ALLEGHENY COUNTY ENERGY PROGRAM FOR MUNICIPALITIES

ENERGY AUDIT REPORT

FOR

MCCANDLESS TOWNSHIP

9955 GRUBBS RD

WEXFORD, PA 15090

OCTOBER 14, 2010

PREPARED BY:

LIME ENERGY CONSULTING & TECHNICAL SERVICES

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1.0 EXECUTIVE SUMMARY

Allegheny County Energy Program contracted with Lime Energy Consulting & Technical Services to perform a targeted energy audit in order to assess the financial benefits of upgrading the Allegheny County facilities with more efficient equipment and systems. The study included the facilities at the McCandless Township. Lime Energy engineers visited the location and performed an audit earlier this year. Utility incentives may be available for some of the ECMs proposed. Where available, the incentive amount has been estimated and is included in the Summary Table. The programs may change from the current offerings.

1.1 RECOMMENDED ENERGY CONSERVATION MEASURES (ECMs)

ECM ID	Description	kW Saved	kWh Saved	Therms Saved	Water Saved (kgal.)	Estimated Cost Savings	Estimated ECM Cost	Rebate	Payback (Yrs.)
1.0	Lighting Retrofit	18.7	49,952	0	0	$4,700	$19,695	$6,316	2.8
2.0	Programmable Thermostats	0.0	16,546	1,952	0.0	$3,509	$29,461	$0	8.4
4.2	Insulation	0.0	0	3	0.0	$3	$32	$0	12.7
6.0	Water Conservation	0.0	0	48	15.6	$144	$574	$0	4.0
Total Energy Program Economics:		18.7	66,498	2,003	15.6	$8,356	$49,763	$6,316	5.2

Table 1: Summary of Recommended ECM Savings

2.0 BUILDING INFORMATION

The McCandless Township building is located at 9955 Grubbs Rd, Wexford, PA 15090. The building is a 2-story commercial office structure built in 1959, (approximately 13,000 square feet) and expanded with a 5,320 square feet addition in 1993 for a total of 18,320 square feet. Its operating hours are weekdays from 9AM-5PM. This building houses the police department on the first level and the administrative, building, and zoning, and fire department offices in the second level. There is approximately 6 officers on duty every shift and 25 employees that work at the municipal building.

The Public Works building is located adjacent to the municipal building and was briefly inspected during the audit. The Public Works building houses the public works vehicles and offices, along with storage for other tools and equipment. The public works building is approximately 6,000 square feet. There are about 20 employees at the public works that are transiently in the building during the day.

2.1 BUILDING DESCRIPTION

The McCandless municipal building is made of concrete block with brick overlay and has a flat rubber membrane rooftop. The building is conditioned by five main RTUs (3 Bryants, 1 Lennox, 1 Carrier), which supply heating and cooling to the building, with two small Mitsubishi split system units which serves small offices/server rooms. The building also has supplemental radiator wall heaters which receive heating water from the 636,000 BTUh Harsco Industries Patterson-Kelley Modu-Fire forced draft gas-fired boiler. The wall radiators have thermostats that are separate from the RTUs and are manual Honeywell thermostats. The thermostats that control the RTUs are usually programmable thermostats and are set at 68 °F heating, 74 °F cooling.

There are two Modine DFG/DFP100 (100,000 Input BTUh, 80,000 Output BTUh, 3704 CFM) furnaces in the police garage. They are currently controlled by a switch and it is recommended that a timer and/or a thermostat with a 50 °F setpoint be installed.

The municipal building has a mixture of T8 and T12 4-ft linear fluorescent lamps. It is recommended that all lighting fixtures be upgraded to T8 fluorescent lamps and compact fluorescents. Lighting controls with motion sensors are also recommended in private offices and seldomly used areas.

The restroom fixtures at the facility are currently standard (1.6 gpf toilets, 1.0 gpf urinals). It is recommended that they be changed to water-efficient fixtures.

