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1 Energy Conservation Measures

1.1 Energy Conservation Measure Summary

McClure Company has investigated each of the Core Energy Conservation Measures found in the RFP Appendix L ‘Core Energy Conservation Measures’ section. McClure has either calculated the energy conservation measure into the project scope or has set forth a detailed justification for the exclusion of the energy conservation measure (ECM) as described below. The calculations for each energy conservation measure can be found in ‘ATTACHMENT 1 – ENERGY CALCULATIONS’.

Category	Energy Conservation Measure	Calculated in Scope?
Electrical Measure	Facility Lighting Fixture Conversion to LED	Yes
Electrical Measure	Lighting Sensors	No
Facility Thermal Building Systems	Energy Management System Implementation & Upgrades	No
Facility Thermal Building Systems	High-Efficiency Dual Fired Oil/Gas Burners Conversion	Yes
Building Envelope	Weatherization and Sealing of Building Envelope	No
Water Conservation	Low Flow Faucet Aerators, Flush Valves and Faucets	No

Preliminary Energy Baselines

Baselines for this proposal are based on fiscal year 2015, (July 2015 through June 2016) as the most current fiscal year of data available at the time of this proposal. See ATTACHMENT 2 – ENERGY BASELINE for baseline usage by utility type.

1.1.1 EM-1: Facility Lighting Fixture Conversion to LED (Recommended)

Existing Conditions

As part of the 2010 GESA project, McClure Company surveyed all buildings revealing a total of 10,602 fixtures that contained a combination T-12 and T-8 fluorescent lighting, incandescent lighting and high intensity discharge mercury vapor and metal halide fixtures. Fixtures were overall in fair condition but were starting to show signs of age. It was noted during this survey that several “high bay” areas have previously been converted to T8 fixtures, however, numerous T12 and incandescent fixtures were still remaining. In general, all fluorescent fixtures were replaced with 25W lamps and instant start electronic ballasts (some fixtures were de-lamped), incandescent were replaced with compact fluorescent lamps, and exit signs with LED equivalents. Many of the high intensity discharge (HID) fixtures were retrofit to T5 fluorescent. Limited exterior lighting retrofits were included in this 2010 project.

Proposed Solution

McClure Company is proposing to retrofit the existing exterior fixtures and interior fluorescent fixtures with new LED lamps. Please refer to ATTACHMENT 3 – LIGHTING SCOPE OF WORK.

Assumptions

No corrections to existing code violations or deficiencies were found during survey; however, these system deficiencies will be brought to the attention of customer at the conclusion of the Energy Audit

Includes cost for EPA approved recycling of fluorescent and HID lamps/ballasts

New LED lamps to be direct wired to existing fixture socket

Existing fixtures are in good, serviceable condition

Fixtures will be checker-board switched following retrofit

Lighting Burn Hours are based on occupancy hours from Bulletin 3. Individual space hours within the buildings will be required during the Energy Audit

Savings / Benefits

Energy savings are calculated using wattage reductions from the manufacturer's provided specification sheets for the applicable lamp. These reductions are multiplied by the stipulated hours provided in Bulleting 3 to generate the kWh savings. The cost savings are calculated using this kWh savings multiplied by each buildings baseline electric rate.

1.1.2 EM-2: Lighting Sensors (Not Recommended)

Existing Conditions

As detailed above, McClure Company performed a lighting retrofit in 2010, during which no lighting sensors or controls were included due to payback criteria given the nearly 24 hour operation of the facility. McClure Company has re-evaluated the opportunity, targeting only select areas that would benefit from the lighting sensors.

Proposed Solution

McClure Company is not recommending lighting sensors for this project. After targeting the most advantageous locations, the return on investment falls outside the project parameters for payback. The major factor contributing to the poor payback is the operation of the facility and its nearly 24 hour operational schedule limiting the impact of lighting sensors for unoccupied periods.

1.1.3 FTBS-1: Energy Management System Implementation & Upgrades (Not Recommended)

Existing Conditions

Many of the buildings on the Selinsgrove Center's campus have been upgraded with electronic control, although not all controls communicate back into a front end graphical user interface. As part of the 2010 GESA project, McClure Company installed a direct digital control system, including a standalone fiber optic network, for increased control of the buildings.

Fiber optic network was installed from the Central Complex (Buildings 5, 6, & 7) to the Maintenance Building (Building 28) and finally ending in the Central Power Plant (Building 30). This allowed for remote viewing of the system from the Maintenance Building for the above buildings.

Other buildings on campus received localized control, allowing the systems to operate on a defined occupied/unoccupied schedule. Proper operating schedules and set backs were installed to meet the operating conditions of the buildings at the time of the project. Controls of the buildings' steam stations were also included to reduce steam use during unoccupied times. Unoccupied or Mission Ready buildings also received control upgrades to the main stream control stations to enable a building wide set back program for steam reduction during the winter. The buildings have the minimal controls necessary to maintain a setback during the winter for a mission ready status. Should the building become occupied, localized control can be enabled to allow for full steam flow and the facility to return to its terminal control devices, primarily pneumatic, for operational control.

Also, as part of the 2010 project, all new and select existing HVAC equipment for the Central Complex received controls integrated into a new front end graphical user interface. The new Honeywell boiler control system is not integrated into the building automation system at the request of the facility. The Central Complex buildings did not receive advanced scheduling as this facility is a 24/7 operation.

The final part of the 2010 GESA control upgrades included provisions to maintain summer loop steam pressure in steam piping known to experience issues with expansion/contraction due to shut down. Steam lines serving Building 17-21 and 31-35 maintain a lower pressure steam in the piping distribution network during summer operation to avoid piping issues from expansion/contraction.

Proposed Solution

McClure Company is not recommending any new implementation of controls or upgrades to the existing system, as there is minimal energy savings associated with the upgrade resulting in poor payback outside the project parameters. Given the localized control already present in the facilities, the opportunity to gain any additional savings from implementing a new system is minimal.

1.1.4 FTBS-2: High-Efficiency Dual Fired Oil/Gas Burners Conversion (Recommended)

Existing Conditions

The boiler plant for the Selinsgrove Center was built in 1937 as a coal burning, high pressure steam plant, currently housing (2) 610 BHP boilers installed in 1947 and (1) 513 BHP boiler installed in the 1950's. The boiler plant also houses all steam ancillary equipment. Located behind the existing building are a flue gas recirculation (FGR) system and a bag house/core separator system. While currently not operating, the FGR system is an integral part of the boiler plant and should be operating when using the coal boilers.

As part of a previous GESA project in 2010, McClure Company constructed an addition to the existing brick building to house a new boiler sized for the facilities summer load. The boiler is a 350 BHP, natural gas fired, high pressure steam boiler. The new building also houses a high pressure steam turbine.

The current boiler plant utilizes the gas fired boiler during the summer and the shoulder months, with the 513 BHP coal boilers on line as backup. Steam pressure generated during the summer is 65 PSI, which is equal to the pressure delivery requirements of the facility. During the winter, the 610 BHP coal boilers are brought on line and operate in a duty/standby arrangement. A steam pressure of 180 PSI is generated to maintain proper firing. This higher pressure steam is used to operate the steam turbine, reducing steam to 65 PSI, which is then distributed to the facility. A pressure reducing station is located in the new building should the turbine be off line for any reason.

The coal fired boilers are presently controlled by industrial level Honeywell controls. The complexity of the coal fired operation and the experience of Honeywell's industrial division for such systems led to their selection for the 2010 GESA project. However, given the inherent difficulties in modernizing controls on a 60+ year old system and the complexity of coal fired boilers, the system has been operational, but difficult to maintain.

The coal boilers and associated infrastructure date largely from the 1950's and, at 60 years old, are far past their useful life. By modern standards, it is inefficient and labor intensive to operate. Additionally, because of the age of the plant, many components are constructed of, or contain hazardous materials including asbestos and lead paint. This potentially exposes workers to these materials and makes maintenance and upgrades complicated and expensive. The plant does not have the operational equipment and systems required to meet the current EPA air emissions standards.

Proposed Solution

McClure Company is proposing to retrofit two of the existing coal fired boilers to operate with dual fuel capabilities (natural gas and fuel oil), including the necessary flue gas recirculation (FGR) system, properly sized variable speed forced draft and induced draft fans, and elimination of the complex exhaust routing through the outdoor, abandoned equipment. The third boiler will be abandoned in place.

New, front mounted, dual fuel burners will be installed above the existing coal grate system on a service platform that also houses the forced draft fan. The existing coal chute and hopper on the front of the boilers will be removed, as well as the existing operator platform. The existing mobile coal trolley system will be abandoned in place. The service platform will be tied to the existing catwalk platform with a direct access from the boiler room floor. The existing wind box will be sealed using fire brick and refractory in order to create a new boiler throat.

Natural gas and oil will be supplied to the burners via new skid mounted fuel trains located adjacent to each boiler. The required natural gas pressure is 20 PSIG to the trains with 10 PSIG at the burners. New natural gas piping will be extended from the burners to the gas train skid and from the skid to the natural gas meter (meter by others). New fuel oil piping will also be extended to new fuel oil pumps and day tanks (one for each boiler), with piping to a new 12,000 gallon tank located near the existing coal storage pile. The fuel oil will be atomized via the existing compressed air service in the central plant.

New forced draft and induced draft fans will also be provided, both with variable speed capabilities in order to balance boiler draft for optimal conditions with the new burners and to avoid pressurizing the boiler fire box creating an unsafe environment.

