
MARKUP % = \$ 0.15
MARKUP = \$ 98.25
SUB-TOTAL w/ OH & P = \$ 753.25
CONTINGENCY % = 0.25
CONTINGENCY = \$ 188.31
BUDGET COST ESTIMATE = \$ 941.56

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
2	City Hall Make-Up Water Piping 2" Thick Pipe Insulation, 850F Mineral Fiber for 2" Pipe with All Service Jacket	1	ea.	\$ 72.00	\$ 72.00	1	ea.	\$ 73.00	\$ 73.00	\$ 145.00
	Subtotal				72.00				73.00	

*Pricing per CostWorks 2010

SUBTOTAL = \$ 145.00
MARKUP % = \$ 0.15
MARKUP = \$ 21.75
SUB-TOTAL w/ OH & P = \$ 166.75
CONTINGENCY % = 0.25
CONTINGENCY = \$ 41.69
BUDGET COST ESTIMATE = \$ 208.44

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate
3. This estimate does not consider escalation of costs over time

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Fire House #3									
1	Condensing Boiler, 750 MBH, Gas Fired	1	ea.	\$ 20,000.00	\$ 20,000.00	1	ea.	\$4,075.00	\$4,075.00	\$ 24,075.00
2	Boiler and Piping Demolition	1	ea.	\$ -	\$ -	1	ea.	\$2,350.00	\$2,350.00	\$ 2,350.00
3	Centrifugal Pump, 3 in, 5 HP	1	ea.	\$ 2,225.00	\$ 2,225.00	1	ea.	\$370.00	\$370.00	\$ 2,595.00
4	Copper Pipe, 2-1/2in, Solder joints	40	LF	\$ 30.50	\$ 1,220.00	40	LF	\$14.20	\$568.00	\$ 1,788.00
5	Valves, 2-1/2 in, shut off	1	ea.	\$ 220.00	\$ 220.00	1	ea.	\$52.50	\$52.50	\$ 272.50
6	Valves, 2-1/2 in, Triple duty	1	ea.	\$ 440.00	\$ 440.00	1	ea.	\$168.00	\$168.00	\$ 608.00
7	Pipe Insulation, 1 in wall, 2-1/2 in pipe	40	LF	\$ 1.41	\$ 56.40	40	LF	\$3.70	\$148.00	\$ 204.40
	Subtotal				24,161.40				7,731.50	

*Pricing per RS Means COSTWORKS and Boiler Vender

**Includes installation cost per RS Means COSTWORKS.

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

SUBTOTAL = \$ 31,892.90
 MARKUP % = \$ 0.15
 MARKUP = \$ 4,783.94
 SUB-TOTAL w/ OH & P = \$ 36,676.84
 CONTINGENCY % = 0.25
 CONTINGENCY = \$ 9,169.21
 BUDGET COST ESTIMATE = \$ 45,846.04

CDM

11 British American Blvd
Latham, NY 12110
Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Fire Headquarters									
1	Condensing Boiler, 2,000 MBH, Oil Fired	1	ea.	\$ 52,000.00	\$ 52,000.00	1	ea.	\$7,575.00	\$7,575.00	\$ 59,575.00
2	Boiler and Piping Demolition	1	ea.	\$ -	\$ -	1	ea.	\$2,626.00	\$2,626.00	\$ 2,626.00
3	Centrifugal Pump, 4 in, 5 HP	1	ea.	\$ 6,175.00	\$ 6,175.00	1	ea.	\$535.00	\$535.00	\$ 6,710.00
4	Steel Pipe, 4 in, welded	40	LF	\$ 52.00	\$ 2,080.00	40	LF	\$24.00	\$960.00	\$ 3,040.00
5	Valves, 4in, shut off	1	ea.	\$ 865.00	\$ 865.00	1	ea.	\$282.00	\$282.00	\$ 1,147.00
6	Valves, 4 in, Triple duty	1	ea.	\$ 1,025.00	\$ 1,025.00	1	ea.	\$281.00	\$281.00	\$ 1,306.00
7	Pipe Insulation, 2 in wall, 4 in pipe	40	LF	\$ 2.27	\$ 90.80	40	LF	\$4.93	\$197.20	\$ 288.00
	Subtotal				62,235.80				12,456.20	

*Pricing per RS Means COSTWORKS

**Includes installation cost per RS Means COSTWORKS.

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

SUBTOTAL = \$ 74,692.00
 MARKUP % = \$ 0.15
 MARKUP = \$ 11,203.80
 SUB-TOTAL w/ OH & P = \$ 85,895.80
 CONTINGENCY % = 0.25
 CONTINGENCY = \$ 21,473.95
 BUDGET COST ESTIMATE = \$ 107,369.75

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Senior Center									
1	DDC point, Sensor, Temp and status	52	ea.	\$ 225.00	\$ 11,700.00	52	ea.	\$275.00	\$14,300.00	\$ 26,000.00
2	DDC Point, Calibration, Start-up and Check-out	52	ea.	\$ -	\$ -	52	ea.	\$190.00	\$9,880.00	\$ 9,880.00
3	Headend, Central controller	1	ea.	\$ 3,200.00	\$ 3,200.00	1	ea.	\$2,775.00	\$2,775.00	\$ 5,975.00
4	Digital Communication Trunk	600	LF	\$ 1.00	\$ 600.00	600	LF	\$2.50	\$1,500.00	\$ 2,100.00
5	Software and Programming	8	ea.	\$ -	\$ -	8	ea.	\$440.00	\$3,520.00	\$ 3,520.00
	Subtotal				15,500.00				31,975.00	

*Pricing per RS Means COSTWORKS and Boiler Vender

SUBTOTAL = \$ 47,475.00

MARKUP % = \$ 0.15

MARKUP = \$ 7,121.25

SUB-TOTAL w/ OH & P = \$ 54,596.25

CONTINGENCY % = 0.25

CONTINGENCY = \$ 13,649.06

BUDGET COST ESTIMATE = \$ 68,245.31

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Senior Center									
1	Condensing Boiler, 3,000 MBH, Gas Fired	1	ea.	\$ 72,000.00	\$ 72,000.00	1	ea.	\$10,000.00	\$10,000.00	\$ 82,000.00
2	Boiler and Piping Demolition	1	ea.	\$ -	\$ -	1	ea.	\$4,140.00	\$4,140.00	\$ 4,140.00
3	Centrifugal Pump, 4 in, 5 HP	1	ea.	\$ 6,925.00	\$ 2,150.00	1	ea.	\$570.00	\$570.00	\$ 2,720.00
4	Steel Pipe, 6 in, Welded and Flanged	60	LF	\$ 26.50	\$ 668.00	60	LF	\$37.00	\$2,220.00	\$ 2,888.00
5	Valves, 6 in, shut off	1	ea.	\$ 1,475.00	\$ 65.50	1	ea.	\$440.00	\$440.00	\$ 505.50
6	Valves, 6 in, Triple duty	1	ea.	\$ 1,500.00	\$ 408.00	1	ea.	\$435.00	\$435.00	\$ 843.00
7	Pipe Insulation, 1-1/2 in wall, 6 in pipe	60	LF	\$ 3.68	\$ 52.40	60	LF	\$6.70	\$402.00	\$ 454.40
	Subtotal				75,343.90				18,207.00	

*Pricing per RS Means COSTWORKS and Boiler Vender

**Includes installation cost per RS Means COSTWORKS.

Notes:

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3. This estimate does not consider escalation of costs over time

SUBTOTAL = \$ 93,550.90
 MARKUP % = \$ 0.15
 MARKUP = \$ 14,032.64
 SUB-TOTAL w/ OH & P = \$ 107,583.54
 CONTINGENCY % = 0.25
 CONTINGENCY = \$ 26,895.88
 BUDGET COST ESTIMATE = \$ 134,479.42

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Public Library									
1	30 Ton, Scroll Chiller, Air cooled	1	ea.	\$ 26,300.00	\$ 26,300.00	1	ea.	\$5,025.00	\$5,025.00	\$ 31,325.00
2	Centrifugal Pump, 4 in, 5 HP	4	CLF	\$ 864.80	\$ 3,459.20	4	CLF	\$570.00	\$2,280.00	\$ 5,739.20
3	Steel Pipe, 4 in, welded	80	LF	\$ 15.95	\$ 1,276.00	80	LF	\$23.50	\$1,880.00	\$ 3,156.00
4	Valves, 4in, shut off	4	ea.	\$ 233.00	\$ 932.00	4	ea.	\$169.00	\$676.00	\$ 1,608.00
5	Valves, 4 in, Triple duty	4	ea.	\$ 1,025.00	\$ 4,100.00	4	ea.	\$281.00	\$1,124.00	\$ 5,224.00
5	Pipe Insulation, 2 in wall, 4 in pipe	80	LF	\$ 7.80	\$ 624.00	80	LF	\$11.40	\$912.00	\$ 1,536.00
	Subtotal				36,691.20				11,897.00	

*Pricing per RS Means COSTWORKS & Manufacturers Website

**Includes installation cost per RS Means COSTWORKS.

Includes estimated chiller demolition

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

SUBTOTAL = \$ 48,588.20
 MARKUP % = \$ 0.15
 MARKUP = \$ 7,288.23
 SUB-TOTAL w/ OH & P = \$ 55,876.43
 CONTINGENCY % = 0.25
 CONTINGENCY = \$ 13,969.11
 BUDGET COST ESTIMATE = \$ 69,845.54

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Make up Air Preheat Unit									
	DPW									
1	Makeup air unit with Water Coil	1	ea.	\$ 8,000.00	\$ 8,000.00	1	ea.	\$1,700.00	\$1,700.00	\$ 9,700.00
2	Pipe, 2-1/2 in	125	LF	\$ 20.00	\$ 2,500.00	125	ea.	\$24.00	\$3,000.00	\$ 5,500.00
3	Demolition, HVAC RTU	1	ea.	\$ -	\$ -	1	ea.	\$586.00	\$586.00	\$ 586.00
4	Wire in conduit, #4 copper x 4	100	ea.	\$ 8.00	\$ 800.00	100	ea.	\$8.60	\$860.00	\$ 1,660.00
	Subtotal				11,300.00				6,146.00	

*Pricing per RS Means COSTWORKS and Vendor Quotes

Material does not include design, heating system, controls, and ductwork modification in the building.