The Public Works building has six Space-Ray LTS140 tube heaters which heat the garage areas and a Lennox RTU unit which provides heating and cooling to the office areas. The lighting fixtures are primarily T12 fluorescent and incandescent lighting and should be replaced with T8 fluorescent and compact fluorescent lighting.

2.2 ENERGY HISTORY

This section provides details on annual electric, gas, and water use for the McCandless Township. Utility data shown below was obtained from:

Electric: Pennsylvania Power Company (Penn Power)

Gas: Equitable Gas (No gas cost data was available. A conservative rate of $1.00 per Therm was applied to estimate dollar savings.)

Water: West View Water Authority

Complete data is provided as available.

Mo/Yr	P/T (kW)	Usage (kWh)	Demand ($)	Total ($)
Jun-09		16,160	$169	$1,528
Jul-09		16,240	$161	$1,527
Aug-09		17,640	$166	$1,650
Sep-09		14,000	$168	$1,345
Oct-09		14,400	$139	$1,350
Nov-09		15,200	$139	$1,417
Dec-09		14,200	$139	$1,333
Jan-10		17,760	$139	$1,633
Feb-10		14,120	$139	$1,327
Mar-10		15,080	$139	$1,418
Apr-10		17,040	$162	$1,616
May-10		16,080	$164	$1,536
Totals:		187,920	$1,822	$17,681

Table 2: Electric Consumption Summary

Mo/Yr	Total Therms	Total Cost
Totals:		

Table 3: Gas Consumption Summary

Mo/Yr	Total kGal Used	Total kGal Cost
Apr-09	24.0	$102
Jul-09	33.0	$132
Oct-09	55.0	$202
Jan-10	24.0	$104
Apr-10	24.0	$121
Totals:	160.0	$662

Table 4: Water Consumption Summary

3.0 ENERGY CONSERVATION MEASURES

This section outlines our findings and recommendations for improving the energy efficiency of the facilities. The energy conservation recommendations focus on equipment upgrade opportunities for lighting, HVAC systems, improved controls, and water conservation, as applicable in this building.

ECM 1.0 Lighting System Upgrades

General Project Scope

Lime Energy auditors conducted a lighting survey of all interior and exterior lights in McCandless Township, as applicable. Existing lighting systems were surveyed for retrofit opportunities. As a result, old technologies such as fluorescent T12 lamps and magnetic ballasts, high-intensity discharge (HID) fixtures, and incandescent lamps were considered for retrofit to more efficient energy efficient technologies. Energy efficient compact fluorescents, and T8 or T5 linear fluorescent lamps and ballasts, were identified as replacements using low wattage lamps, electronic ballasts, and retrofit kits. Opportunities to upgrade to LED technology were identified where applicable.

Assumptions for Current Operating Conditions

- The lamps, ballasts and fixtures targeted for retrofit are listed in the lighting table in the appendix, including quantity, type, wattage, and operating hours.

Assumptions for Proposed Operating Conditions

- The proposed upgrades are shown in the lighting table in the appendix, along with any changes to the current conditions.

Implementation Approach

- The lighting system may be upgraded by a qualified contractor. For optimal return on investment, conducting a comprehensive upgrade of the fixtures as listed is recommended.

Projected Annual Energy Savings

Existing		Proposed		Savings		Cost Savings	Initial Cost	Payback
E-kW	E-kWh	P-kW	P-kWh	S-kW	S-kWh	$	$	Years
47	123,790	29	73,838	19	49,952	4,700	19,695	2.8

ECM 2.0 Programmable Thermostats

General Project Scope

The systems providing the heating and cooling at the McCandless Township Municipal and Public Works buildings are proposed for programmable thermostat automation upgrade. The existing thermostats will be replaced with wireless thermostats. Recommended system features include:

- On/off time scheduling
- Separate heating and cooling setpoints
- Night setback control

Assumptions for Current Operating Conditions

- Baseline HVAC energy use was based on existing units observed during the site audit.
- Existing operating hours were based on the specific conditions of the building and information provided by the occupants.