The existing exhaust system within the boiler plant will be removed along the rear wall. New exhaust duct work will be routed to the new induced draft fans and then directly to the stack. The FGR system will be installed on the boiler exhaust

ducts and routed to the front service platform where the forced draft fan is located. The existing FGR and bag house will be abandoned in place.

As the firing of the boilers is switched from coal to natural gas/fuel oil, the control system becomes less complicated and requires less industrial level, customized control. The control of each boiler will include a local control panel replacing the Honeywell boiler controllers. The new control panel will include Fireye BurnerLogix for combustion control and an Allen-Bradley PLC system for overall burner control. Each boiler controller will also have a touch screen for direct operator interface.

The Honeywell master controller will also be replaced, effectively removing Honeywell control from the boiler plant. The new master controller will also include Allen-Bradley PLC controls matching the boiler controls. The control logic in the master controller will include all functions currently performed by the Honeywell master controller. The master controller will also have touch screen for direct operator interface.

The new Allen-Bradley PLC system is less complicated, given the new burner types, and is not as proprietary in nature. There are multiple companies with experience in Allen-Bradley PLC control and with experience in boiler control using Allen-Bradley PLC controls, allowing Selinsgrove Center choices not currently available when choosing a service provider.

Hazardous waste removal is included for the removal of the existing exhaust ductwork, modifications to the existing catwalk/service platforms, cutting of existing refractory and brickwork for burner installation, and for relocation of select service lines located in the front of the boilers. Other materials not requiring modifications in order for installation will be not be disturbed as part of the project.

Assumptions

- The remaining coal in the bunker behind the boiler addition shall be removed by the Owner prior to the installation of the 12,000 gallon fuel oil tank.
- The existing compressed air system can be retained and used to serve the new equipment.
- All existing boilers, equipment, piping, etc. will be abandoned in place except as needed for the installation of the new work proposed above.

Savings / Benefits

Energy savings are calculated using the increased efficiency of the burners over the existing coal system, along with the cost reduction in materials for maintaining coal boiler operation.

1.1.5 BE-1: Weatherization and Sealing of Building Envelope (Not Recommended)

Existing Conditions

All the occupied and mission ready facilities were surveyed for areas of infiltration that would result in unnecessary load for the mechanical system. Infiltration can be defined as unregulated outside air entering a building unintentionally. This air must be treated (heated or cooled) by the building's heating or cooling system to maintain acceptable indoor temperatures.

Proposed Solution

McClure Company is not recommending weatherization and sealing of building envelope for this project. After targeting the most advantageous locations, the return on investment falls outside the project parameters for payback.

1.1.6 WC-1: Water Conservation (Not Recommended)

Existing Conditions

The survey for water conservation largely targeted the Central Complex, as it is the most heavily used and occupied facility. Approximately 180 fixtures were evaluated with 79 requiring no retrofit given the existing fixture or use. While water is billed as a separate utility and based on usage, the sewer is a flat rate quarterly bill, which when evaluated as a unit cost using the facility's water usage, is on the low end of the expected cost range for similar facilities. This data

indicates that if the facility would switch to a unit cost structure similar to the water service, the overall utility spend would increase.

Proposed Solution

Given our preliminary investigation, the low water rate creates a less than desirable payback for the program. The sewer rate was not included, as the facility is currently on a fixed rate fee described above.

While detailed surveys were performed in select locations on campus, the existing water utility rate and fixed sewer utility rate do not provide adequate savings to justify a water conservation project.

McClure Company is not recommending this measure due to its extended payback. Given the fixed cost sewer utility rate, there is no incentive from that utility to lower usage for conservation savings, limiting any savings to the water utility only. Furthermore, when evaluated as a unit cost (total sewer cost/total water usage), the resulting sewer rate is relatively low when compared with similar facilities and their utility rate cost. Given the supplied information on the water and sewer rates, it is not recommended to perform the water conservation upgrades.

1.2 Energy Conservation Measure Preliminary Assessment Cost & Savings

McClure Company has provided a preliminary assessment for each energy conservation measure (ECM) opportunity, including a detailed estimate of implementation costs and energy cost savings. Detailed calculations for the energy cost savings can be found in the Attachment 1. The preliminary assessment of the energy efficiency opportunities available at the Selinsgrove Center is based upon the information provided in the RFP and a tour of the facility.

Below is a general list of assumptions for this RFP followed by the preliminary assessment, Table 2, of each of the energy conservation measures:

- Full access, escorts and parking to be provided by owner
- Existing steam distribution systems are in good condition and are adequately sized to supply heating to the campus
- Existing electrical systems are in good condition and are adequate for new equipment and interconnection
- Existing structure and load bearing capability are adequate
- Existing controls, valves, dampers, safeties and wiring, if reused, are assumed to be functional
- Design, submittal review and approval, and construction shall occur within two (2) years from notice to proceed



Table 2- Proposed Energy Conservation Measures Cost and Savings

ECM Type	ECM ID	ECM Description	Total Cost	Electric (kWh/yr)	Electric (\$/yr)	Natural Gas (CCF/yr)	Natural Gas (\$/yr)	Coal (Ton/yr)	Coal (\$/yr)	Water (kgal/yr)	Water (\$/yr)	Total Cost Savings*
Recommended ECMs	EM-1	Facility Lighting Fixture Conversion to LED	\$639,312	723,426	\$63,053							\$ 63,053
		High-Efficiency Dual Fired Oil/Gas Burners Conversion	\$3,716,332			(757,229)	(\$333,837)	4,140	\$498,572			\$ 164,735
		Subtotal	\$4,355,644	723,426	\$63,053	-757,229	-\$333,837	4,140	\$498,572	-	\$ -	-\$227,788
ECMs Not Recommended	EM-2	Lighting Sensors	\$6,137	15,129	\$1,321							\$ 1,321
	FTBS-1	Energy Management System Upgrades	\$94,294			11,668	\$6,486					\$ 6,486
	BE-1	Weatherization and Sealing of Building Envelope	\$274,688	1,850	\$162	27,011	\$15,015					\$ 15,177
	WC-1	Water Conservation Low Flow Fixtures, Valves, and Faucets	\$352,326							6,665	\$15,507	\$15,507

*Total cost savings are energy related only and do not include the capital cost avoidance for temporary boiler rental, operational and maintenance savings associated with coal boiler operation and lighting warranty, or utility related rebates. For detailed cash analysis, see Table 7.

1.3 Technical Feasibility, Suitability, Reasonableness, Comprehensiveness and Acceptability of the Proposed ECMs

McClure has thoroughly described below the technical feasibility, suitability, reasonableness, comprehensiveness and acceptability of the proposed Energy Conservation Measures (ECMs), including the proposed equipment and level of quality of the equipment for the proposed ECMs. McClure has completed a rigorous evaluation of each energy conservation measures (ECMs) included in this proposal and has proposed options for the Commonwealth to consider based on multiple criterion.

The *technical feasibility* of the ECMs proposed was taken from McClure's vast energy project experience on past projects, both at the Selinsgrove Center and across the Commonwealth. Many of the ECMs proposed for this phase were designed specifically for immediate care facilities, specifically the boiler burner replacement, where fuel supply redundancy is a code requirement. The lighting system scope was also customized for an immediate care facility, to ensure light levels met code requirements and industry standard best practices. While the systems proposed were created with the Selinsgrove specifically in mind, these system types have been instituted across other McClure projects. With the knowledge of design, implementation, and post construction monitoring of these systems, McClure's expertise and comfort with these systems will ensure a successful final product for the Selinsgrove Center.

The *suitability* of the ECMs proposed shall be confirmed during the Energy Audit phase of the project. A kickoff meeting, interim meeting(s) and final meeting will ensure the ECMs proposed are suitable for the Commonwealth and Selinsgrove Center staff's goals, needs, and future facility requirements. For each ECM, the following review criteria will be utilized to ensure each ECM is suitable for the Selinsgrove Center:

- Goals Achieved and Suitability of ECM Implementation
- Energy, Maintenance and Operational Saving Potential of ECM
- Cost-Effectiveness and Life Cycle Cost of ECM
- Condition of Existing Conditions and Installation Replacement Plan Surrounding the ECM
- Construction Plan and Considerations of ECM
- Post construction commissioning and measurement & verification of energy savings of ECM
- Personnel Training, Maintaining, and Support for Operation and Maintenance of ECM

The *reasonableness* of the ECMs proposed will be identified, quantified and communicated to the project team through a variety of metrics. These metrics will ensure optimization of the ECM at each level, from each ECM unit to the full ECM system. This protocol is essential to ensuring the ECMs proposed not only meet the goals of Selinsgrove Center and the Commonwealth, but are reasonable and make implementation sense from multiple metric aspects. These reasonableness metrics include, but are not limited to:

- simple payback
- life cycle cost
- net present value
- energy savings potential
- operational and maintenance savings
- labor reallocation opportunities
- government and utility incentives available
- overall cost to build and maintain

The *comprehensiveness* of the ECMs proposed starts with the Energy Audit. McClure understands that the scope of each ECM shall not be applied without careful monitoring, understanding and dissecting of each ECM system in place. A blanket solution is not always viable or does not make financial, economical or physical sense. McClure's approach to ECM identification and scope determination is comprehensive, time intensive, and extensive. Not only is every ECM system reviewed, but each system component is carefully analyzed, measured, metered and/or evaluated for reasonableness, suitability and technical feasibility. This upfront qualification ensures a fully customized product of our Energy Audit, in addition to multiple ECM options presented to the Commonwealth and Selinsgrove Center for review. An additional bi-product of this multiple tier investigation approach is a granular, unit level understanding of each ECM

system, which allows for better design, implementation and scheduling techniques to be communicated and employed by the project team. Below is a summary of the comprehensive approach McClure will take for each of the ECMs identified:

ECM	Comprehensiveness of Design for Proposed ECM
EM-1: Facility Lighting LED Conversion	Each fixture will be evaluated and designed for cost effectiveness with consideration of design characteristics including light level, efficacy, efficiency, task luminance, quality, flexibility, day light integration, glare, controllability, light trespass, and illumination.
FTBS-2: Burner Retrofit	For the design of the new boiler burners, the following design characteristics will be evaluated: system and equipment design integration, system dependability, operability, working efficiency, cost of operation, facility load factors, and future system serviceability.