**Includes installation cost per RS Means COSTWORKS.

Installation does not include design, heating system, controls, and ductwork modification in the building.

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3. This estimate does not consider escalation of costs over time

SUBTOTAL = \$ 17,446.00

MARKUP % = \$ 0.15

MARKUP = \$ 2,616.90

SUB-TOTAL w/ OH & P = \$ 20,062.90

CONTINGENCY % = 0.25

CONTINGENCY = \$ 5,015.73

BUDGET COST ESTIMATE = \$ 25,078.63

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Water Source Heat Pump Make up Air unit									
	DPW									
1	100 MBH Water to Water Heat Pump	2	ea.	\$ 8,575.00	\$ 17,150.00	2	ea.	\$1,700.00	\$3,400.00	\$ 20,550.00
2	Hot Water RTU,	2	ea.	\$ 24,500.00	\$ 49,000.00	2	ea.	\$1,750.00	\$3,500.00	\$ 52,500.00
3	Pump, 2-1/2 in bronze impeller	2	ea.	\$ 2,500.00	\$ 5,000.00	2	ea.	\$440.00	\$880.00	\$ 5,880.00
4	Pipe, 2-1/2 in	250	LF	\$ 20.00	\$ 5,000.00	250	ea.	\$24.00	\$6,000.00	\$ 11,000.00
5	Demolition, HVAC RTU	2	ea.	\$ -	\$ -	2	ea.	\$586.00	\$1,172.00	\$ 1,172.00
6	Weather proof enclosure	1	ea.	\$ 4,000.00	\$ 4,000.00	1	ea.	\$1,200.00	\$1,200.00	\$ 5,200.00
7	Storage Tank, 400 gallons	1	ea.	\$ 2,100.00	\$ 2,100.00	1	ea.	\$950.00	\$950.00	\$ 3,050.00
8	Wire in conduit, #4 copper x 4	200	ea.	\$ 8.00	\$ 1,600.00	200	ea.	\$8.60	\$1,720.00	\$ 3,320.00
	Subtotal				83,850.00				18,822.00	

SUBTOTAL = \$ 102,672.00

MARKUP % = \$ 0.15

MARKUP = \$ 15,400.80

SUB-TOTAL w/ OH & P = \$ 118,072.80

CONTINGENCY % = 0.25

CONTINGENCY = \$ 29,518.20

BUDGET COST ESTIMATE = \$ 147,591.00

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Standard Gas Fired Make up Air Unit									
	DPW									
1	100 MBH Gas fired Make Up Air Unit	2	ea.	\$ 11,400.00	\$ 22,800.00	2	ea.	\$1,100.00	\$2,200.00	\$ 25,000.00
2	Gas Pipe, 1 in	10	LF	\$ 20.00	\$ 200.00	10	ea.	\$24.00	\$240.00	\$ 440.00
3	Demolition, HVAC RTU	2	ea.	\$ -	\$ -	2	ea.	\$586.00	\$1,172.00	\$ 1,172.00
	Subtotal				23,000.00				3,612.00	

*Pricing per RS Means COSTWORKS

SUBTOTAL = \$ 26,612.00

MARKUP % = \$ 0.15

MARKUP = \$ 3,991.80

SUB-TOTAL w/ OH & P = \$ 30,603.80

CONTINGENCY % = 0.25

CONTINGENCY = \$ 7,650.95

BUDGET COST ESTIMATE = \$ 38,254.75

INCREMENTAL COST ESTIMATE = \$ 109,336.25

**Includes installation cost per RS Means COSTWORKS.

Installation does not include design

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

CDM

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Manross Public Library									
1	Condensing Boiler, 450 MBH, Gas Fired	1	ea.	\$ 16,000.00	\$ 16,000.00	1	ea.	\$3,225.00	\$3,225.00	\$ 19,225.00
2	Boiler and Piping Demolition	1	ea.	\$ -	\$ -	1	ea.	\$2,350.00	\$2,350.00	\$ 2,350.00
3	Centrifugal Pump, 2 in, 2 HP	1	ea.	\$ 2,225.00	\$ 2,150.00	1	ea.	\$284.00	\$284.00	\$ 2,434.00
4	Copper Pipe, 2 in, Solder joints	40	LF	\$ 30.50	\$ 668.00	40	LF	\$450.00	\$18,000.00	\$ 18,668.00
5	Valves, 2 in, shut off	1	ea.	\$ 220.00	\$ 65.50	1	ea.	\$43.00	\$43.00	\$ 108.50
6	Valves, 2 in, Triple duty	1	ea.	\$ 405.00	\$ 408.00	1	ea.	\$59.00	\$59.00	\$ 467.00
7	Pipe Insulation, 1 in wall, 2 in pipe	40	LF	\$ 1.41	\$ 52.40	40	LF	\$140.80	\$5,632.00	\$ 5,684.40
	Subtotal				19,343.90				29,593.00	

*Pricing per RS Means COSTWORKS and Boiler Vender

**Includes installation cost per RS Means COSTWORKS.

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

SUBTOTAL = \$ 48,936.90
 MARKUP % = \$ 0.15
 MARKUP = \$ 7,340.54
 SUB-TOTAL w/ OH & P = \$ 56,277.44
 CONTINGENCY % = 0.25
 CONTINGENCY = \$ 14,069.36
 BUDGET COST ESTIMATE = \$ 70,346.79

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: BRM
Checked by: MG

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
	Bristol Youth Services									
1	Boiler Controller - Heat-Timer Plat HWR-Q with BACnet Interface	1	ea.	\$ 6,668.00	\$ 6,668.00	1	ea.	\$ 950.00	\$ 950.00	\$ 7,618.00
2	Johnson Controls, DDC controller, web based	1	ea.	\$ 4,200.00	\$ 4,200.00	1	ea.	\$ 1,200.00	\$ 1,200.00	\$ 5,400.00
	Subtotal				10,868.00				2,150.00	

*Pricing per vendor

**Includes installation of Heat Timer, Boiler relays and sensors, space temp sensor, outdoor temp sensor, and 120V power.

Estimate does not include building internet connection or connecting to the individual air handlers.

Notes:

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3. This estimate does not consider escalation of costs over time

SUBTOTAL = \$ 13,018.00
 MARKUP % = \$ 0.15
 MARKUP = \$ 1,952.70
 SUB-TOTAL w/ OH & P = \$ 14,970.70
 CONTINGENCY % = 0.25
 CONTINGENCY = \$ 3,742.68
 BUDGET COST ESTIMATE = \$ 18,713.38

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: RAD
Checked by: TK

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	City Hall Window Replacement	8,100	sq. ft.	\$ 40.00	\$ 324,000.00	8,100	sq. ft.	\$ 20.00	\$ 162,000.00	\$ 486,000.00
	Subtotal				324,000.00				162,000.00	

SUBTOTAL = \$ 486,000.00
 MARKUP % = \$ 0.15
 MARKUP = \$ 72,900.00
 SUB-TOTAL w/ OH & P = \$ 558,900.00
 CONTINGENCY % = 0.25
 CONTINGENCY = \$ 139,725.00
 BUDGET COST ESTIMATE = \$ 698,625.00

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: RAD
Checked by: TK

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	City Hall Window Replacement with Insulated Spandrel Panel	8,100	sq. ft.	\$ 20.00	\$ 162,000.00	8,100	sq. ft.	\$ 15.00	\$ 121,500.00	\$ 283,500.00
	Subtotal				162,000.00				121,500.00	

SUBTOTAL = \$ 283,500.00

MARKUP % = \$ 0.15

MARKUP = \$ 42,525.00

SUB-TOTAL w/ OH & P = \$ 326,025.00

CONTINGENCY % = 0.25

CONTINGENCY = \$ 81,506.25

BUDGET COST ESTIMATE = \$ 407,531.25

Notes:

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2. Since some of the work will occur in older buildings, there is the potential to encounter asbestos or other materials requiring special removal and handling. Currently available information is not adequate to determine if such conditions exist, consequently these costs are not included in this estimate.
3. This estimate does not consider escalation of costs over time

CDM

11 British American Blvd
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Phone (518) 782-4500
Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: RAD
Checked by: TK

ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	Police Court Window Replacement	1,500	sq. ft.	\$ 40.00	\$ 60,000.00	1,500	sq. ft.	\$ 20.00	\$ 30,000.00	\$ 90,000.00
	Subtotal				60,000.00				30,000.00	

SUBTOTAL = \$ 90,000.00
 MARKUP % = \$ 0.15
 MARKUP = \$ 13,500.00
 SUB-TOTAL w/ OH & P = \$ 103,500.00
 CONTINGENCY % = 0.25
 CONTINGENCY = \$ 25,875.00
 BUDGET COST ESTIMATE = \$ 129,375.00

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: RAD
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ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	Fire Headquarters Window Replacement	1,200	sq. ft.	\$ 40.00	\$ 48,000.00	1,200	sq. ft.	\$ 20.00	\$ 24,000.00	\$ 72,000.00
	Subtotal				48,000.00				24,000.00	

SUBTOTAL =	\$	72,000.00
MARKUP % =	\$	0.15
MARKUP =	\$	10,800.00
SUB-TOTAL w/ OH & P =	\$	82,800.00
CONTINGENCY % =		0.25
CONTINGENCY =	\$	20,700.00
BUDGET COST ESTIMATE =	\$	103,500.00

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: RAD
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ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	Fire Engine Company No.2 Window Replacement	270	sq. ft.	\$ 40.00	\$ 10,800.00	270	sq. ft.	\$ 20.00	\$ 5,400.00	\$ 16,200.00
	Subtotal				10,800.00				5,400.00	

SUBTOTAL =	\$	16,200.00
MARKUP % =	\$	0.15
MARKUP =	\$	2,430.00
SUB-TOTAL w/ OH & P =	\$	18,630.00
CONTINGENCY % =		0.25
CONTINGENCY =	\$	4,657.50
BUDGET COST ESTIMATE =	\$	23,287.50

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: RAD
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ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	Fire Engine Company No.3 thru 5 Window Replacement	230	sq. ft.	\$ 40.00	\$ 9,200.00	230	sq. ft.	\$ 20.00	\$ 4,600.00	\$ 13,800.00
	Subtotal				9,200.00				4,600.00	

*For each fire company.