Assumptions for Proposed Operating Conditions

- The energy and cost reduction potential was estimated based on programming the equipment for proper operating hours and temperature setpoints:
  Cooling Setpoint: 76 degrees F occupied and 85 degrees F unoccupied.
  Heating Setpoint: 70 degrees F occupied and 60 degrees F unoccupied.

Implementation Approach

- Wireless thermostats may be optimized by a qualified contractor.

Projected Annual Energy Savings

Existing			Proposed			Savings			Cost Savings	Initial Cost	Payback
E-kW	E-kWh	E-Therms	P-kW	P-kWh	P-Therms	S-kW	S-kWh	S-Therms	$	$	Years
0	67,999	13,404	0	51,452	11,452	0	16,546	1,952	3,509	29,461	8.40

ECM 4.2 Insulation

General Project Scope

Thermal insulation is recommended to be installed on approximately 3 feet of the domestic hot water tank piping. The energy savings available by installing insulation will result in an attractive payback period.

Insulate DHW pipe

Assumptions for Current Operating Conditions

- Baseline energy consumption was based on the existing equipment observed during the site audit.
- Existing operating hours were based on the specific conditions of the building and information provided by the building occupants.

Assumptions for Proposed Operating Conditions

- The energy and cost reduction potential was estimated for installing insulating material with the final R value greater than 20.

Implementation Approach

- Conduct engineering design to specify the appropriate insulating material and installation requirements.
- Select a qualified contractor to install the insulation.

Projected Annual Energy Savings

Existing			Proposed			Savings			Cost Savings	Initial Cost	Payback
E-kW	E-kWh	E-Therms	P-kW	P-kWh	P-Therms	S-kW	S-kWh	S-Therms	$	$	Years
0	0	3	0	0	0	0	0	3	3	32	12.68

ECM 6.0 Water Conservation

General Project Scope

Faucets, toilets, urinals, and showers have been surveyed at McCandless Township Municipal building. Existing gallons per minute flow rates were recorded for water conservation considerations. This ECM proposes the faucet aerators be replaced with high efficiency equivalents.

Assumptions for Current Operating Conditions

- Existing use is based on the number of people occupying the building.
- Existing operating hours are based on the specific conditions of the building.

Assumptions for Proposed Operating Conditions

- The energy and cost reduction potential is estimated for replacement of (12) 2.0 gpm faucet aerators with 0.5 gpm equivalent faucet aerators.

Implementation Approach

- The water conserving fixtures may be installed by a qualified plumbing contractor.

Projected Annual Energy Savings

Existing			Proposed			Savings			Cost Savings	Initial Cost	Payback
E-kWh	E-Therms	E-H2O (kgal)	P-kWh	P-Therms	P-H2O (kgal)	S-kWh	S-Therms	S-H2O (kgal)	$	$	Years
0	73	79.7	0	25	64.1	0	48	15.6	144	574	3.99

5.0 ADDITIONAL MEASURES

This section outlines additional recommendations for improving the energy efficiency of the facilities; however, the energy conservation measures found might not be feasible or cost effective in this building.

ECM 2.6 Premium Efficiency Motors

General Project Scope

The motors furnished for older HVAC system fans and pumps are inefficient compared to new premium efficiency motors available. Replacing the older motors with premium efficiency models were explored for this facility; however, due to low runtime hours and small existing motor sizes, the savings associated with this measure does not fit with this particular program.

Premium efficiency motors are specified by motor manufacturers to meet NEMA standards. Energy savings will be achieved by reducing the energy required for the supply fans serving 5 Municipal building RTUs, 2 Municipal building Mitsubishi split systems and 1 Public Works building roof top air handler units.

Assumptions for Current Operating Conditions

- Baseline motor energy consumption was based on the equipment information collected during the building survey, and occupancy schedules provided by the occupants.
- Existing motor efficiencies are from the State of Pennsylvania Act 129 Technical Resource Manual.

Assumptions for Proposed Operating Conditions

- The proposed motor efficiencies are from State of Pennsylvania Act 129 Technical Resource Manual.

Implementation Approach

- The motors are recommended to be replaced by a qualified electrician.