The *acceptability* of the ECMs proposed is an important step for a successful project. A kickoff meeting, interim meeting(s) and final meeting will ensure the ECMs proposed are suitable for the Commonwealth and Selinsgrove Center staff's goals, needs, and future facility requirements. In addition, McClure will meet the following project compliance requirements of the Commonwealth:

- Lead Paint, Asbestos and Hazardous Materials compliance and action plan upon project award
- Insurance, Performance Bond, Payment Bond, Engineering Services and Post Construction Services compliance and plan upon project award
- Energy Audit (EA) report upon project award
- PA State Acts, including but not limited to, Coal Act, Steel Product Procurement Act, Public Works Employment Verification Act, and PA Prevailing Wage Act

The *proposed equipment* for the proposed ECMs can be found in the table below.

ECM	Proposed Equipment
EM-1: Facility Lighting LED Conversion	<ul style="list-style-type: none"> • Direct Drive/Wire T8 LED Lamp for 1x3/1x4/2X2/2X4 fixtures • LED A21 Lamps to replace incandescent A-lamp fixtures • LED Flood fixture to replace metal halide flood fixtures • LED A19 lamps to replace canopy and other compact fluorescent fixtures • LED Plug-In Lamps to replace compact fluorescent canopy, down light, wall pack, drum, jelly jar and sconce fixtures. • LED Post Top fixture to replace high pressure sodium post tops • LED dusk to dawn barnyard fixture to replace Metal Halide fixtures • LED Omni-cob lamp fixture to replace square down light incandescent fixture • LED BR20/30/40 and Candelabra lamps to replace down light and candelabra fixtures • LED High Bay Fixtures to replace fluorescent high bay fixtures
FTBS-2: Boiler Replacement	<ul style="list-style-type: none"> • Dual Fuel Burners with Special Class 3 Direct Spark Ignitor and windbox • New Force Draft (FD) fan • New Induced Draft (ID) Fan • Boiler Controls (UL/NFPA 85 compliant) • Natural Gas Fuel Train (NFPA 85 compliant) • No 2. Oil Train (NFPA 31 & 85 compliant) • Atomizing Air Train (NFPA 31 & 85 compliant) • FGR duct • New Instruments and Devices, including water column with Level Probes: High Water Alarm, Low Water, Alarm, Low Water Cut-off, Aux Low Water Cut Off Float Switch, Water Column blow down bypass switch, Purge Airflow Differential Pressure Switch, Steam high pressure cut off switch, Steam excessive high pressure cut off switch, High Furnace Pressure Cut-off Switch, Low Instrument Air Pressure Switch, FGR damper and actuator, and ID damper and actuator.

The level of quality of the equipment for the proposed ECMs is medium to high quality. The equipment proposed has been installed on similar energy saving projects. References can be made available by request and site visits can be coordinated for the Commonwealth, in order to see other local installations. The equipment has warranties and has been tested and is in compliance with industry standards.

1.4 Additional Energy Conservation Measures (ECMs)

McClure Company is not recommending any additional ECM's at this time.

2 Energy Audit

2.1 Energy Audit Scope

McClure Company has provided below a clear and thorough description of the scope of the Energy Audit, including systems covered, personnel, methodology, and schedule milestones.

McClure Company’s systematic approach to a guaranteed energy saving project is divided into three major phases:

1. Scoping Audit Phase / RFP: McClure will conduct an initial feasibility study. The study includes, but not limited to, a review of the utility bills, site surveys, interview of major stakeholders and personnel, preliminary energy conservation cost / savings estimates, and financial models. This RFP Response is the result of the scoping audit phase.
2. Energy Audit (EA)/ Investment Grade Audit Phase: The Energy Audit is a detailed study of the energy conservation measures identified. Detailed in the sections below, McClure Company will perform an Energy Audit in accordance with the RFP and timeline schedule requirements.
3. Final Scope Selection & Design Phase: McClure Company will complete the final engineering and design phase coordination with DGS’ Bureau of Engineering & Architecture (E/A).

The *systems covered* during the Energy Audit (EA) based on this RFP response include:

System Covered	Energy Audit (EA) Process Overview
EM-1: Facility Lighting Fixture Conversion to LED	<ul style="list-style-type: none"> • Audit fixture counts, foot-candle measurements, voltage, wattage and fixture/ballast equipment types • Record operation and maintenance items and hours of occupancy per space • Select new fixtures based upon facility goals, feedback, and cost effectiveness
TBS-2: High-Efficiency Dual Fired Oil/Gas Burners Conversion	<ul style="list-style-type: none"> • Audit existing equipment and systems for location, nameplate data, etc. • Identify demolition and new construction scope around existing infrastructure • Coordinate with UGI to define scope, meter placement, schedule, etc.

The *personnel* for the Energy Audit will be primarily managed by Chris Stultz (Project Development Manager), with support from Scot Carabini (Professional Lighting Designer), and William Smith (Building Automation System Engineer) for lighting and building automation related measures, along with Brian Moore (Engineering Manager) for any boiler-related items. Richard Skinner (M&V) will begin the commissioning plan in this phase as well. The team will still be ultimately overseen by Shayne Homan (Director of Energy Services) and Alyssa Wingenfield (Account Executive).

The *methodology* for the Energy Audit (EA) includes, but not limited to:

- Kickoff meeting to review the RFP Response with the Commonwealth and Selinsgrove Center
- Analysis of utility bills, past Measurement and Verification studies and overall facility benchmarking
- Select Energy Conservation Measures (ECMs) that meet the needs and goals of Selinsgrove Center Collection of general information for each building on campus (square footage, floors, hours, etc.)
- Site surveys to audit and inspect buildings on campus, focusing on the major ECMs
- Understanding of operating characteristics for lighting and boilers, analyze energy consumption of equipment and systems.
- Perform energy calculations, methodology, assumptions along with rebates / incentive calculations
- Identify any additional cost saving opportunities that may have a cost effective impact to the program
- Iterative review with the Commonwealth and Selinsgrove Center to show progress and ensure goals are met
- Perform simple payback and life cycle cost analysis on each ECM and the associated equipment
- Develop a commissioning and M&V plan for proposed ECMs
- Internal design peer reviews, estimating reviews, and 360° risk reviews completed by the project team
- Provide definitive cost and savings estimates for proposed final energy conservation measures (ECMs)
- Complete a final project cash flow with revised cost/savings for each ECM identified
- Final review with the Commonwealth and Selinsgrove Center

Below are *schedule milestones* for the Energy Audit (EA):

Milestone	Timeline
Kick-off Meeting upon Selection	April 2017
Project Development and Final Design	May 2017-October 2017
Completion of Energy Audit	July 2017
Design Review and DGS Approval	July 2017-September 2017
Major Equipment Procurement	October 2017-May 2018
Mobilization & Kick-off	October 2017

2.2 Energy Audit Compliance with DGS' Energy Audit Format

McClure's approach to the Energy Audit will comply with DGS' Energy Audit format. For the energy audit, McClure's approach will closely follow the 'Small GESA Project Design Manual', 2014 Edition, which was found in Appendix J of the RFP. Chapter 2 summarized the framework for energy audit activities. McClure shall visit the site during the project-specific RFP process and as needed during the investigation and preparation of the Energy Audit Report. McClure will verify the existing conditions during these visits. McClure will leverage internal drawings and documentation from the 2010 Selinsgrove Center project. Variances will be avoided unless absolutely necessary and the project design and construction will conform to PA's Uniform Construction Code (ICC) adopted under Act No. 45 of 1999. McClure will complete the required site investigations for above ground fuel oil tanks, which will be located on a concrete pad. Steel procurement will comply with the Steel Products Procurement Act.

For the proposal, McClure will include information on the systems that will be covered, the personnel to be involved, the general method to be used and the time frame for the completion of each item. The proposal will detail the methodology for the calculation of the baseline and show the utility usage data that was provided in the RFP Appendix and Bulletins. The proposal will also describe, in detail, the method used to compute the energy baseline and the timeline to commence and complete the audit.

2.3 Reasonable and Transparent Approach to Energy Audit Pricing

McClure has a *reasonable approach* to Energy Audit pricing. McClure is committed to completing all engineering and administrative tasks required to produce a comprehensive energy audit report in expeditious manner and in accordance with this project specific RFP and relative sections in the PA DGS Small GESA Project Design Manual. Utilizing this information, McClure is able to develop a fee by estimating engineering, administrative and sub-consultant fees required for a comprehensive analysis of the recommended energy conservation measures (ECMs). Our professional engineering and administrative rates are listed below and in accordance with our rates previously submitted and approved through the Small GESA process. Table 3 below shows the engineering and administrative rates.