SUBTOTAL =	\$	13,800.00
MARKUP % =	\$	0.15
MARKUP =	\$	2,070.00
SUB-TOTAL w/ OH & P =	\$	15,870.00
CONTINGENCY % =		0.25
CONTINGENCY =	\$	3,967.50
BUDGET COST ESTIMATE =	\$	19,837.50

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: RAD
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ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	Mancross Public Library									
	Wall Improvements	2,800	sq. ft.	\$ 15.00	\$ 42,000.00	2,800	sq. ft.	\$ 5.00	\$ 14,000.00	\$ 56,000.00
2	Roof Replacement	6,600	sq. ft.	\$ 18.00	\$ 118,800.00	6,600	sq. ft.	\$ 7.00	\$ 46,200.00	\$ 165,000.00
	Subtotal				42,000.00				14,000.00	

SUBTOTAL = \$ 221,000.00

MARKUP % = \$ 0.15

MARKUP = \$ 33,150.00

SUB-TOTAL w/ OH & P = \$ 254,150.00

CONTINGENCY % = 0.25

CONTINGENCY = \$ 63,537.50

BUDGET COST ESTIMATE = \$ 317,687.50

Notes:

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: RAD
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ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	Young Services Main Building Batt Insulation Installation	2,800	sq. ft.	\$ 1.00	\$ 2,800.00	2,800	sq. ft.	\$ 1.00	\$ 2,800.00	\$ 5,600.00
	Subtotal				2,800.00				2,800.00	

SUBTOTAL =	\$	5,600.00
MARKUP % =	\$	0.15
MARKUP =	\$	840.00
SUB-TOTAL w/ OH & P =	\$	6,440.00
CONTINGENCY % =		0.25
CONTINGENCY =	\$	1,610.00
BUDGET COST ESTIMATE =	\$	8,050.00

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: City of Bristol
Estimate by: RAD
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ITEM	DESCRIPTION	QTY	UNIT	*MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	**LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Admin Bldg Hollow Metal Door Replacement	1	NA	\$ 800.00	\$ 800.00	1	NA	\$ 400.00	\$ 400.00	\$ 1,200.00
	Subtotal				800.00				400.00	

SUBTOTAL =	\$	1,200.00
MARKUP % =	\$	0.15
MARKUP =	\$	180.00
SUB-TOTAL w/ OH & P =	\$	1,380.00
CONTINGENCY % =		0.25
CONTINGENCY =	\$	345.00
BUDGET COST ESTIMATE =	\$	1,725.00

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	City Hall Lighting Upgrades	1	ea.	\$ 4,366.00	\$ 4,366.00	1	ea.	\$ 3,234.50	\$ 3,234.50	\$ 7,600.50
	Subtotal				\$ 4,366.00				\$ 3,234.50	

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL = \$ 7,600.50
MARKUP % = \$ 0.15
MARKUP = \$ 1,140.08
SUB-TOTAL w/ OH & P = \$ 8,740.58
CONTINGENCY % = 0.25
CONTINGENCY = \$ 2,185.14
BUDGET COST ESTIMATE = \$ 10,925.72

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	City Hall Annex Lighting Upgrades	1	ea.	\$ 392.00	\$ 392.00	1	ea.	\$ 448.50	\$ 448.50	\$ 840.50
	Subtotal				\$ 392.00				\$ 448.50	

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SUBTOTAL = \$ 840.50
MARKUP % = \$ 0.15
MARKUP = \$ 126.08
SUB-TOTAL w/ OH & P = \$ 966.58
CONTINGENCY % = 0.25
CONTINGENCY = \$ 241.64
BUDGET COST ESTIMATE = \$ 1,208.22

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Department - Main Office									
	Lighting Upgrades	1	ea.	\$ 4,294.50	\$ 4,294.50	1	ea.	\$ 2,161.50	\$ 2,161.50	\$ 6,456.00
	Subtotal				\$ 4,294.50				\$ 2,161.50	

SUBTOTAL = \$ 6,456.00

MARKUP % = \$ 0.15

MARKUP = \$ 968.40

SUB-TOTAL w/ OH & P = \$ 7,424.40

CONTINGENCY % = 0.25

CONTINGENCY = \$ 1,856.10

BUDGET COST ESTIMATE = \$ 9,280.50

Notes:

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Department - Garage									
	Lighting Upgrades	1	ea.	\$ 3,280.00	\$ 3,280.00	1	ea.	\$ 1,291.00	\$ 1,291.00	\$ 4,571.00
	Subtotal				\$ 3,280.00				\$ 1,291.00	

SUBTOTAL = \$ 4,571.00

MARKUP % = \$ 0.15

MARKUP = \$ 685.65

SUB-TOTAL w/ OH & P = \$ 5,256.65

CONTINGENCY % = 0.25

CONTINGENCY = \$ 1,314.16

BUDGET COST ESTIMATE = \$ 6,570.81

Notes:

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4. Escalation not included in estimate.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Department - Water Filtration Plant									
	Lighting Upgrades	1	ea.	\$ 8,016.00	\$ 8,016.00	1	ea.	\$ 2,649.50	\$ 2,649.50	\$ 10,665.50
	Subtotal				\$ 8,016.00				\$ 2,649.50	

SUBTOTAL = \$ 10,665.50

MARKUP % = \$ 0.15

MARKUP = \$ 1,599.83

SUB-TOTAL w/ OH & P = \$ 12,265.33

CONTINGENCY % = 0.25

CONTINGENCY = \$ 3,066.33

BUDGET COST ESTIMATE = \$ 15,331.66

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Department - High Service Pump Station									
	Lighting Upgrades	1	ea.	\$ 780.00	\$ 780.00	1	ea.	\$ 354.00	\$ 354.00	\$ 1,134.00
	Subtotal				\$ 780.00				\$ 354.00	

SUBTOTAL = \$ 1,134.00

MARKUP % = \$ 0.15

MARKUP = \$ 170.10

SUB-TOTAL w/ OH & P = \$ 1,304.10

CONTINGENCY % = 0.25

CONTINGENCY = \$ 326.03

BUDGET COST ESTIMATE = \$ 1,630.13

Notes:

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4. Escalation not included in estimate.

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Department - #1 Well House									
	Lighting Upgrades	1	ea.	\$ 775.20	\$ 775.20	1	ea.	\$ 543.00	\$ 543.00	\$ 1,318.20
	Subtotal				\$ 775.20				\$ 543.00	

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL = \$ 1,318.20
MARKUP % = \$ 0.15
MARKUP = \$ 197.73
SUB-TOTAL w/ OH & P = \$ 1,515.93
CONTINGENCY % = 0.25
CONTINGENCY = \$ 378.98
BUDGET COST ESTIMATE = \$ 1,894.91

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Department - #2 Well House									
	Lighting Upgrades	1	ea.	\$ 380.00	\$ 380.00	1	ea.	\$ 137.00	\$ 137.00	\$ 517.00
	Subtotal				\$ 380.00				\$ 137.00	

Notes:

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SUBTOTAL = \$ 517.00
MARKUP % = \$ 0.15
MARKUP = \$ 77.55
SUB-TOTAL w/ OH & P = \$ 594.55
CONTINGENCY % = 0.25
CONTINGENCY = \$ 148.64
BUDGET COST ESTIMATE = \$ 743.19

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Department - #3 Well House									
	Lighting Upgrades	1	ea.	\$ 10.00	\$ 10.00	1	ea.	\$ 40.00	\$ 40.00	\$ 50.00
	Subtotal				\$ 10.00				\$ 40.00	

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4. Escalation not included in estimate.

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SUBTOTAL = \$ 50.00
MARKUP % = \$ 0.15
MARKUP = \$ 7.50
SUB-TOTAL w/ OH & P = \$ 57.50
CONTINGENCY % = 0.25
CONTINGENCY = \$ 14.38
BUDGET COST ESTIMATE = \$ 71.88

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Department - #4 Well House									
	Lighting Upgrades	1	ea.	\$ 10.00	\$ 10.00	1	ea.	\$ 40.00	\$ 40.00	\$ 50.00
	Subtotal				\$ 10.00				\$ 40.00	

Notes:

1. CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
2. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL = \$ 50.00
MARKUP % = \$ 0.15
MARKUP = \$ 7.50
SUB-TOTAL w/ OH & P = \$ 57.50
CONTINGENCY % = 0.25
CONTINGENCY = \$ 14.38
BUDGET COST ESTIMATE = \$ 71.88

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Department - #5 Well House									
	Lighting Upgrades	1	ea.	\$ 390.00	\$ 390.00	1	ea.	\$ 177.00	\$ 177.00	\$ 567.00
	Subtotal				\$ 390.00				\$ 177.00	

Notes:

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 3. Bonds not included in estimate.
 4. Escalation not included in estimate.
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SUBTOTAL =	\$	567.00
MARKUP % =	\$	0.15
MARKUP =	\$	85.05
SUB-TOTAL w/ OH & P =	\$	652.05
CONTINGENCY % =		0.25
CONTINGENCY =	\$	163.01
BUDGET COST ESTIMATE =	\$	815.06

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Department - Chemical and Control									
	Lighting Upgrades	1	ea.	\$ 460.00	\$ 460.00	1	ea.	\$ 202.00	\$ 202.00	\$ 662.00
	Subtotal				\$ 460.00				\$ 202.00	

Notes:

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 3. Bonds not included in estimate.
 4. Escalation not included in estimate.
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SUBTOTAL =	\$	662.00
MARKUP % =	\$	0.15
MARKUP =	\$	99.30
SUB-TOTAL w/ OH & P =	\$	761.30
CONTINGENCY % =		0.25
CONTINGENCY =	\$	190.33
BUDGET COST ESTIMATE =	\$	951.63

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Department - Generator									
	Lighting Upgrades	1	ea.	\$ 720.20	\$ 720.20	1	ea.	\$ 323.00	\$ 323.00	\$ 1,043.20
	Subtotal				\$ 720.20				\$ 323.00	

Notes:

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 - Bonds not included in estimate.
 - Escalation not included in estimate.
- o *This is an Opinion of Probable Construction Cost only. CDM has no control over the cost of labor, materials, equipment, or services furnished, over schedules, over contractor's methods of determining prices, competitive bidding, market conditions or negotiating terms. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids. There are not any costs provided for: Change Orders, Design Engineering, Construction Oversight, Client Costs, Finance or Funding Costs, Legal Fees, Land Acquisition or temporary/permanent Easements, Operations, or any other costs associated with this project that are not specifically part of the bidding contractor's proposed scope.