Projected Annual Energy Savings

Existing			Proposed			Savings			Cost Savings	Initial Cost	Payback
E-kW	E-kWh	E-Therms	P-kW	P-kWh	P-Therms	S-kW	S-kWh	S-Therms	$	$	Years
0	21,875	0	0	21,221	0	0	653	0	61	3,847	62.57

Appendix

Lighting Survey Data

Bldgid	Line #	Floor	CeilHt	Room Description	Existing Description	EQty	EKW	EkWh	Proposed Description	PQty	PKW	PkWh	KWSaved	kWhSaved
69	1		8	Lobby	3-light 2x4 recessed troffer w/ 32 watt T8 lamps	6	0.51	1272.96	RLRB 3-lamp low power electronic ballast & 4' 28 watt T8 lamps	6	0.378	943.488	0.132	329.472
69	2		8	Conference Room	3-light 1x2 recessed troffer w/ 17 watt T8 lamps	9	0.423	219.96	No Change	9	0.423	219.96	0	0
69	3		8	Meeting Room	3-light 2x4 recessed troffer w/ 34 watt T12 lamps	2	0.26	135.2	RLRB 3-lamp low power electronic ballast & 4' 28 watt T8 lamps	2	0.126	65.52	0.134	69.68
69	4		8	Open Office	2-light 4' up/downlight suspended 4' body w/ 32 watt T8 lamps	22	1.276	2654.08	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	22	0.924	1921.92	0.352	732.16
69	5		8	Kitchen	2-light 2x4 recessed troffer w/ 32 watt T8 lamps	4	0.232	301.6	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	4	0.168	218.4	0.064	83.2
69	6		8	Office	2-light 2x4 recessed troffer w/ 32 watt T8 lamps	4	0.232	482.56	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	4	0.168	349.44	0.064	133.12
69	7		8	Office	2-light 2x4 recessed troffer w/ 32 watt T8 lamps	6	0.348	723.84	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	6	0.252	524.16	0.096	199.68
69	8		8	File Room	3-light 1x2 recessed troffer w/ 17 watt T8 lamps	6	0.282	586.56	No Change	6	0.282	586.56	0	0
69	9		8	Assembly Room	4-light 4' tandem up/down suspended w/ 4 32 watt T8 lamps	9	1.008	209.664	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	9	0.738	153.504	0.27	56.16
69	10		8	Assembly Room	3-light 1x2 recessed troffer w/ 17 watt T8 lamps	3	0.141	29.328	No Change	3	0.141	29.328	0	0
69	11		8	Assembly Room	1-light 120 watt incandescent par lamp recessed downlight on dimmer	2	0.24	49.92	No Change	2	0.24	49.92	0	0
69	12		8	Mens Restroom	1-light 4' strip w/ 34 watt T12 lamp	1	0.046	114.816	RLRB 1-lamp low power electronic ballast & 4' 28 watt T8 lamp	1	0.022	54.912	0.024	59.904
69	13		8	Mens Restroom	1-light 32 watt compact fluorescent recessed downlight	1	0.034	84.864	No Change	1	0.034	84.864	0	0