McClure has a *transparent approach* to pricing. Subcontractor quotes, supplier quotes, management labor fees, and other project related costs and fees can be shared with the Commonwealth in an open book arrangement for both the Energy Audit phase and the Construction phase. For the Energy Audit, McClure self performs the majority of the auditing activities in house. McClure will rely on subcontractors and retained professionals to provide additional auditing capabilities for specialized systems outside McClure's expertise, such as specialized burner installations, lighting retrofit design, and electrical engineering. Auditing activities McClure can provide include mechanical design engineering, energy calculations, project development, construction management, commissioning and measurement and verification. The rates are in line with McClure's AFQ submission on August 7, 2014.

Table 3 – Engineering and Administrative Rates

Description/Title	Hourly Rate
Senior Level Manager	\$130
Project Developer, P.E., CEM	\$100
Sr. Energy Manager, P.E. CEM	\$110
Jr. Energy Engineer	\$85



Sr. Construction Manager	\$95
Jr. Construction Manager	\$75
Account Executive	\$65
Administrative Support	\$45

3 Costs

3.1 Sound Engineering Principles and Reasonableness of Proposed Savings

McClure has proposed an energy analysis, at a high degree, that demonstrates sound engineering principles and reasonable proposed savings. The detailed energy analysis can be found in Attachment 1 – Energy Calculations, located at the end of Volume II.

Sound engineering principles were utilized to analyze the energy savings associated with the Selinsgrove Center project. One internal process utilized by McClure is to compare cost reduction to typical, comparable past GESA project comparison. McClure’s proposed cost savings for the Selinsgrove Center reduces the baseline annual utility expenses by \$227,788. This project focuses on more capital intensive equipment with a lower return on energy savings. When evaluated with the 2010 GESA (results shown in the table 4 below), the holistic effect of the energy savings can be seen. The total reduction for both projects fall into typical GESA project costs savings range of 20%-40%. Energy savings beyond 40% are indicative of capital intensive upgrades with diminishing returns on energy savings. Below is a table that summarizes the percentage of energy savings by utility.

Table 4 – Sound Energy Principles: Annual Energy Use and Savings Summary

Utility	Baseline		Post-Project		Annual Savings*		% Energy Savings \$
	Unit	\$	Unit	\$	Unit	Unit	
Electric	6,044,560 kWh	\$521,617	5,321,134 kWh	\$458,564	723,426 kWh	\$63,053	12%
Natural Gas	296,780 CCF	\$129,545	1,054,009 CCF	\$463,382	(757,229 CCF)	(\$333,837)	8%
Coal	4,140 Tons	\$498,572	0 Tons	\$0	4,140 Tons	\$498,572	
Subtotal		\$1,149,734		\$921,946	Subtotal	\$227,788	20%
2010 GESA Savings		\$1,380,528		\$1,085,939	2010 GESA Savings	\$294,589	21%
Total Savings: (\$227,788 + \$294,589) / \$1,380,528 =							38%
Sound Engineering Principles: Typical GESA Project % Energy Savings Range							20%-40%

*Rates have been escalated by 1% to account for construction year

The reasonableness of the proposed savings is evident by further examining the energy conservation measures selected for this project. The methodology for calculating savings follows fundamental engineering principles and balances the energy savings against the baseline. Below is a table summarizing the savings in comparison to a range on similar projects. This data indicates the associated cost savings are in a high degree of reasonableness.

Table 5 – Reasonableness of Proposed Savings: ECM Cost Savings Summary

ECM	Electric Savings	Fuel Savings	Total Savings	% of Total Energy Savings	Reasonableness of Proposed Savings: Typical Project Savings Range by ECM
Lighting, EM-1	\$63,053	\$0	\$63,053	27.7%	10% - 30%
Mechanical, TBS-2	\$0	\$164,735	\$164,735	72.3%	70% - 90%
Subtotal	\$63,053	\$164,735	\$227,788		

3.2 Reasonable Cost for Preparing the Energy Audit

McClure has established a reasonable cost for preparing and Energy Audit for this scope of work in compliance with the methodology discussed in this Cost Submission. In addition, McClure plans to thoroughly discuss and support the costs in this section during an interview, if required.

Based on the scope of the Selinsgrove Center, coupled with our experience on the 2010 project, McClure has estimated the cost to complete an Energy Audit Report. McClure estimates the audit will take approximately 45 days to complete. Table 6 contains the estimate developed to complete the Energy Audit Report in compliance with this RFP and correlating Core ECMs, including the lighting and HVAC burner upgrades.

Table 6 – Energy Audit Report Cost Breakdown – Core ECMs

ID	TASK	PRIMARY PERSONNEL	COST
1	Iterative Meetings with DGS	Team	\$1,600
2	Lighting Engineering Surveys	Lighting Engineer Lighting Designer	\$6,800
3	Lighting Technical Engineering	Lighting Engineer Lighting Designer	\$8,000
4	Lighting Energy Engineering	Lighting Engineer Lighting Designer	\$4,000
5	Lighting Design Documentation	Lighting Engineer Lighting Designer	\$1,200
6	Lighting Administrative	Administrator	\$520
7	HVAC Overall System Surveys	Mechanical Engineer Energy Engineer	\$11,500
8	HVAC Control System Surveys	Mechanical Engineer Energy Engineer	\$2,400 \$2,400
9	Field Measurements	Technician	\$3,000
10	Meter Deployment & Retrieval	Technician	\$6,000
11	HVAC Control System Engineering	Mechanical Engineer Energy Engineer	\$4,500
12	HVAC System Energy Engineering	Energy Engineer	\$6,000
13	Commissioning Plan Development	Commissioning Manager	\$1,200
14	M&V Plan Development	M&V Manager	\$1,200
15	McClure Internal Planning	Team	\$2,080
16	Project Execution Planning	Project Manager	\$1,040
17	Overall Administrative	Administrator	\$1,560
	Energy Audit Report Fee		\$65,000

3.3 Annual Financial Projections

McClure has provided an annual financial projection for the length of the contract and each projection appears in the proper format listed in the RFP, as described below. McClure has provided the annual financial projections for 15 year length of the GESA Contract, which can be found in *Table 7 - Annual Financial Projections for the GESA Contract*, located at the end of this section.

Based on our preliminary analysis, in addition to information provided in the RFP and Bulletins, McClure has identified the preliminary project financial summary listed below.

EM-1 Cost	\$639,312
FTBS-2 Cost	\$3,716,332
Total Project Cost	\$4,355,644
Total Year 1 Energy Savings:	\$227,788
Act 129 Rebates	\$32,892

Table 7 - Annual Financial Projections for the GESA Contract provides the summary of the costs, savings, and simple payback for the core energy conservation measures outlined in the RFP. Each measure is listed separately to show the individual energy and cost impact. All savings shown on this table are guaranteed. McClure Company’s overall assumptions applicable to *ECM Cost and Savings Summary* include:

- Annual Financial Projections are based upon the recommended Core ECMs only
- Construction period savings are based on 50% of the Year 1 Guaranteed Savings. This value will be adjusted upon confirmation of a defined project schedule.
- Financing payments are based on an annual interest rate of 3%. Issuance costs have not been included in the financial model.
- Financing payments have been shown at the minimum amount of whole years, which result in a positive net savings. Upon selection of the final scope of work and financing mechanism, this structure can be modified accordingly.
- Capitalized Interest cost has been estimated based on a 12 month construction period. This value will be adjusted upon confirmation of a defined project schedule.
- M&V fee has been escalated at 1% per year.
- Act 129 Rebates are assumed to be deferred to the ESCO in order to reduce the overall project cost.

Detailed energy and cost calculations can be found in Attachment A. For purposes of developing this proposal and the many assumed variables at this point, we have de-rated the calculated savings for an added level of conservatism. When the Energy Audit (EA) is conducted, many variables will be measured and verified and the savings will be adjusted accordingly.



Table 7: Annual Financial Projections for GESA Contract

Project Cost	\$4,355,644	Interest Rate	3%
Act 129 Rebate	\$32,892	Discount Rate	3%
Net Project Cost to be Financed	\$4,322,752	Energy Cost Escalation Rate	1%
First Year Energy Savings	\$227,788		
First Year Operational Savings	\$155,877		