SUBTOTAL =	\$	1,043.20
MARKUP % =	\$	0.15
MARKUP =	\$	156.48
SUB-TOTAL w/ OH & P =	\$	1,199.68
CONTINGENCY % =		0.25
CONTINGENCY =	\$	299.92
BUDGET COST ESTIMATE =	\$	1,499.60

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Police Court									
	Lighting Upgrades	1	ea.	\$ 11,160.00	\$ 11,160.00	1	ea.	\$ 5,092.50	\$ 5,092.50	\$ 16,252.50
	Subtotal				\$ 11,160.00				\$ 5,092.50	

Notes:

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 - CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
 - Bonds not included in estimate.
 - Escalation not included in estimate.
- o *This is an Opinion of Probable Construction Cost only. CDM has no control over the cost of labor, materials, equipment, or services furnished, over schedules, over contractor's methods of determining prices, competitive bidding, market conditions or negotiating terms. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids. There are not any costs provided for: Change Orders, Design Engineering, Construction Oversight, Client Costs, Finance or Funding Costs, Legal Fees, Land Acquisition or temporary/permanent Easements, Operations, or any other costs associated with this project that are not specifically part of the bidding contractor's proposed scope.

SUBTOTAL =	\$	16,252.50
MARKUP % =	\$	0.15
MARKUP =	\$	2,437.88
SUB-TOTAL w/ OH & P =	\$	18,690.38
CONTINGENCY % =		0.25
CONTINGENCY =	\$	4,672.59
BUDGET COST ESTIMATE =	\$	23,362.97

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Parking Garage									
	Lighting Upgrades	1	ea.	\$ 6,860.00	\$ 6,860.00	1	ea.	\$ 1,370.00	\$ 1,370.00	\$ 8,230.00
	Subtotal				\$ 6,860.00				\$ 1,370.00	

Notes:

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 2. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
 3. Bonds not included in estimate.
 4. Escalation not included in estimate.
- o *This is an Opinion of Probable Construction Cost only. CDM has no control over the cost of labor, materials, equipment, or services furnished, over schedules, over contractor's methods of determining prices, competitive bidding, market conditions or negotiating terms. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids. There are not any costs provided for: Change Orders, Design Engineering, Construction Oversight, Client Costs, Finance or Funding Costs, Legal Fees, Land Acquisition or temporary/permanent Easements, Operations, or any other costs associated with this project that are not specifically part of the bidding contractor's proposed scope.

SUBTOTAL =	\$	8,230.00
MARKUP % =	\$	0.15
MARKUP =	\$	1,234.50
SUB-TOTAL w/ OH & P =	\$	9,464.50
CONTINGENCY % =		0.25
CONTINGENCY =	\$	2,366.13
BUDGET COST ESTIMATE =	\$	11,830.63

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Parks and Recreation - Rockwell Park									
	Lighting Upgrades	1	ea.	\$ 3,372.10	\$ 3,372.10	1	ea.	\$ 2,054.00	\$ 2,054.00	\$ 5,426.10
	Subtotal				\$ 3,372.10				\$ 2,054.00	

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL = \$ 5,426.10
MARKUP % = \$ 0.15
MARKUP = \$ 813.92
SUB-TOTAL w/ OH & P = \$ 6,240.02
CONTINGENCY % = 0.25
CONTINGENCY = \$ 1,560.00
BUDGET COST ESTIMATE = \$ 7,800.02

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Parks and Recreation - Rockwell Pavillion									
	Lighting Upgrades	1	ea.	\$ 493.00	\$ 493.00	1	ea.	\$ 250.50	\$ 250.50	\$ 743.50
	Subtotal				\$ 493.00				\$ 250.50	

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL = \$ 743.50
MARKUP % = \$ 0.15
MARKUP = \$ 111.53
SUB-TOTAL w/ OH & P = \$ 855.03
CONTINGENCY % = 0.25
CONTINGENCY = \$ 213.76
BUDGET COST ESTIMATE = \$ 1,068.78

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Parks and Recreation - Bathhouse									
	Lighting Upgrades	1	ea.	\$ 460.00	\$ 460.00	1	ea.	\$ 457.00	\$ 457.00	\$ 917.00
	Subtotal				\$ 460.00				\$ 457.00	

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL = \$ 917.00
MARKUP % = \$ 0.15
MARKUP = \$ 137.55
SUB-TOTAL w/ OH & P = \$ 1,054.55
CONTINGENCY % = 0.25
CONTINGENCY = \$ 263.64
BUDGET COST ESTIMATE = \$ 1,318.19

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Parks and Recreation - Muzzy Field									
	Lighting Upgrades	1	ea.	\$ 6,148.70	\$ 6,148.70	1	ea.	\$ 2,678.50	\$ 2,678.50	\$ 8,827.20
	Subtotal				\$ 6,148.70				\$ 2,678.50	

Notes:

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2. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL = \$ 8,827.20
MARKUP % = \$ 0.15
MARKUP = \$ 1,324.08
SUB-TOTAL w/ OH & P = \$ 10,151.28
CONTINGENCY % = 0.25
CONTINGENCY = \$ 2,537.82
BUDGET COST ESTIMATE = \$ 12,689.10

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Parks and Recreation - Ski Lodge									
	Lighting Upgrades	1	ea.	\$ 1,370.00	\$ 1,370.00	1	ea.	\$ 704.00	\$ 704.00	\$ 2,074.00
	Subtotal				\$ 1,370.00				\$ 704.00	

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL = \$ 2,074.00
MARKUP % = \$ 0.15
MARKUP = \$ 311.10
SUB-TOTAL w/ OH & P = \$ 2,385.10
CONTINGENCY % = 0.25
CONTINGENCY = \$ 596.28
BUDGET COST ESTIMATE = \$ 2,981.38

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Parks and Recreation - Page Park Pavillion									
	Lighting Upgrades	1	ea.	\$ 2,210.00	\$ 2,210.00	1	ea.	\$ 1,614.00	\$ 1,614.00	\$ 3,824.00
	Subtotal				\$ 2,210.00				\$ 1,614.00	

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL = \$ 3,824.00
MARKUP % = \$ 0.15
MARKUP = \$ 573.60
SUB-TOTAL w/ OH & P = \$ 4,397.60
CONTINGENCY % = 0.25
CONTINGENCY = \$ 1,099.40
BUDGET COST ESTIMATE = \$ 5,497.00

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Parks and Recreation - Recreation Building									
	Lighting Upgrades	1	ea.	\$ 424.00	\$ 424.00	1	ea.	\$ 297.00	\$ 297.00	\$ 721.00
	Subtotal				\$ 424.00				\$ 297.00	

Notes:

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 3. Bonds not included in estimate.
 4. Escalation not included in estimate.
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SUBTOTAL =	\$	721.00
MARKUP % =	\$	0.15
MARKUP =	\$	108.15
SUB-TOTAL w/ OH & P =	\$	829.15
CONTINGENCY % =		0.25
CONTINGENCY =	\$	207.29
BUDGET COST ESTIMATE =	\$	1,036.44

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Bristol Fire - Fire HQ									
	Lighting Upgrades	1	ea.	\$ 2,923.00	\$ 2,923.00	1	ea.	\$ 1,363.00	\$ 1,363.00	\$ 4,286.00
	Subtotal				\$ 2,923.00				\$ 1,363.00	

Notes:

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 2. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
 3. Bonds not included in estimate.
 4. Escalation not included in estimate.
- o "This is an Opinion of Probable Construction Cost only. CDM has no control over the cost of labor, materials, equipment, or services furnished, over schedules, over contractor's methods of determining prices, competitive bidding, market conditions or negotiating terms. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids. There are not any costs provided for: Change Orders, Design Engineering, Construction Oversight, Client Costs, Finance or Funding Costs, Legal Fees, Land Acquisition or temporary/permanent Easements, Operations, or any other costs associated with this project that are not specifically part of the bidding contractor's proposed scope.

SUBTOTAL =	\$	4,286.00
MARKUP % =	\$	0.15
MARKUP =	\$	642.90
SUB-TOTAL w/ OH & P =	\$	4,928.90
CONTINGENCY % =		0.25
CONTINGENCY =	\$	1,232.23
BUDGET COST ESTIMATE =	\$	6,161.13

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Bristol Fire - Engine 2									
	Lighting Upgrades	1	ea.	\$ 1,950.00	\$ 1,950.00	1	ea.	\$ 588.00	\$ 588.00	\$ 2,538.00
	Subtotal				\$ 1,950.00				\$ 588.00	

Notes:

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2. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL = \$ 2,538.00
MARKUP % = \$ 0.15
MARKUP = \$ 380.70
SUB-TOTAL w/ OH & P = \$ 2,918.70
CONTINGENCY % = 0.25
CONTINGENCY = \$ 729.68
BUDGET COST ESTIMATE = \$ 3,648.38

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Bristol Fire - Engine 3									
	Lighting Upgrades	1	ea.	\$ 2,759.00	\$ 2,759.00	1	ea.	\$ 1,005.50	\$ 1,005.50	\$ 3,764.50
	Subtotal				\$ 2,759.00				\$ 1,005.50	

Notes:

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2. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL = \$ 3,764.50
MARKUP % = \$ 0.15
MARKUP = \$ 564.68
SUB-TOTAL w/ OH & P = \$ 4,329.18
CONTINGENCY % = 0.25
CONTINGENCY = \$ 1,082.29
BUDGET COST ESTIMATE = \$ 5,411.47

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Bristol Fire - Engine 4									
	Lighting Upgrades	1	ea.	\$ 2,866.00	\$ 2,866.00	1	ea.	\$ 1,106.00	\$ 1,106.00	\$ 3,972.00
	Subtotal				\$ 2,866.00				\$ 1,106.00	

Notes:

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2. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL =	\$	3,972.00
MARKUP % =	\$	0.15
MARKUP =	\$	595.80
SUB-TOTAL w/ OH & P =	\$	4,567.80
CONTINGENCY % =		0.25
CONTINGENCY =	\$	1,141.95
BUDGET COST ESTIMATE =	\$	5,709.75