Lighting Survey Data

Bldgid	Line #	Floor	CeilHt	Room Description	Existing Description	EQty	EKW	EkWh	Proposed Description	PQty	PKW	PkWh	KWSaved	kWhSaved
69	14		8	Womens Restroom	1-light 32 watt compact fluorescent recessed downlight	2	0.068	169.728	No Change	2	0.068	169.728	0	0
69	15		8	Hallway	1-light 32 watt compact fluorescent recessed downlight	5	0.17	424.32	No Change	5	0.17	424.32	0	0
69	16		8	Lobby	1-light 75 watt incandescent halogen par lamp recessed downlight	4	0.3	748.8	RL 1-lamp 15 watt compact fluorescent screw-in with R30 reflector	4	0.06	149.76	0.24	599.04
69	17		8	Hallway	2-light 2x4 recessed troffer w/ 34 watt T12 lamps	2	0.168	419.328	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	2	0.084	209.664	0.084	209.664
69	18		8	Office	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	4	0.672	1397.76	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	4	0.328	682.24	0.344	715.52
69	19		8	Office	2-light 13 watt compact fluorescent recessed downlight	2	0.06	124.8	No Change	2	0.06	124.8	0	0
69	20		8	Township Manager	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	6	1.008	2096.64	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	6	0.492	1023.36	0.516	1073.28
69	21		8	Office	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	2	0.336	698.88	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	2	0.164	341.12	0.172	357.76
69	22		8	Hallway	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	6	1.008	2515.968	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	6	0.492	1228.032	0.516	1287.936
69	23		8	Office	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	4	0.672	1397.76	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	4	0.328	682.24	0.344	715.52
69	24		8	Building & Zoning Office	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	2	0.336	698.88	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	2	0.164	341.12	0.172	357.76
69	25		8	Building & Zoning Office	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	2	0.336	698.88	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	2	0.164	341.12	0.172	357.76
69	26		8	Fire Marshall Office	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	4	0.672	1397.76	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	4	0.328	682.24	0.344	715.52

Lighting Survey Data

Bldgid	Line #	Floor	CeilHt	Room Description	Existing Description	EQty	EKW	EkWh	Proposed Description	PQty	PKW	PkWh	KWSaved	kWhSaved
69	27		8	Fire Office	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	3	0.504	1048.32	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	3	0.246	511.68	0.258	536.64
69	28		8	Fire Office	2-light 13 watt compact fluorescent recessed downlight	6	0.18	374.4	No Change	6	0.18	374.4	0	0
69	29		8	Stairs	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	2	0.336	2935.296	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	2	0.164	1432.704	0.172	1502.592
69	30		8	Stairs	1-light 100 watt halogen recessed downlight	1	0.1	873.6	RL 1-lamp 23 watt compact fluorescent screw-in with Par38 reflector	1	0.023	200.928	0.077	672.672
69	31		8	Basement Lobby	4-light 4' industrial w/ 32 watt T8 lamps	1	0.112	279.552	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	1	0.082	204.672	0.03	74.88
69	32		8	Building & Zoning Office	3-light 2x4 recessed troffer w/ 32 watt T8 lamps	4	0.34	707.2	RLRB 3-lamp low power electronic ballast & 4' 28 watt T8 lamps	4	0.252	524.16	0.088	183.04
69	33		8	Building & Zoning Office	2-light 13 watt compact fluorescent recessed downlight	2	0.06	124.8	No Change	2	0.06	124.8	0	0
69	34		8	Building & Zoning Office	2-light 8' strip w/ 60 watt T12 lamps	1	0.143	297.44	RLRB 2-lamp standard power electronic ballast & 8' 54 watt T8 lamps	1	0.085	176.8	0.058	120.64
69	35		8	Data Room	2-light 2x4 recessed troffer w/ 32 watt T8 lamps	2	0.116	289.536	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	2	0.084	209.664	0.032	79.872
69	36		8	Under Stairs	1-light 60 watt incandescent in socket	3	0.18	1572.48	RL 1-lamp 13 watt compact fluorescent spiral screw-in	3	0.039	340.704	0.141	1231.776
69	37		8	Firefighter Storage	3-light 4' industrial w/ 32 watt T8 lamps	3	0.255	530.4	RLRB 3-lamp low power electronic ballast & 4' 28 watt T8 lamps	3	0.189	393.12	0.066	137.28
69	38		8	Offices	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	6	1.008	2096.64	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	6	0.492	1023.36	0.516	1073.28
69	39		8	Offices	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	2	0.336	698.88	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	2	0.164	341.12	0.172	357.76