Year	A	B	C	D	E	F	G	H	I	J
	Annual Energy Costs without Improvements	Annual Energy Costs with Improvements	Annual Energy Cost Savings (A-B)	Annual Maintenance Cost Savings	Capital Cost Avoidance	Payments for Financing Equipment	Payments for Monitoring and Maintenance Services	Net Annual Benefit (C+D+E-F-G)	Cumulative Cash Flow	Net Present Cash Flow
Const	\$1,244,381	\$1,131,615	\$112,766		\$0	\$0	\$0	\$112,766	\$112,766	\$109,482
1	\$1,256,825	\$1,029,037	\$227,788	\$155,877	\$120,000	\$442,376	\$25,000	\$36,290	\$149,056	\$144,714
2	\$1,269,393	\$1,039,327	\$230,066	\$122,985	\$120,000	\$442,376	\$25,750	\$4,925	\$153,981	\$149,496
3	\$1,282,087	\$1,049,721	\$232,366	\$122,985	\$120,000	\$442,376	\$26,523	\$6,454	\$160,435	\$155,762
4	\$1,294,908	\$1,060,218	\$234,690	\$121,616	\$120,000	\$442,376	\$0	\$33,930	\$194,365	\$188,704
5	\$1,307,857	\$1,070,820	\$237,037	\$121,616	\$120,000	\$442,376	\$0	\$36,277	\$230,643	\$223,925
6	\$1,320,936	\$1,081,528	\$239,407	\$121,616	\$0	\$357,376	\$0	\$3,648	\$234,290	\$227,466
7	\$1,334,145	\$1,092,344	\$241,801	\$121,616	\$0	\$357,376	\$0	\$6,042	\$240,332	\$233,332
8	\$1,347,486	\$1,103,267	\$244,219	\$121,616	\$0	\$357,376	\$0	\$8,460	\$248,792	\$241,545
9	\$1,360,961	\$1,114,300	\$246,662	\$121,616	\$0	\$357,376	\$0	\$10,902	\$259,694	\$252,130
10	\$1,374,571	\$1,125,443	\$249,128	\$121,616	\$0	\$357,376	\$0	\$13,369	\$273,062	\$265,109
11	\$1,388,316	\$1,136,697	\$251,619	\$116,000	\$0	\$332,376	\$0	\$35,244	\$308,306	\$299,326
12	\$1,402,200	\$1,148,064	\$254,136	\$116,000	\$0	\$332,376	\$0	\$37,760	\$346,066	\$335,986
13	\$1,416,222	\$1,159,545	\$256,677	\$116,000	\$0	\$332,376	\$0	\$40,301	\$386,367	\$375,114
14	\$1,430,384	\$1,171,140	\$259,244	\$116,000	\$0	\$332,376	\$0	\$42,868	\$429,236	\$416,734
15	\$1,444,688	\$1,182,852	\$261,836	\$116,000	\$0	\$224,484	\$0	\$120,461	\$549,696	\$533,686
	\$21,475,359	\$17,695,917	\$3,779,442	\$1,833,160	\$600,000	\$5,552,742	\$30,301	\$549,696		

4 Measurement and Verification

4.1 Measurement & Verification Plan Adherence to Standards and Scalability

McClure, to a high degree, has proposed a measurement and verification plan that adheres to all M&V protocol standards and demonstrates scalability for measurement and verification of the proposed energy baseline, adjustment factors and energy cost savings as described below.

The M&V Plan Adheres to All M&V Protocol Standards. Listed below are the procedures and guidelines for quantifying savings resulting from the installation of ECMs under energy performance contracts and is intended to comply with the International Performance Measurement & Verification Protocol (IPMVP) and/or the Federal Energy Management Program (FEMP). Below are the four M&V options considered for energy conservation measures:

- **Option A – Partially Measured Retrofit Isolation**
 Key performance factors (lighting wattage or chiller efficiency) are determined with spot or short-term measurements and operational factors (lighting hours of operation or cooling ton-hours) are stipulated based on analysis of historical data or spot/short term measurements. The savings are determined using spot or short-term measurements, which would occur in both the pre and post retrofit installation periods. An example of the measurements will be measuring the wattage use of fixed number of samples of lighting fixtures both before and after the lighting retro-fit. In the lighting retro fit example the light burn hours are mutually agreed upon variable.
- **Option B – Retrofit Isolation**
 The energy savings are determined by field measurement of the energy use of the systems to which the ECM was applied separate from the energy use of the rest of the facility. Short-term, long-term or continuous measurements are taken throughout the pre and post-retrofit periods. Engineering calculations using the short term, long term or continuous measured variables determine both the baseline energy use and post installation energy use. The savings are determined by comparison of the pre-installation measurements to the post-installation measurements results.
- **Option C – Whole Building**
 Often referred to as the “whole house” method to determine savings, this option uses the current year utility bills as compared to historical bills determined to be the baseline. The historical bills are adjusted to account for factors such as weather, outdoor air increases, changes in facility use, and other baseline adjustments outlined in the Energy Audit. The savings are determined by analysis of utility meter (or sub-meter) data using techniques from simple comparison to regression analysis
- **Option D - Calibrated Building Simulation**
 Option D is not an option for DGS Small GESA projects.

ECM Number	ECM Title	M&V Methodology
EM-1	Facility Lighting Fixture Conversion to LED	IPMVP Option A
FTBS-2	High-Efficiency Dual Fired Oil/Gas Burners Conversion	IPMVP Option C

McClure has a full time, locally residing engineer assigned to manage the measurement and verification process of this contract. Richard Skinner, P.E., the Measurement and Verification (M&V) manager, will be the supervisor responsible for all ongoing M&V. Richard will also have a support staff of technicians and engineers that will be assigned to this project to perform the necessary functions to accurately determine the reduction in energy use and provide the required reports in the timely fashion.

In a post-installation M&V verification, McClure Company and the customer agree that the proper equipment components or systems were installed, are operating correctly and have the potential to generate the predicted savings. Verification methods may include surveys, inspections and/or continuous metering. McClure Company is expected to complete the system/equipment commissioning. McClure Company and the customer will determine energy savings in accordance with an agreed-upon M&V method using verification techniques defined in this M&V plan.

The Scalability for Measurement and Verification Plan of the Proposed Energy Baseline, Adjustment Factors and Energy Cost Savings has been quantified. McClure’s M&V plan is scalable for one Energy Conservation Measure (ECM) measurement and verification criteria to the entire program. Scaling allows McClure’s team to separately measure each ECM and calculate the aggregate of savings attributed to the program. Below is a summary of the scalability components of the plan:

- **Proposed Energy Baseline:** During the performance period it may be necessary to adjust the baseline for changes in the facilities use. Common adjustments are made for items such as:
 - Changes in building occupancy
 - Additions to the building foot print
 - Weather
 - Operational (schedule and /or temperature set point, equipment operation, etc) changes
 - Equipment maintenance changes
- **Adjustment Factors:** McClure Company has adjusted the annual electrical use to account for the operation of the flue gas recirculation system (FGR). The system was installed to mitigate flue exhaust gases when firing the coal boilers; however, it is not currently in operation. The adjustment is 507,767 kWh and has been calculated using a custom weather bin analysis and boiler operational parameters.
 - There may be other circumstances that require the baseline to be adjusted during the Energy Audit (EA) period. These circumstances include, but are not limited to, changes in the facilities use, changes in occupancy, adjustments for weather compared to the baseline heating and cooling degree days as provided by NOAA, and modification to the outside air ventilation flow rates as required by code.
- **Energy Cost Savings:** To calculate the energy cost savings, McClure will conduct building surveys, monitor the facilities, and verify the energy savings. There are four industry-accepted options to verifying energy savings that were created as part of the International Performance Measurement and Verification Protocol (IPMVP); Option A, B, C & D.

4.2 Reasonable and Transparent Cost Approach to M&V Plan

McClure has a reasonable and transparent approach to pricing the costs to measure and verify the guaranteed savings as described clearly and thoroughly below.

McClure’s has determined a *reasonable cost approach* for one year M&V of \$25,000. This cost was determined by using the Table 8 below is a breakdown of the anticipated M&V tasks and associated costs. The first ECM, EM-1: Facility Lighting Fixture Conversion to LED will be measured and verified through IPMVP Option A. The second ECM, FTBS-2: High-Efficiency Dual Fired Oil/Gas Burners Conversion will be measured and verified through IPMVP Option C.

McClure has a *transparent cost approach* to measure and verify the guaranteed savings. McClure will review the tasks and timelines with the Commonwealth prior to final selection of M&V options for each Energy Conservation Measure. McClure will provide the hourly rates and the estimated time and scope of M&V implementation to the Commonwealth, for a complete open-book pricing review.

Table 8 – M&V Cost Breakdown

ECM	TASK DESCRIPTION	COST
M-1: Facility Lighting Fixture Conversion to LED	<ul style="list-style-type: none"> ✓ Spot metering of select circuits to include at minimum 10% of all building fixtures scheduled for retrofit completed by M&V Technician pre and post installation. ✓ Site verification of failed lighting fixtures and lamps (burnouts) by M&V Technician during spot metering ✓ Analysis of metered results and site verification using stipulated hours to develop energy use baseline and post project energy use of the same circuits by M&V Specialist. 	\$17,000

FTBS-2: High-Efficiency Dual Fired Oil/Gas Burners Conversion	<ul style="list-style-type: none"> ✓ Compare historical energy use to post installation energy use. The actual utility bills will provide the basis of comparison. ✓ The baseline energy use will be adjusted to account for changes in the weather between the baseline year and current year of measurement and verification. ✓ Along with a comparison of baseline energy use to post installation energy use, the post installation energy can be compared to the expected savings on a monthly basis. The equations below represent the format that will be used to determine energy savings. <p>Savings Calculation:</p> <ul style="list-style-type: none"> ○ HDD Impact = Percentage Adjusted Baseline Impacted by Heating Degree Days (HDD) \$8,000 ○ Weather ADJ = Current Month HDD/ Current Month Baseline HDD ○ ADJ Baseline = (Contract Baseline * Weather Adj * HDD impact) + ((1 – HDD Impact)*Contract Baseline) + OA ADJ <p>Gas Determination</p> <ul style="list-style-type: none"> ○ Measured Savings = Adj. Baseline – Year One <p>Electric Determination</p> <ul style="list-style-type: none"> ○ Measured Savings = (Adj. Baseline – (Lighting savings +other savings)) – Year One
	ANNUAL MEASUREMENT AND VERIFICATION FEE: \$25,000

1.3 M&V Plan DGS and IPMVP Compliance

As indicated below, McClure’s M&V pricing is premised upon design and construction in compliance with DGS’ Design Manual and General Conditions and also in compliance with the International Performance Measurement and Verification Protocol (IPMVP).