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Bristol Fire - Engine 5									
	Lighting Upgrades	1	ea.	\$ 3,054.00	\$ 3,054.00	1	ea.	\$ 1,222.50	\$ 1,222.50	\$ 4,276.50
	Subtotal				\$ 3,054.00				\$ 1,222.50	

Notes:

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2. CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL =	\$	4,276.50
MARKUP % =	\$	0.15
MARKUP =	\$	641.48
SUB-TOTAL w/ OH & P =	\$	4,917.98
CONTINGENCY % =		0.25
CONTINGENCY =	\$	1,229.49
BUDGET COST ESTIMATE =	\$	6,147.47

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Senior Center									
	Lighting Upgrades	1	ea.	\$ 10,430.00	\$ 10,430.00	1	ea.	\$ 4,069.50	\$ 4,069.50	\$ 14,499.50
	Subtotal				\$ 10,430.00				\$ 4,069.50	

SUBTOTAL = \$ 14,499.50

MARKUP % = \$ 0.15

MARKUP = \$ 2,174.93

SUB-TOTAL w/ OH & P = \$ 16,674.43

CONTINGENCY % = 0.25

CONTINGENCY = \$ 4,168.61

BUDGET COST ESTIMATE = \$ 20,843.03

Notes:

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4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Main Library									
	Lighting Upgrades	1	ea.	\$ 3,136.00	\$ 3,136.00	1	ea.	\$ 1,567.00	\$ 1,567.00	\$ 4,703.00
	Subtotal				\$ 3,136.00				\$ 1,567.00	

SUBTOTAL = \$ 4,703.00

MARKUP % = \$ 0.15

MARKUP = \$ 705.45

SUB-TOTAL w/ OH & P = \$ 5,408.45

CONTINGENCY % = 0.25

CONTINGENCY = \$ 1,352.11

BUDGET COST ESTIMATE = \$ 6,760.56

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Public Library									
	Lighting Upgrades	1	ea.	\$ 2,156.00	\$ 2,156.00	1	ea.	\$ 1,032.00	\$ 1,032.00	\$ 3,188.00
	Subtotal				\$ 2,156.00				\$ 1,032.00	

SUBTOTAL = \$ 3,188.00

MARKUP % = \$ 0.15

MARKUP = \$ 478.20

SUB-TOTAL w/ OH & P = \$ 3,666.20

CONTINGENCY % = 0.25

CONTINGENCY = \$ 916.55

BUDGET COST ESTIMATE = \$ 4,582.75

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Youth Services - Main Building									
	Lighting Upgrades	1	ea.	\$ 1,582.00	\$ 1,582.00	1	ea.	\$ 825.00	\$ 825.00	\$ 2,407.00
	Subtotal				\$ 1,582.00				\$ 825.00	

SUBTOTAL = \$ 2,407.00

MARKUP % = \$ 0.15

MARKUP = \$ 361.05

SUB-TOTAL w/ OH & P = \$ 2,768.05

CONTINGENCY % = 0.25

CONTINGENCY = \$ 692.01

BUDGET COST ESTIMATE = \$ 3,460.06

Notes:

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4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Public Works - Animal Control									
	Lighting Upgrades	1	ea.	\$ 483.00	\$ 483.00	1	ea.	\$ 210.50	\$ 210.50	\$ 693.50
	Subtotal				\$ 483.00				\$ 210.50	

SUBTOTAL = \$ 693.50

MARKUP % = \$ 0.15

MARKUP = \$ 104.03

SUB-TOTAL w/ OH & P = \$ 797.53

CONTINGENCY % = 0.25

CONTINGENCY = \$ 199.38

BUDGET COST ESTIMATE = \$ 996.91

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Public Works - Community									
	Lighting Upgrades	1	ea.	\$ 211.00	\$ 211.00	1	ea.	\$ 167.00	\$ 167.00	\$ 378.00
	Subtotal				\$ 211.00				\$ 167.00	

SUBTOTAL = \$ 378.00

MARKUP % = \$ 0.15

MARKUP = \$ 56.70

SUB-TOTAL w/ OH & P = \$ 434.70

CONTINGENCY % = 0.25

CONTINGENCY = \$ 108.68

BUDGET COST ESTIMATE = \$ 543.38

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Public Works - Hill Street									
	Lighting Upgrades	1	ea.	\$ 2,103.70	\$ 2,103.70	1	ea.	\$ 1,283.50	\$ 1,283.50	\$ 3,387.20
	Subtotal				\$ 2,103.70				\$ 1,283.50	

SUBTOTAL = \$ 3,387.20

MARKUP % = \$ 0.15

MARKUP = \$ 508.08

SUB-TOTAL w/ OH & P = \$ 3,895.28

CONTINGENCY % = 0.25

CONTINGENCY = \$ 973.82

BUDGET COST ESTIMATE = \$ 4,869.10

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Public Works - City Yard									
	Lighting Upgrades	1	ea.	\$ 6,620.00	\$ 6,620.00	1	ea.	\$ 2,329.00	\$ 2,329.00	\$ 8,949.00
	Subtotal				\$ 6,620.00				\$ 2,329.00	

SUBTOTAL = \$ 8,949.00

MARKUP % = \$ 0.15

MARKUP = \$ 1,342.35

SUB-TOTAL w/ OH & P = \$ 10,291.35

CONTINGENCY % = 0.25

CONTINGENCY = \$ 2,572.84

BUDGET COST ESTIMATE = \$ 12,864.19

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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CDM

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Public Works - Transfer Station Scale House									
	Lighting Upgrades	1	ea.	\$ 1,140.00	\$ 1,140.00	1	ea.	\$ 411.00	\$ 411.00	\$ 1,551.00
	Subtotal				\$ 1,140.00				\$ 411.00	

SUBTOTAL = \$ 1,551.00
MARKUP % = \$ 0.15
MARKUP = \$ 232.65
SUB-TOTAL w/ OH & P = \$ 1,783.65
CONTINGENCY % = 0.25
CONTINGENCY = \$ 445.91
BUDGET COST ESTIMATE = \$ 2,229.56

Notes:

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 3. Bonds not included in estimate.
 4. Escalation not included in estimate.
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Public Works - Transfer Station Hut									
	Lighting Upgrades	1	ea.	\$ 2,503.00	\$ 2,503.00	1	ea.	\$ 874.00	\$ 874.00	\$ 3,377.00
	Subtotal				\$ 2,503.00				\$ 874.00	

SUBTOTAL = \$ 3,377.00
MARKUP % = \$ 0.15
MARKUP = \$ 506.55
SUB-TOTAL w/ OH & P = \$ 3,883.55
CONTINGENCY % = 0.25
CONTINGENCY = \$ 970.89
BUDGET COST ESTIMATE = \$ 4,854.44

Notes:

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 4. Escalation not included in estimate.
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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Operations									
	Lighting Upgrades	1	ea.	\$ 5.00	\$ 5.00	1	ea.	\$ 20.00	\$ 20.00	\$ 25.00
	Subtotal				\$ 5.00				\$ 20.00	

SUBTOTAL = \$ 25.00

MARKUP % = \$ 0.15

MARKUP = \$ 3.75

SUB-TOTAL w/ OH & P = \$ 28.75

CONTINGENCY % = 0.25

CONTINGENCY = \$ 7.19

BUDGET COST ESTIMATE = \$ 35.94

Notes:

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 4. Escalation not included in estimate.
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Headworks									
	Lighting Upgrades	1	ea.	\$ 760.00	\$ 760.00	1	ea.	\$ 274.00	\$ 274.00	\$ 1,034.00
	Subtotal				\$ 760.00				\$ 274.00	

SUBTOTAL = \$ 1,034.00

MARKUP % = \$ 0.15

MARKUP = \$ 155.10

SUB-TOTAL w/ OH & P = \$ 1,189.10

CONTINGENCY % = 0.25

CONTINGENCY = \$ 297.28

BUDGET COST ESTIMATE = \$ 1,486.38

Notes:

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 3. Bonds not included in estimate.
 4. Escalation not included in estimate.
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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Air Blower									
	Lighting Upgrades	1	ea.	\$ 1,140.00	\$ 1,140.00	1	ea.	\$ 411.00	\$ 411.00	\$ 1,551.00
	Subtotal				\$ 1,140.00				\$ 411.00	

SUBTOTAL = \$ 1,551.00

MARKUP % = \$ 0.15

MARKUP = \$ 232.65

SUB-TOTAL w/ OH & P = \$ 1,783.65

CONTINGENCY % = 0.25

CONTINGENCY = \$ 445.91

BUDGET COST ESTIMATE = \$ 2,229.56

Notes:

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Pump House									
	Lighting Upgrades	1	ea.	\$ 760.00	\$ 760.00	1	ea.	\$ 274.00	\$ 274.00	\$ 1,034.00
	Subtotal				\$ 760.00				\$ 274.00	

SUBTOTAL = \$ 1,034.00

MARKUP % = \$ 0.15

MARKUP = \$ 155.10

SUB-TOTAL w/ OH & P = \$ 1,189.10

CONTINGENCY % = 0.25

CONTINGENCY = \$ 297.28

BUDGET COST ESTIMATE = \$ 1,486.38

Notes:

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 - Bonds not included in estimate.
 - Escalation not included in estimate.
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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Sludge Thickening Building									
	Lighting Upgrades	1	ea.	\$ 1,835.00	\$ 1,835.00	1	ea.	\$ 548.00	\$ 548.00	\$ 2,383.00
	Subtotal				\$ 1,835.00				\$ 548.00	

Notes:

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 - Bonds not included in estimate.
 - Escalation not included in estimate.
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SUBTOTAL =	\$	2,383.00
MARKUP % =	\$	0.15
MARKUP =	\$	357.45
SUB-TOTAL w/ OH & P =	\$	2,740.45
CONTINGENCY % =		0.25
CONTINGENCY =	\$	685.11
BUDGET COST ESTIMATE =	\$	3,425.56

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Sludge Disposal									
	Lighting Upgrades	1	ea.	\$ -	\$ -	1	ea.	\$ -	\$ -	\$ -
	Subtotal				\$ -				\$ -	

SUBTOTAL =	\$ -
MARKUP % =	\$ 0.15
MARKUP =	\$ -
SUB-TOTAL w/ OH & P =	\$ -
CONTINGENCY % =	0.25
CONTINGENCY =	\$ -
BUDGET COST ESTIMATE =	\$ -