Lighting Survey Data

Bldgid	Line #	Floor	CeilHt	Room Description	Existing Description	EQty	EKW	EkWh	Proposed Description	PQty	PKW	PkWh	KWSaved	kWhSaved
69	40		8	Garage	2-light 8' industrial w/ 60 watt T12 lamps	6	0.858	2498.496	RLRB 2-lamp standard power electronic ballast & 8' 54 watt T8 lamps	6	0.51	1485.12	0.348	1013.376
69	41		8	Police Lobby	2-light 13 watt compact fluorescent recessed downlight	8	0.24	599.04	No Change	8	0.24	599.04	0	0
69	42		8	Lieutenant	2-light 2x4 recessed troffer w/ 32 watt T8 lamps	4	0.232	482.56	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	4	0.168	349.44	0.064	133.12
69	43		8	Police Office	2-light 2x4 recessed troffer w/ 32 watt T8 lamps	10	0.58	5066.88	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	10	0.42	3669.12	0.16	1397.76
69	44		8	Mechanical	1-light 32 watt compact fluorescent recessed downlight	4	0.136	49.504	No Change	4	0.136	49.504	0	0
69	45		8	Police Restroom	1-light 4' strip w/ 34 watt T12 lamp	1	0.046	114.816	RLRB 1-lamp low power electronic ballast & 4' 28 watt T8 lamp	1	0.022	54.912	0.024	59.904
69	46		8	Police Restroom	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	1	0.168	419.328	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	1	0.082	204.672	0.086	214.656
69	47		8	Police Copy Room	2-light 2x4 recessed troffer w/ 32 watt T8 lamps	1	0.058	120.64	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	1	0.042	87.36	0.016	33.28
69	48		8	Storage	1-light 60 watt incandescent in socket	1	0.06	21.84	RL 1-lamp 13 watt compact fluorescent spiral screw-in	1	0.013	4.732	0.047	17.108
69	49		8	Squad Meeting Room	3-light 2x4 recessed troffer w/ 32 watt T8 lamps	8	0.68	353.6	RLRB 3-lamp low power electronic ballast & 4' 28 watt T8 lamps	8	0.504	262.08	0.176	91.52
69	50		8	Garage	2-light industrial w/ 32 watt T8 lamps	13	0.754	2195.648	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	13	0.546	1589.952	0.208	605.696
69	51		8	Mens Locker	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	9	1.512	8805.888	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	9	0.738	4298.112	0.774	4507.776
69	52		8	Squad Room	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	8	1.344	2515.968	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	8	0.656	1228.032	0.688	1287.936

Lighting Survey Data

Bldgid	Line #	Floor	CeilHt	Room Description	Existing Description	EQty	EKW	EkWh	Proposed Description	PQty	PKW	PkWh	KWSaved	kWhSaved
69	53		8	Interview Room	2-light 2x4 recessed troffer w/ 34 watt T12 lamps	2	0.168	61.152	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	2	0.084	30.576	0.084	30.576
69	54		8	Cell	1-light 60 watt incandescent jar	1	0.06	524.16	RL 1-lamp 13 watt compact fluorescent spiral screw-in	1	0.013	113.568	0.047	410.592
69	55		8	Womens Restroom	2-light 4' strip w/ 32 watt T8 lamps	2	0.116	289.536	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	2	0.084	209.664	0.032	79.872
69	56		8	Womens Restroom	2-light 2x2 recessed troffer w/ 35 watt T12 U-6 lamps	2	0.146	364.416	RLRB 3-lamp low power electronic ballast & 2' 17 watt T8 lamps w/ White Reflector Kit	2	0.08	199.68	0.066	164.736
69	57		16	Garage	1-light 175 watt metal halide low bay	22	4.73	13773.76	NF 3-lamp T5 pendant box fixture kit with 54 watt lamps & electronic ballast	22	3.938	11467.46	0.792	2306.304
69	58		16	Garage	4-light 8' industrial w/ 60 watt T12 lamps	36	10.3	29981.95	RLRB 4-lamp standard power electronic ballast & 8' 54 watt T8 lamps	36	6.12	17821.44	4.176	12160.512
69	59		8	Upstairs	2-light 4' strip w/ 32 watt T8 lamps	7	0.406	3546.816	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	7	0.294	2568.384	0.112	978.432
69	60		8	Map Room	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	4	0.672	1397.76	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	4	0.328	682.24	0.344	715.52
69	61		8	Print Room	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	4	0.672	1397.76	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	4	0.328	682.24	0.344	715.52
69	62		8	File Room	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	6	1.008	2096.64	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	6	0.492	1023.36	0.516	1073.28
69	63		8	Conference	3-light 2x4 recessed troffer w/ 34 watt T12 lamps	6	0.78	405.6	RLRB 3-lamp low power electronic ballast & 4' 28 watt T8 lamps	6	0.378	196.56	0.402	209.04
69	64		8	Superintendent	3-light 2x4 recessed troffer w/ 34 watt T12 lamps	4	0.52	1081.6	RLRB 3-lamp low power electronic ballast & 4' 28 watt T8 lamps	4	0.252	524.16	0.268	557.44
69	65		8	Secretary	3-light 2x4 recessed troffer w/ 34 watt T12 lamps	6	0.78	1622.4	RLRB 3-lamp low power electronic ballast & 4' 28 watt T8 lamps	6	0.378	786.24	0.402	836.16