McClure’s plan is *compliant with DGS’ Design Manual and General Conditions* requirements. Upon completion of the design and construction phase, McClure will perform ongoing services to assure savings and guarantees are met, together with the required and appropriate staff training, maintenance services, and measurement and verification (M&V) services. The M&V services will adhere to all federal M&V protocol standards and scalability for M&V of the energy baseline, adjustment factors, and energy cost savings. M&V costs are included in our cost submission for the first three years. McClure’s Assured Performance Guarantee (APG) will meet the criterion located in the Small GESA Contract, as outlined in McClure’s AFQ submission on August 7, 2014.

McClure’s plan is *complaint with International Performance Measurement and Verification Protocol (IPMVP)*. IPMVP is the industry standard for developing and implementing M&V for guaranteed energy saving projects. McClure, with over ten years of experience implementing energy projects, is very familiar with designing and implementing the four options of determining savings (A-D). McClure plans to develop and review the plan with the funding agency, DGS and other project stake holders to ensure the plan is acceptable and in compliance with DGS Design Manual and General Conditions, International Performance Measurement and Verification Protocol (IPMVP) and/or the Federal Energy Management Program (FEMP).

4.4 Measurement & Verification Methods, Schedule, Scope and Personnel

McClure approach to Measurement and Verification, including methods, schedule, scope and personnel is thoroughly described below.

Methods for providing ongoing project monitoring and maintenance services through McClure Company are extensive. For project monitoring, McClure will monitor the energy use of the facility throughout the construction year. This benchmarking provides an early indicator of whether the Year 1 savings will be fully realized. This step allows McClure

to successfully understand the energy saving characteristics, and if any problems are discovered, ample time to correct the problem. For ongoing maintenance services, McClure has an in-house 24- hour mechanical emergency service department, which has over fifteen full time field service technicians. The service department works closely with Energy Services team to insure the project is operating in accordance with the expectation of achieving the energy savings guaranteed. McClure Company has full service office locations in: Harrisburg, Wilkes-Barre, Williamsport and State College. Being able to provide 24 hour emergency service is an important element to performance contracting, as McClure is not reliant on subcontractors to respond to a situation.

Schedule for the ongoing project monitoring is critical in ensuring the project energy savings calculated are realized in Year 1. Below is a summary of the project monitoring schedule:

Milestone	Timeline
Construction Period Start	October 2017
Construction Period End	October 2018
Project Monitoring for Construction Year Report Delivery	December 2018
First Year Energy Savings Start	November 2018
First Year Energy Savings End	October 2019
Project Monitoring for Year 1 Report Delivery	December 2019

Scope for the ongoing project monitoring includes all the energy conservation measures (ECMs) and the associated equipment, including lighting, lighting controls, building management system and components, boiler and new steam accessories and all building envelope installations. The scope for the project monitoring includes measuring and verifying the associated savings for each ECM. The protocol to complete this is identified and outlined in the next section, *X. Measurement and Verification*. The goal is to successfully measure and verify the energy savings calculated after one year of the systems being in place. All savings projected for the project are guaranteed.

Personnel for the ongoing project monitoring are critical in quantifying and calculating the total energy savings associated with the project. Richard Skinner, P.E., the Measurement and Verification (M&V) manager, will be the supervisor responsible for all ongoing project monitoring. Shayne Homan, Department Director, will oversee Richard’s work and manages the entire process.

The conditions for project monitoring a fully occupied facility will need to be carefully coordinated with the Selinsgrove Center. Most facilities McClure Company monitors are occupied. McClure will leverage this expertise and present innovative ways to complete the necessary monitoring without disrupting the occupied environment.

The extra costs of providing scheduled preventive maintenance, warranty work, emergency service, additional training of Selinsgrove Center staff will be minimal and can be discussed in more detailed once the Energy Audit (EA) is complete. Any extra costs will be directly linked to project scope, which will be more defined once the final Energy Conservation Measures (ECMs) are identified.

Attachments

Response to
Small GESA Request for Proposals

For A Guaranteed Energy Savings Contractor For:

Small GESA-3 Project for
Department of General Services at

Department of Human Services
Selinsgrove Center

Commonwealth of Pennsylvania
Department of General Services
Harrisburg, PA

ATTACHMENT 1 – ENERGY CALCULATIONS

McClure Company has provided a preliminary assessment for each energy conservation measure (ECM) opportunity, including a detailed estimate of implementation costs and energy cost savings. Detailed calculations for the energy cost savings can be found in this Attachment. The preliminary assessment of the energy efficiency opportunities available the Selinsgrove Center is based upon the information provided in the RFP and a tour of the facility.

Boiler Fuel Conversion

4,140	Tons Coal FY 2015
296,780	CCF Gas FY 2015

48.86%	Existing Boiler Efficiency
77.00%	Existing Boiler Efficiency

\$ 119.24	per ton
\$ 0.44	per CCF

*values calculated from Monthly Utilities Usage Report in RFP

Utility Cost Existing	
\$ 493,636.00	
\$ 129,545.00	

Utility Cost Proposed	
\$ -	
\$ 416,966.08	

Savings	
\$ 493,636.00	
\$ (287,421.08)	
\$ 206,214.92	

	Burners		MMBTU/Hr
	1	2	
25,000,000	BTU/Ton Coal		
102,400	BTU/CCF Gas		
50,570	MMBTU Campus Load		
658,465	CCF Gas		
659,343	MCF Proposed		
29,678	MCF Existing		
95,524	MCF Total		
	Input	20.1	16.7
	SCFH	20085	16729
	BTU/SCF	1000	1000
	BTU	20085000	16729000
	QTY	2	2
	Total BTU	40170000	33458000
	PPH	50000	25000
	BTU/lb @ 180 PSI	1198	1198
	BTU/Hr	3,594,000	2,995,600
	Combustion Efficiency	89%	90%
	Proposed System Efficiency	75%	75%