- Notes:
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Broad Street PS									
	Lighting Upgrades	1	ea.	\$ 160.00	\$ 160.00	1	ea.	\$ 130.00	\$ 130.00	\$ 290.00
	Subtotal				\$ 160.00				\$ 130.00	

SUBTOTAL =	\$ 290.00
MARKUP % =	\$ 0.15
MARKUP =	\$ 43.50
SUB-TOTAL w/ OH & P =	\$ 333.50
CONTINGENCY % =	0.25
CONTINGENCY =	\$ 83.38
BUDGET COST ESTIMATE =	\$ 416.88

- Notes:
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Fax (518) 786-3810

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Cherry Hill PS									
	Lighting Upgrades	1	ea.	\$ 160.00	\$ 160.00	1	ea.	\$ 130.00	\$ 130.00	\$ 290.00
	Subtotal				\$ 160.00				\$ 130.00	

SUBTOTAL =	\$	290.00
MARKUP % =	\$	0.15
MARKUP =	\$	43.50
SUB-TOTAL w/ OH & P =	\$	333.50
CONTINGENCY % =		0.25
CONTINGENCY =	\$	83.38
BUDGET COST ESTIMATE =	\$	416.88

Notes:

- CDM has no control over the cost of labor, materials, equipment, services furnished or market conditions.
- CDM does not guarantee that this opinion will not vary from actual cost, or contractor's bids.
- Bonds not included in estimate.
- Escalation not included in estimate.
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Cross PS									
	Lighting Upgrades	1	ea.	\$ 320.00	\$ 320.00	1	ea.	\$ 260.00	\$ 260.00	\$ 580.00
	Subtotal				\$ 320.00				\$ 260.00	

SUBTOTAL =	\$	580.00
MARKUP % =	\$	0.15
MARKUP =	\$	87.00
SUB-TOTAL w/ OH & P =	\$	667.00
CONTINGENCY % =		0.25
CONTINGENCY =	\$	166.75
BUDGET COST ESTIMATE =	\$	833.75

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Drayla PS									
	Lighting Upgrades	1	ea.	\$ 320.00	\$ 320.00	1	ea.	\$ 260.00	\$ 260.00	\$ 580.00
	Subtotal				\$ 320.00				\$ 260.00	

SUBTOTAL =	\$	580.00
MARKUP % =	\$	0.15
MARKUP =	\$	87.00
SUB-TOTAL w/ OH & P =	\$	667.00
CONTINGENCY % =		0.25
CONTINGENCY =	\$	166.75
BUDGET COST ESTIMATE =	\$	833.75

Notes:

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - East Main PS									
	Lighting Upgrades	1	ea.	\$ 80.00	\$ 80.00	1	ea.	\$ 65.00	\$ 65.00	\$ 145.00
	Subtotal				\$ 80.00				\$ 65.00	

SUBTOTAL =	\$	145.00
MARKUP % =	\$	0.15
MARKUP =	\$	21.75
SUB-TOTAL w/ OH & P =	\$	166.75
CONTINGENCY % =		0.25
CONTINGENCY =	\$	41.69
BUDGET COST ESTIMATE =	\$	208.44

Notes:

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 - Escalation not included in estimate.
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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Ivy PS									
	Lighting Upgrades	1	ea.	\$ 80.00	\$ 80.00	1	ea.	\$ 65.00	\$ 65.00	\$ 145.00
	Subtotal				\$ 80.00				\$ 65.00	

SUBTOTAL =	\$	145.00
MARKUP % =	\$	0.15
MARKUP =	\$	21.75
SUB-TOTAL w/ OH & P =	\$	166.75
CONTINGENCY % =		0.25
CONTINGENCY =	\$	41.69
BUDGET COST ESTIMATE =	\$	208.44

Notes:

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Julia PS									
	Lighting Upgrades	1	ea.	\$ 80.00	\$ 80.00	1	ea.	\$ 65.00	\$ 65.00	\$ 145.00
	Subtotal				\$ 80.00				\$ 65.00	

SUBTOTAL =	\$	145.00
MARKUP % =	\$	0.15
MARKUP =	\$	21.75
SUB-TOTAL w/ OH & P =	\$	166.75
CONTINGENCY % =		0.25
CONTINGENCY =	\$	41.69
BUDGET COST ESTIMATE =	\$	208.44

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Location: Bristol, CT
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Lake PS									
	Lighting Upgrades	1	ea.	\$ 80.00	\$ 80.00	1	ea.	\$ 65.00	\$ 65.00	\$ 145.00
	Subtotal				\$ 80.00				\$ 65.00	

SUBTOTAL =	\$	145.00
MARKUP % =	\$	0.15
MARKUP =	\$	21.75
SUB-TOTAL w/ OH & P =	\$	166.75
CONTINGENCY % =		0.25
CONTINGENCY =	\$	41.69
BUDGET COST ESTIMATE =	\$	208.44

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Lufkin PS									
	Lighting Upgrades	1	ea.	\$ 80.00	\$ 80.00	1	ea.	\$ 65.00	\$ 65.00	\$ 145.00
	Subtotal				\$ 80.00				\$ 65.00	

SUBTOTAL =	\$	145.00
MARKUP % =	\$	0.15
MARKUP =	\$	21.75
SUB-TOTAL w/ OH & P =	\$	166.75
CONTINGENCY % =		0.25
CONTINGENCY =	\$	41.69
BUDGET COST ESTIMATE =	\$	208.44

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Matthews PS									
	Lighting Upgrades	1	ea.	\$ 240.00	\$ 240.00	1	ea.	\$ 195.00	\$ 195.00	\$ 435.00
	Subtotal				\$ 240.00				\$ 195.00	

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL =	\$	435.00
MARKUP % =	\$	0.15
MARKUP =	\$	65.25
SUB-TOTAL w/ OH & P =	\$	500.25
CONTINGENCY % =		0.25
CONTINGENCY =	\$	125.06
BUDGET COST ESTIMATE =	\$	625.31

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Middle PS									
	Lighting Upgrades	1	ea.	\$ 240.00	\$ 240.00	1	ea.	\$ 195.00	\$ 195.00	\$ 435.00
	Subtotal				\$ 240.00				\$ 195.00	

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL =	\$	435.00
MARKUP % =	\$	0.15
MARKUP =	\$	65.25
SUB-TOTAL w/ OH & P =	\$	500.25
CONTINGENCY % =		0.25
CONTINGENCY =	\$	125.06
BUDGET COST ESTIMATE =	\$	625.31

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Minor PS									
	Lighting Upgrades	1	ea.	\$ 240.00	\$ 240.00	1	ea.	\$ 195.00	\$ 195.00	\$ 435.00
	Subtotal				\$ 240.00				\$ 195.00	

Notes:

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3. Bonds not included in estimate.
4. Escalation not included in estimate.

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SUBTOTAL =	\$	435.00
MARKUP % =	\$	0.15
MARKUP =	\$	65.25
SUB-TOTAL w/ OH & P =	\$	500.25
CONTINGENCY % =		0.25
CONTINGENCY =	\$	125.06
BUDGET COST ESTIMATE =	\$	625.31

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Boivin PS									
	Lighting Upgrades	1	ea.	\$ 160.00	\$ 160.00	1	ea.	\$ 130.00	\$ 130.00	\$ 290.00
	Subtotal				\$ 160.00				\$ 130.00	

Notes:

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4. Escalation not included in estimate.

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SUBTOTAL =	\$	290.00
MARKUP % =	\$	0.15
MARKUP =	\$	43.50
SUB-TOTAL w/ OH & P =	\$	333.50
CONTINGENCY % =		0.25
CONTINGENCY =	\$	83.38
BUDGET COST ESTIMATE =	\$	416.88

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control - Tyler PS									
	Lighting Upgrades	1	ea.	\$ 240.00	\$ 240.00	1	ea.	\$ 195.00	\$ 195.00	\$ 435.00
	Subtotal				\$ 240.00				\$ 195.00	

SUBTOTAL =	\$	435.00
MARKUP % =	\$	0.15
MARKUP =	\$	65.25
SUB-TOTAL w/ OH & P =	\$	500.25
CONTINGENCY % =		0.25
CONTINGENCY =	\$	125.06
BUDGET COST ESTIMATE =	\$	625.31

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Location: Bristol, CT
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Checked by: JM

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	Water Pollution Control Plant (WPCP)									
	Motor Upgrades	1	ea.	\$ 158,587.00	\$ 158,587.00	1	ea.	\$ 11,099.00	\$ 11,099.00	\$ 169,686.00
	Subtotal				\$ 158,587.00				\$ 11,099.00	

Notes:

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SUBTOTAL =	\$	169,686.00
MARKUP % =	\$	0.15
MARKUP =	\$	25,452.90
SUB-TOTAL w/ OH & P =	\$	195,138.90
CONTINGENCY % =		0.25
CONTINGENCY =	\$	48,784.73
BUDGET COST ESTIMATE =	\$	243,923.63

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	WPCP Pump Stations									
	Motor Upgrades	1	ea.	\$ 189,583.00	\$ 189,583.00	1	ea.	\$ 19,880.00	\$ 19,880.00	\$ 209,463.00
	Subtotal				\$ 189,583.00				\$ 19,880.00	

Notes:

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- Bonds not included in estimate.
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SUBTOTAL =	\$	209,463.00
MARKUP % =	\$	0.15
MARKUP =	\$	31,419.45
SUB-TOTAL w/ OH & P =	\$	240,882.45
CONTINGENCY % =		0.25
CONTINGENCY =	\$	60,220.61
BUDGET COST ESTIMATE =	\$	301,103.06

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ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Location: Bristol, CT
Estimate by: RG
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ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	WTP - High Service Pump Station									
	Motor Upgrades	1	ea.	\$ 21,840.00	\$ 21,840.00	1	ea.	\$ 1,012.00	\$ 1,012.00	\$ 22,852.00
	Subtotal				\$ 21,840.00				\$ 1,012.00	

Notes:

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- Escalation not included in estimate.