Lighting Survey Data

Bldgid	Line #	Floor	CeilHt	Room Description	Existing Description	EQty	EKW	EkWh	Proposed Description	PQty	PKW	PkWh	KWSaved	kWhSaved
69	66		8	Inspection	3-light 2x4 recessed troffer w/ 34 watt T12 lamps	2	0.26	540.8	RLRB 3-lamp low power electronic ballast & 4' 28 watt T8 lamps	2	0.126	262.08	0.134	278.72
69	67		8	Hallway	3-light 2x4 recessed troffer w/ 34 watt T12 lamps	6	0.78	1946.88	RLRB 3-lamp low power electronic ballast & 4' 28 watt T8 lamps	6	0.378	943.488	0.402	1003.392
69	68		8	Foreman's Office	3-light 4' industrial w/ 34 watt T12 lamps	4	0.52	1081.6	RLRB 3-lamp low power electronic ballast & 4' 28 watt T8 lamps	4	0.252	524.16	0.268	557.44
69	69		8	Lunchroom	3-light 2x4 recessed troffer w/ 34 watt T12 lamps	6	0.78	1216.8	RLRB 3-lamp low power electronic ballast & 4' 28 watt T8 lamps	6	0.378	589.68	0.402	627.12
69	70		8	Mechanics	3-light 2x4 recessed troffer w/ 34 watt T12 lamps	2	0.26	757.12	RLRB 3-lamp low power electronic ballast & 4' 28 watt T8 lamps	2	0.126	366.912	0.134	390.208
69	71		8	Locker Room	2-light wrap w/ 34 watt T12 lamps	4	0.336	1956.864	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	4	0.168	978.432	0.168	978.432
69	72		8	Womens Restroom	2-light wrap w/ 34 watt T12 lamps	1	0.084	209.664	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	1	0.042	104.832	0.042	104.832
69	73		8	Mens Restroom	2-light wrap w/ 34 watt T12 lamps	3	0.252	628.992	RLRB 2-lamp low power electronic ballast & 4' 28 watt T8 lamps	3	0.126	314.496	0.126	314.496
69	74		8	Traffic Control	4-light 2x4 recessed troffer w/ 34 watt T12 lamps	10	1.68	3494.4	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	10	0.82	1705.6	0.86	1788.8
69	75		8	Storage for workroom	2-light 8' industrial w/ 60 watt T12 lamps	4	0.572	208.208	RLRB 2-lamp standard power electronic ballast & 8' 54 watt T8 lamps	4	0.34	123.76	0.232	84.448
69	76		8	Garage	2-light 8' industrial w/ 60 watt T12 lamps	1	0.143	416.416	RLRB 2-lamp standard power electronic ballast & 8' 54 watt T8 lamps	1	0.085	247.52	0.058	168.896
69	77		8	Storage	4-light 4' industrial w/ 34 watt T12 lamps	1	0.168	61.152	RLRB 4-lamp low power electronic ballast & 4' 28 watt T8 lamps	1	0.082	29.848	0.086	31.304