Boiler Operation Projections

Month	Maker-Up Water (lbs)	Maker-Up %	Peak Steam	HDD	CDD	Coal Produced (lbs)	Coal Consumed (Tons)	Coal Efficiency	Gas Produced (lbs)	Gas Consumed (MCF)	Gas Efficiency	77.72%	894	MCF (Estimate)	Total Steam	Parts	Misc	Service	Repair	Wages	Wages Adjusted	Adjustment	Total
Jan-14	3,258,432	22.87%	23,500	1353	0	13,651,443	937	49.24%	0	0	0	0	15,267	13,651,443	\$22	\$3,639	\$68	\$0	\$0	\$68,818	\$68,818	\$0	\$72,547
Feb-14	3,252,600	21.68%	21,500	1120	0	11,751,267	845	47.01%	0	0	0	0	13,142	11,751,267	\$2,693	\$3,232	\$73	\$0	\$0	\$67,018	\$67,018	\$0	\$73,016
Mar-14	2,830,596	24.64%	21,500	992	0	11,489,641	815	47.65%	0	0	0	0	12,849	11,489,641	\$2,318	\$4,235	\$85	\$0	\$0	\$67,919	\$67,919	\$0	\$74,557
Apr-14	1,774,752	23.56%	14,500	480	0	7,252,223	506.54	48.39%	0	0	0	0	8,110	7,252,223	\$0	\$0	\$0	\$0	\$0	\$61,837	\$61,837	\$0	\$61,837
May-14	1,256,838	24.65%	10,500	129	55	503,626	63	48.47%	4,194,932	4618	79.04%	0	908	5,098,358	\$34,987	\$366	\$51	\$0	\$0	\$99,700	\$61,700	\$38,000	\$125,004
Jun-14	1,022,468	28.97%	7,000	3	217	0	0	48.42%	4,065,188	4542.5	77.87%	895	4,065,188	\$4,953	\$4,953	\$0	\$0	\$0	\$0	\$94,966	\$61,966	\$33,000	\$109,321
Jul-14	972,404	21.79%	6,500	0	283	0	0	0	4,047,079	4562	77.19%	887	4,047,079	\$327	\$4,755	\$0	\$0	\$0	\$0	\$62,666	\$62,666	\$0	\$67,748
Aug-14	858,196	21.77%	8,000	3	164	0	0	0	3,942,510	4444	77.19%	887	3,942,510	\$4,655	\$856	\$0	\$0	\$0	\$0	\$60,605	\$60,605	\$0	\$66,116
Sep-14	793,134	19.33%	9,500	80	84	0	0	0	4,103,776	4629	77.14%	887	4,103,776	\$2,791	\$2,843	\$0	\$0	\$0	\$0	\$65,480	\$65,480	\$0	\$68,602
Oct-14	1,015,812	17.84%	13,500	303	0	2,197,774	158	47.02%	3,495,754	3753	81.05%	931	3,753	5,693,528	\$136	\$644	\$0	\$0	\$7,450	\$101,991	\$69,991	\$38,000	\$109,321
Nov-14	1,093,494	13.96%	19,000	787	0	8,801,516	551	53.99%	0	0	0	0	9,843	8,801,516	\$2,141	\$95	\$4,058	\$0	\$0	\$62,661	\$62,661	\$0	\$68,955
Dec-14	1,637,128	17.38%	19,000	930	0	10,463,641	725.71	48.73%	0	0	0	0	11,702	10,463,641	\$0	\$0	\$0	\$0	\$0	\$66,604	\$66,604	\$0	\$66,604
Jan-15	1,951,560	23.87%	22,000	1241	0	12,689,214	884.12	48.51%	0	0	0	0	14,191	12,689,214	\$0	\$0	\$0	\$0	\$0	\$66,604	\$66,604	\$0	\$66,604
Feb-15	2,107,518	27.68%	23,500	1267	0	12,500,842	886.08	47.69%	0	0	0	0	13,980	12,500,842	\$0	\$0	\$0	\$0	\$0	\$66,604	\$66,604	\$0	\$66,604
Mar-15	2,335,200	24.64%	21,000	972	0	10,809,166	778.15	46.95%	0	0	0	0	12,088	10,809,166	\$0	\$0	\$0	\$0	\$0	\$66,604	\$66,604	\$0	\$66,604
Apr-15	1,778,088	26.98%	16,500	409	162	7,547,155	509	50.17%	3,895,177	4374	77.49%	891	4,374	5,129,006	\$1,546	\$2,759	\$73	\$0	\$0	\$61,837	\$61,837	\$30,000	\$99,732
May-15	1,383,606	26.98%	9,500	64	162	1,233,629	88	47.39%	4,368,708	4929	77.12%	886	4,929	4,368,708	\$625	\$2,696	\$6,200	\$0	\$0	\$94,966	\$64,966	\$30,000	\$104,424
Jun-15	1,276,510	28.97%	7,500	14	228	0	0	0	4,283,585	4851	76.83%	883	4,851	4,283,585	\$128	\$410	\$0	\$0	\$0	\$58,676	\$58,676	\$0	\$59,214
Jul-15	788,114	20.66%	6,000	0	218	0	0	0	3,828,446	4297	77.52%	891	4,297	3,828,446	\$274	\$177	\$0	\$0	\$0	\$58,642	\$58,642	\$0	\$59,193
Aug-15	707,232	18.79%	7,000	30	150	0	0	0	3,766,689	4230	77.48%	890	4,230	3,766,689	\$3,469	\$643	\$0	\$0	\$0	\$59,833	\$59,833	\$0	\$70,440
Sep-15	1,143,414	18.95%	12,500	392	0	3,841,866	267	48.63%	2,191,994	2487	76.69%	881	2,487	6,033,860	\$3,574	\$1,665	\$0	\$0	\$0	\$92,428	\$62,428	\$30,000	\$99,418
Oct-15	1,291,024	18.62%	15,500	526	0	6,879,309	481	48.34%	0	0	0	0	7,693	6,879,309	\$1,055	\$1,055	\$0	\$0	\$0	\$64,302	\$64,302	\$0	\$75,557
Nov-15	1,601,280	17.26%	16,000	702	0	9,278,106	667	47.07%	0	0	0	0	10,376	9,278,106	\$71	\$85	\$340	\$0	\$0	\$62,463	\$62,463	\$0	\$62,759
Dec-15	2,276,820	18.99%	22,500	1163	0	12,378,754	928	45.09%	0	0	0	0	13,843	12,378,754	\$148	\$108	\$6,302	\$0	\$0	\$61,366	\$61,366	\$0	\$67,972
Jan-16	1,919,034	16.89%	23,000	961	0	11,360,403	800	48.00%	0	0	0	0	12,705	11,360,403	\$38	\$6,506	\$0	\$0	\$0	\$61,920	\$61,920	\$0	\$68,464
Feb-16	1,418,624	15.83%	18,000	598	0	8,959,076	669	45.26%	0	0	0	0	10,019	8,959,076	\$54	\$54	\$400	\$0	\$0	\$64,065	\$64,065	\$0	\$64,885
Mar-16	1,155,924	15.34%	11,500	469	0	4,968,562	328	51.20%	25,678,827	2739	81.58%	938	2,739	7,536,449	\$0	\$0	\$0	\$0	\$0	\$89,209	\$89,209	\$25,000	\$96,480
Apr-16	990,792	17.26%	10,500	175	87	0	0	0	5,741,792	6231	80.18%	921	6,231	5,741,792	\$4,795	\$1,034	\$0	\$0	\$0	\$59,086	\$59,086	\$0	\$94,844
May-16	865,692	20.20%	8,500	16	236	0	0	0	4,285,516	4843	77.00%	885	4,843	4,285,516	\$1,994	\$776	\$0	\$0	\$0	\$60,853	\$60,853	\$0	\$70,783
Jun-16	894,882	21.41%	6,000	0	430	0	0	0	4,179,041	4711	77.19%	887	4,711	4,179,041	\$0	\$0	\$0	\$0	\$0	\$59,898	\$59,898	\$0	\$75,519
Jul-16	855,684	21.37%	6,500	0	399	0	0	0	4,004,490	4480	77.60%	892	4,490	4,004,490	\$6,026	\$338	\$0	\$0	\$0	\$60,576	\$60,576	\$0	\$64,940
Sep-16																							
Oct-16																							
Nov-16																							
Dec-16																							

\$101,896 Operation
\$14,216 Coal/Boiler/Operator

Water Analysis

Month	kGal Total	Boiler Make Up kGal	Facility Use kGal	Water Cost	Water \$/kGal	Sewer Cost	Sewer \$/kGal	Total Cost	Total \$/kGal	\$/kGal for Facility Use (exclude Boiler Make Up)	
Jan-13	3,518	312	3,206	\$ 6,348.00	\$ 1.80	\$ 20,607.00	\$ 5.86	\$ 26,955.00	\$ 7.66	\$ 8.41	\$ 2.10
Feb-13	3,591	321	3,270	\$ 6,332.00	\$ 1.76	\$ 20,607.00	\$ 5.74	\$ 26,939.00	\$ 7.50	\$ 8.24	\$ 5.41
Mar-13	4,039	309	3,730	\$ 7,285.00	\$ 1.80	\$ 20,607.00	\$ 5.10	\$ 27,892.00	\$ 6.91	\$ 7.48	
Apr-13	3,581	213	3,368	\$ 6,815.00	\$ 1.90	\$ 20,607.00	\$ 5.75	\$ 27,422.00	\$ 7.66	\$ 8.14	
May-13	3,443	158	3,285	\$ 9,603.00	\$ 2.79	\$ 20,607.00	\$ 5.99	\$ 30,210.00	\$ 8.77	\$ 9.20	
Jun-13	3,573	136	3,437	\$ 5,354.00	\$ 1.50	\$ 20,607.00	\$ 5.77	\$ 25,961.00	\$ 7.27	\$ 7.55	
Jul-13	3,113	132	2,981	\$ 7,650.00	\$ 2.46	\$ 20,607.00	\$ 6.62	\$ 28,257.00	\$ 9.08	\$ 9.48	
Aug-13	3,666	97	3,569	\$ 7,658.00	\$ 2.09	\$ 20,607.00	\$ 5.62	\$ 28,265.00	\$ 7.71	\$ 7.92	
Sep-13	3,350	90	3,260	\$ 5,223.00	\$ 1.56	\$ 20,607.00	\$ 6.15	\$ 25,830.00	\$ 7.71	\$ 7.92	
Oct-13	3,069	122	2,947	\$ 7,820.00	\$ 2.55	\$ 20,607.00	\$ 6.71	\$ 28,427.00	\$ 9.26	\$ 9.64	
Nov-13	3,600	143	3,457	\$ 9,435.00	\$ 2.62	\$ 20,607.00	\$ 5.72	\$ 30,042.00	\$ 8.35	\$ 8.69	
Dec-13	4,204	194	4,010	\$ 8,397.00	\$ 2.00	\$ 20,607.00	\$ 4.90	\$ 29,004.00	\$ 6.90	\$ 7.23	
Jan-14	4,343	390	3,953	\$ 5,247.00	\$ 1.21	\$ 20,607.00	\$ 4.74	\$ 25,854.00	\$ 5.95	\$ 6.54	
Feb-14	4,311	390	3,921	\$ 8,475.00	\$ 1.97	\$ 20,607.00	\$ 4.78	\$ 29,082.00	\$ 6.75	\$ 7.42	
Mar-14	4,571	339	4,232	\$ 8,139.00	\$ 1.78	\$ 20,607.00	\$ 4.51	\$ 28,746.00	\$ 6.29	\$ 6.79	
Apr-14	3,839	213	3,626	\$ 5,248.00	\$ 1.37	\$ 20,607.00	\$ 5.37	\$ 25,855.00	\$ 6.73	\$ 7.13	
May-14	3,735	151	3,584	\$ 10,189.00	\$ 2.73	\$ 20,607.00	\$ 5.52	\$ 30,796.00	\$ 8.25	\$ 8.59	
Jun-14	3,502	120	3,382	\$ 10,584.00	\$ 3.02	\$ 20,607.00	\$ 5.88	\$ 31,191.00	\$ 8.91	\$ 9.22	
Jul-14	3,396	110	3,286	\$ 7,341.00	\$ 2.16	\$ 20,607.00	\$ 6.07	\$ 27,948.00	\$ 8.23	\$ 8.51	
Aug-14	3,688	103	3,585	\$ 7,577.00	\$ 2.05	\$ 20,607.00	\$ 5.59	\$ 28,184.00	\$ 7.64	\$ 7.86	
Sep-14	3,230	95	3,135	\$ 7,786.00	\$ 2.41	\$ 20,607.00	\$ 6.38	\$ 28,393.00	\$ 8.79	\$ 9.06	
Oct-14	3,587	122	3,465	\$ 9,668.00	\$ 2.70	\$ 20,607.00	\$ 5.74	\$ 30,275.00	\$ 8.44	\$ 8.74	
Nov-14	3,932	143	3,789	\$ 7,693.00	\$ 1.96	\$ 20,607.00	\$ 5.24	\$ 28,300.00	\$ 7.20	\$ 7.47	
Dec-14	4,082	194	3,888	\$ 7,674.00	\$ 1.88	\$ 20,607.00	\$ 5.05	\$ 28,281.00	\$ 6.93	\$ 7.27	
Jan-15	4,456	234	4,222	\$ 5,471.00	\$ 1.23	\$ 20,607.00	\$ 4.62	\$ 26,078.00	\$ 5.85	\$ 6.18	
Feb-15	4,107	252	3,855	\$ 9,040.00	\$ 2.20	\$ 20,607.00	\$ 5.02	\$ 29,647.00	\$ 7.22	\$ 7.69	
Mar-15	4,796	280	4,516	\$ 7,453.00	\$ 1.55	\$ 20,607.00	\$ 4.30	\$ 28,060.00	\$ 5.85	\$ 6.21	
Apr-15	3,753	213	3,540	\$ 13,709.00	\$ 3.65	\$ 20,607.00	\$ 5.49	\$ 34,316.00	\$ 9.14	\$ 9.69	
May-15	4,276	166	4,110	\$ 10,966.00	\$ 2.56	\$ 20,607.00	\$ 4.82	\$ 31,573.00	\$ 7.38	\$ 7.68	
Jun-15	3,164	151	3,013	\$ 13,733.00	\$ 4.34	\$ 20,607.00	\$ 6.51	\$ 34,340.00	\$ 10.85	\$ 11.40	
Jul-15	2,085	153	1,932	\$ 7,574.00	\$ 3.63	\$ 20,607.00	\$ 9.88	\$ 28,181.00	\$ 13.52	\$ 14.59	
Aug-15	1,762	92	1,670	\$ 5,759.00	\$ 3.27	\$ 20,607.00	\$ 11.70	\$ 26,366.00	\$ 14.96	\$ 15.79	
Sep-15	2,112	85	2,027	\$ 9,171.00	\$ 4.34	\$ 20,607.00	\$ 9.76	\$ 29,778.00	\$ 14.10	\$ 14.69	
				2014 Average	\$ 2.10		\$ 5.41				