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SUBTOTAL =	\$	22,852.00
MARKUP % =	\$	0.15
MARKUP =	\$	3,427.80
SUB-TOTAL w/ OH & P =	\$	26,279.80
CONTINGENCY % =		0.25
CONTINGENCY =	\$	6,569.95
BUDGET COST ESTIMATE =	\$	32,849.75

ITEM	DESCRIPTION	QTY	UNIT	MATERIAL UNIT COST	MATERIAL SUBTOTAL	QTY	UNIT	LABOR COST	LABOR SUBTOTAL	TOTAL
1	WTP - Pump Station and Well Houses									
	Motor Upgrades	1	ea.	\$ 56,212.00	\$ 56,212.00	1	ea.	\$ 2,598.00	\$ 2,598.00	\$ 58,810.00
	Subtotal				\$ 56,212.00				\$ 2,598.00	

Notes:

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- Bonds not included in estimate.
- Escalation not included in estimate.

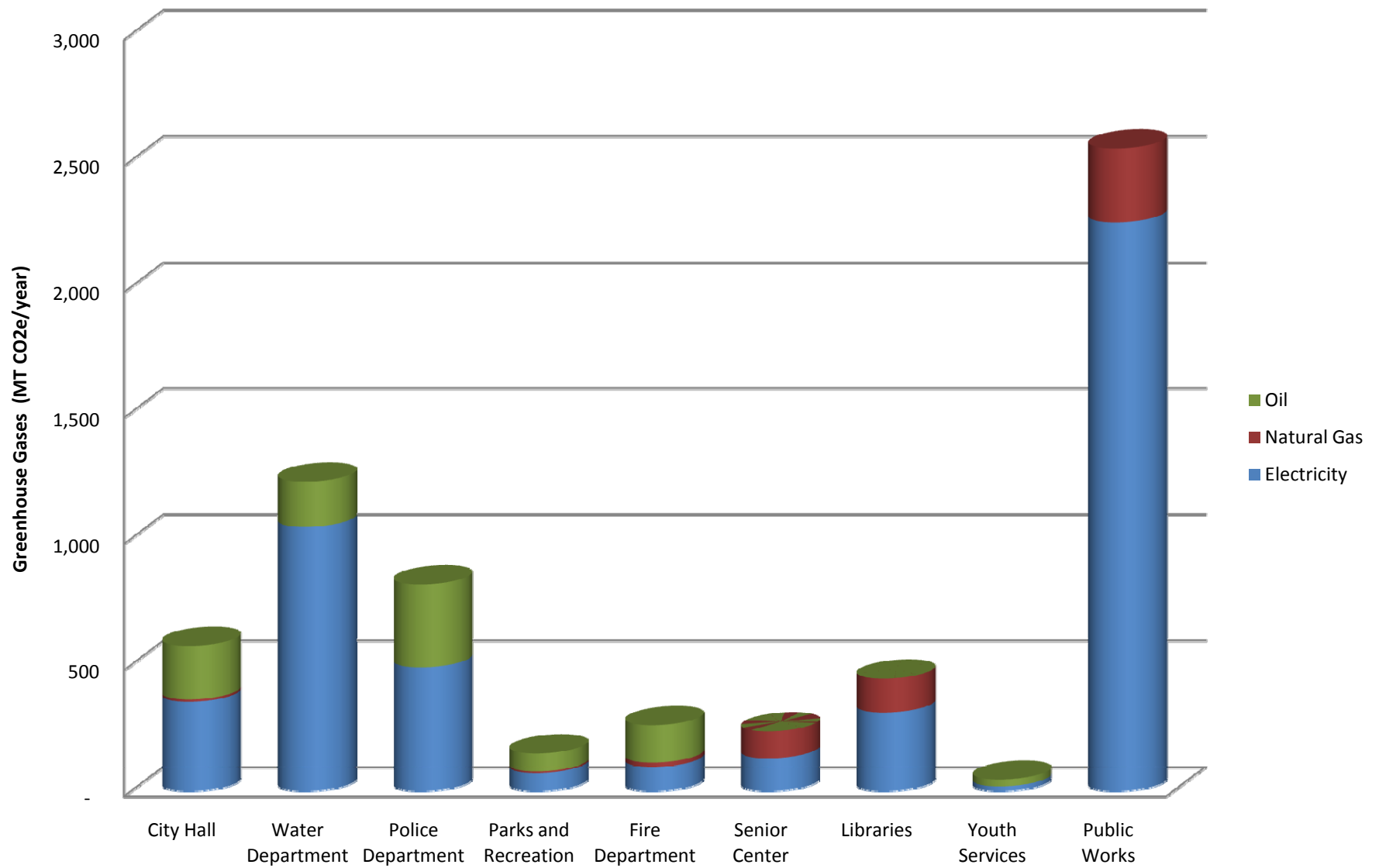
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SUBTOTAL =	\$	58,810.00
MARKUP % =	\$	0.15
MARKUP =	\$	8,821.50
SUB-TOTAL w/ OH & P =	\$	67,631.50
CONTINGENCY % =		0.25
CONTINGENCY =	\$	16,907.88
BUDGET COST ESTIMATE =	\$	84,539.38

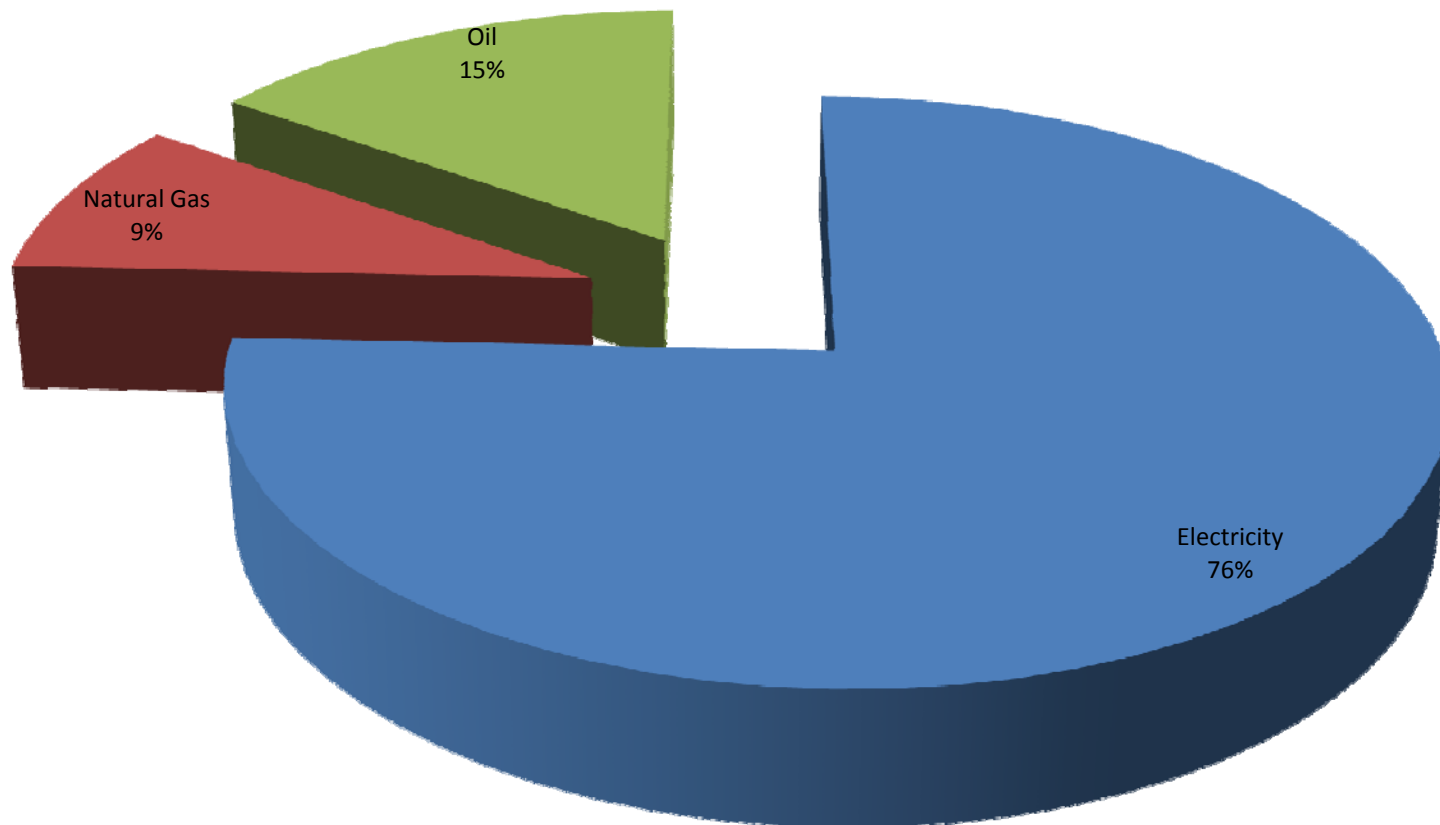
APPENDIX N

SUMMARY OF ANNUAL GHG EMISSIONS

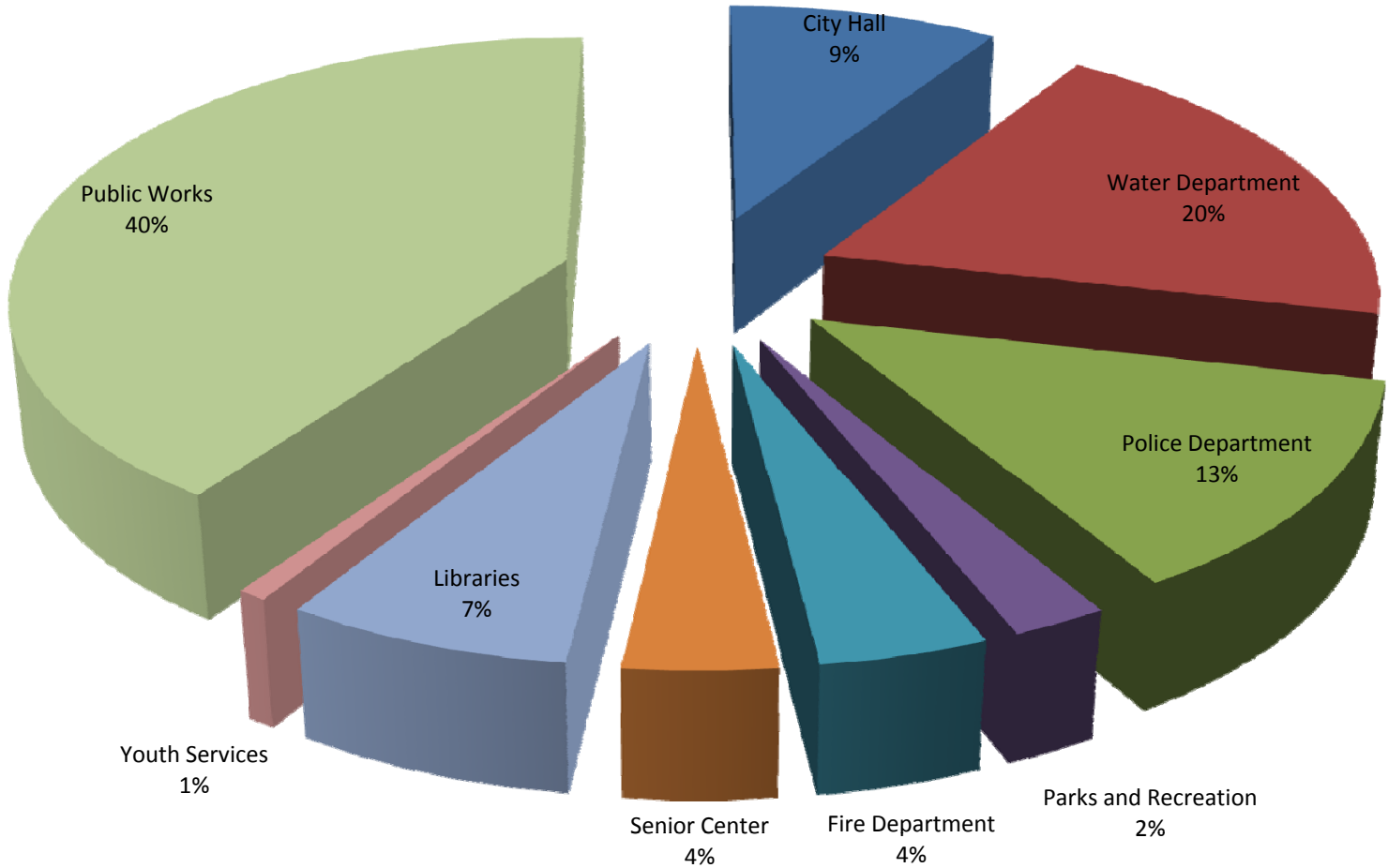
Direct and Indirect Greenhouse Gas Emissions By Departments



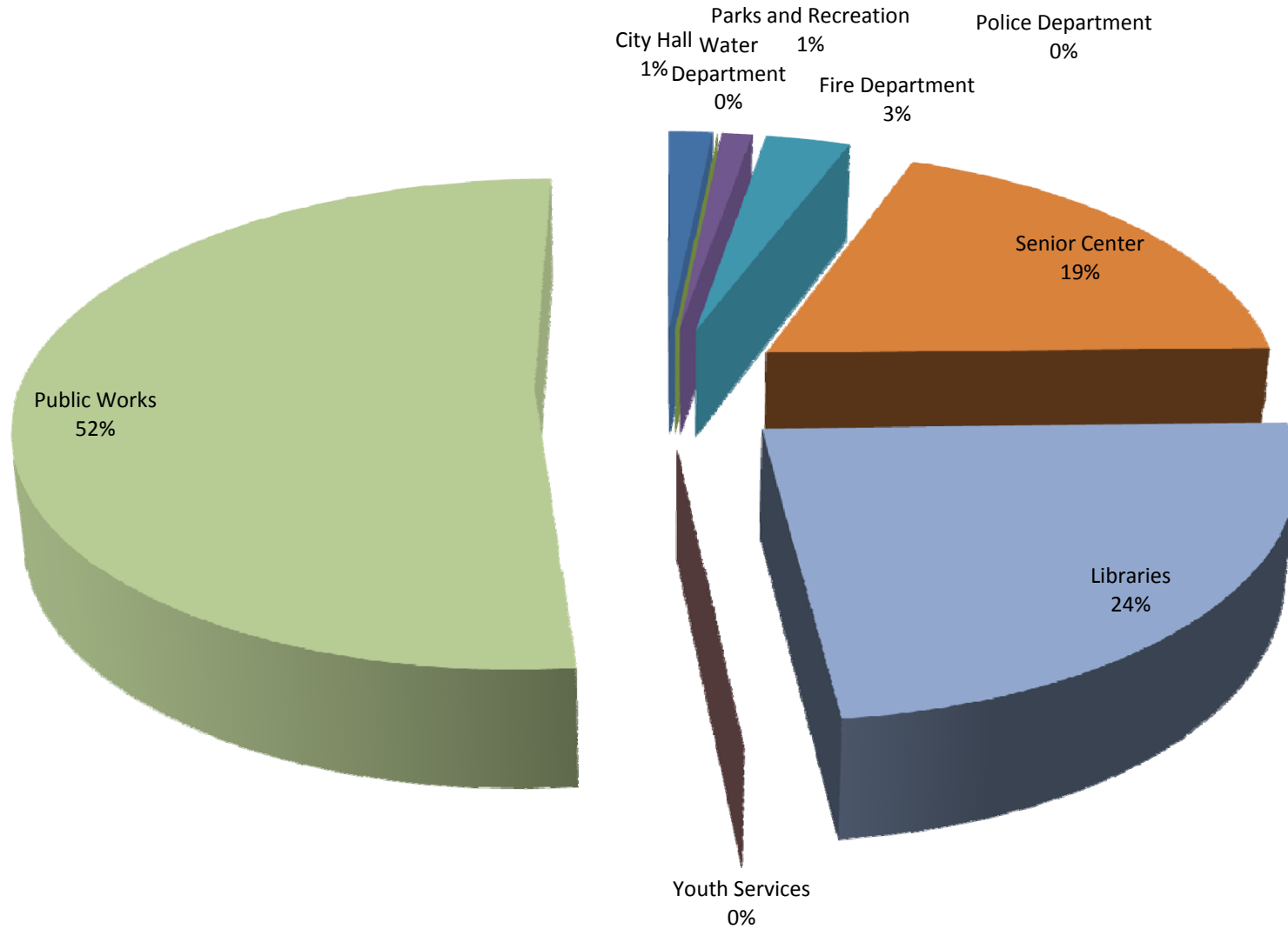
Sources of GHG Emissions City of Bristol



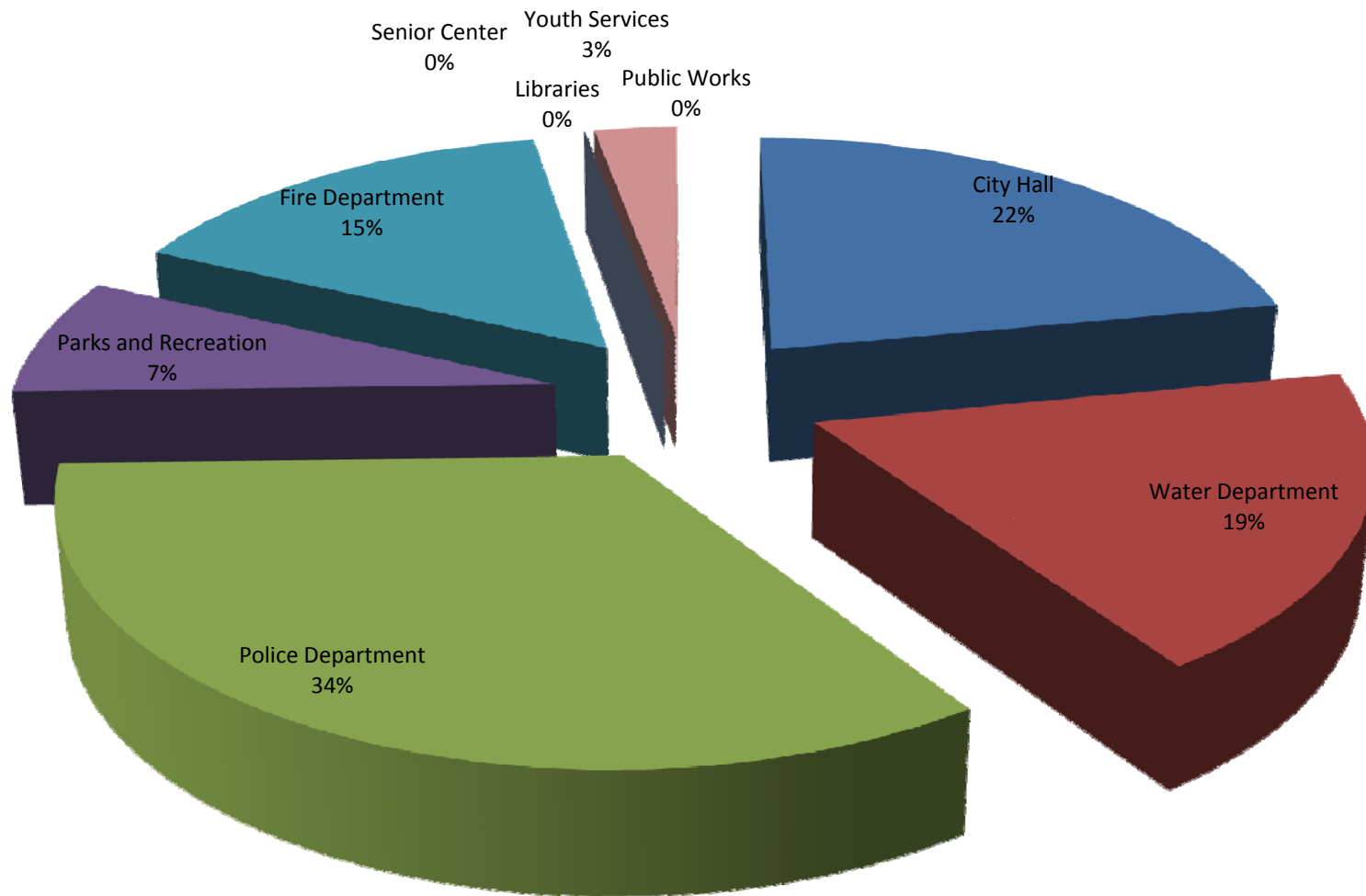
Total GHG Emissions Department Contributions



Direct Emissions (Natural Gas) Individual Department Contributions



Direct Emissions (Oil) Individual Department Contributions



Indirect GHG Emissions (Electricity) Individual Department Contributions