Estimated Water Rate
Estimated Sewer Rate

Facility Savings %	Proposed Facility Use kGal	Estimated Water Savings	Estimated Water Cost @ \$2.1 /kGal	Estimated Sewer Cost @ \$5.41 /kGal	Estimated Total Cost	Estimated Water/ Sewer Savings	Estimated Water Only Savings
25%	2,405	1,113	\$5,049	\$13,008	\$18,058	\$ 8,897.07	\$ 2,338.31
25%	2,453	1,138	\$5,150	\$13,268	\$18,418	\$ 8,520.53	\$ 2,390.80
25%	2,797	1,242	\$5,874	\$15,133	\$21,007	\$ 6,884.63	\$ 2,607.67
25%	2,526	1,055	\$5,305	\$13,667	\$18,972	\$ 8,450.30	\$ 2,215.10
25%	2,464	979	\$5,174	\$13,328	\$18,502	\$ 11,707.86	\$ 2,056.60
25%	2,578	995	\$5,414	\$13,947	\$19,361	\$ 6,600.34	\$ 2,089.53
25%	2,236	877	\$4,696	\$12,097	\$16,792	\$ 11,464.50	\$ 1,841.66
25%	2,676	990	\$5,621	\$14,480	\$20,100	\$ 8,164.77	\$ 2,078.03
25%	2,445	905	\$5,135	\$13,228	\$18,363	\$ 7,467.16	\$ 1,900.25
25%	2,211	858	\$4,642	\$11,959	\$16,601	\$ 11,826.07	\$ 1,802.83
25%	2,593	1,007	\$5,445	\$14,027	\$19,472	\$ 10,570.05	\$ 2,115.11
25%	3,008	1,196	\$6,316	\$16,272	\$22,588	\$ 6,415.81	\$ 2,512.13
25%	2,965	1,378	\$6,226	\$16,038	\$22,264	\$ 3,590.03	\$ 2,894.69
25%	2,941	1,370	\$6,176	\$15,911	\$22,088	\$ 6,994.34	\$ 2,876.79
25%	3,174	1,397	\$6,665	\$17,171	\$23,837	\$ 4,909.22	\$ 2,933.69
25%	2,720	1,119	\$5,712	\$14,714	\$20,426	\$ 5,428.99	\$ 2,350.23
25%	2,688	1,047	\$5,646	\$14,544	\$20,190	\$ 10,606.41	\$ 2,197.94
25%	2,536	966	\$5,327	\$13,722	\$19,049	\$ 12,142.20	\$ 2,027.64
25%	2,464	932	\$5,175	\$13,331	\$18,506	\$ 9,442.24	\$ 1,956.89
25%	2,689	999	\$5,647	\$14,547	\$20,194	\$ 7,990.23	\$ 2,098.07
25%	2,351	879	\$4,938	\$12,720	\$17,658	\$ 10,735.03	\$ 1,845.35
25%	2,599	988	\$5,458	\$14,061	\$19,519	\$ 10,756.44	\$ 2,074.78
25%	2,842	1,090	\$5,968	\$15,374	\$21,342	\$ 6,958.06	\$ 2,289.41
25%	2,916	1,166	\$6,124	\$15,777	\$21,901	\$ 6,379.97	\$ 2,448.08
25%	3,167	1,289	\$6,650	\$17,132	\$23,782	\$ 2,296.01	\$ 2,707.51
25%	2,891	1,216	\$6,071	\$15,640	\$21,711	\$ 7,935.95	\$ 2,553.70
25%	3,387	1,409	\$7,113	\$18,325	\$25,438	\$ 2,621.74	\$ 2,958.37
25%	2,655	1,098	\$5,576	\$14,364	\$19,939	\$ 14,376.64	\$ 2,305.71
25%	3,083	1,193	\$6,474	\$16,678	\$23,151	\$ 8,421.74	\$ 2,505.88
25%	2,260	904	\$4,745	\$12,224	\$16,969	\$ 17,371.07	\$ 1,899.43
25%	1,449	636	\$3,043	\$7,840	\$10,883	\$ 17,297.98	\$ 1,335.31
25%	1,253	509	\$2,630	\$6,776	\$9,406	\$ 16,959.67	\$ 1,069.93
25%	1,520	592	\$3,193	\$8,226	\$11,419	\$ 18,359.22	\$ 1,242.20

PRELIMINARY AUDIT

EXISTING FEATURES

PROPOSED FEATURE UPGRADE

ID #	Facility Name	Phase	Room Description	ECM Code	Qty	Description	Watts	W	Pts Sum Hours	W/h	City	New Code	Description	W/h	KW	KW Saved	Pend Burn Hours	W/h	KWh Saved
1	BLDG 44	INTERIOR	SUMMARY	CE09RLM	14	05 Watt Compact Fluorescent PLR Fixtures	65	0.910	1600	1,365	14	N3-32-LED	Re-Lamp with (1) 10 Watt LED A10 Lamp, Direct View to Socket	26	0.320	0.590	1,500	525	840
2	BLDG 44	INTERIOR	SUMMARY	CF23	6	23 Watt Compact Fluorescent Fixture	23	0.138	1000	207	6	LED 19A	Re-Lamp with (1) 10 Watt LED A10 Lamp, Direct View to Socket	10	0.066	0.076	1,000	90	117
3	BLDG 44	INTERIOR	SUMMARY	20C04	1	T10 164 2-Lamp 080 Crab Fixture	72	0.022	1500	104	1	R3-10-LED	Re-Lamp with (2) 13.5 Watt LED T10 Lamps, Direct View to Socket	20	0.025	0.047	1,000	36	71
4	BLDG 44	INTERIOR	SUMMARY	2PL19BC	2	13 Watt Plug-In CFL Fixture	25	0.099	1000	64	2	R2PL-LED	Re-Lamp with (2) 18 Watt LED Plug-In Lamps, Direct View to Socket	12	0.024	0.032	1,000	34	41
5	BLDG 44	EXTERIOR	SUMMARY	3PL2AMP	1	25 Watt Plug-In CFL Fixture	54	0.091	1000	67	1	R2PL-11-LED	Re-Lamp with (2) 11 Watt LED Plug-In Lamps, Direct View to Socket	26	0.020	0.002	1,000	20	45
6	BLDG 34	INTERIOR	SUMMARY	1626	31	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	22	0.092	2800	1,091	31	R1-10-LED	Re-Lamp with (1) 12.5 Watt LED T8 Lamps, Direct View to Socket	12.5	0.398	0.206	2,800	1,108	942
7	BLDG 34	INTERIOR	SUMMARY	1W25	17	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	22	0.374	2100	1,070	17	R1-10-LED	Re-Lamp with (1) 12.5 Watt LED T8 Lamps, Direct View to Socket	12.5	0.243	0.162	2,800	608	402
8	BLDG 34	INTERIOR	SUMMARY	2PL19BC	2	13 Watt Plug-In CFL Fixture	25	0.094	2800	190	2	R2PL-LED	Re-Lamp with (2) 18 Watt LED Plug-In Lamps, Direct View to Socket	12	0.024	0.002	2,800	60	92
9	BLDG 34	INTERIOR	SUMMARY	4EC26	1	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	40	0.095	2800	240	1	R4-10-LED	Re-Lamp with (4) 12.5 Watt LED T8 Lamps, Direct View to Socket	50	0.090	0.029	2,800	140	100
10	BLDG 34	INTERIOR	SUMMARY	106	10	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	22	0.220	2100	620	10	R4-10-LED	Re-Lamp with (1) 12.5 Watt LED T8 Lamps, Direct View to Socket	12.5	0.122	0.096	2,800	396	272
11	BLDG 34	INTERIOR	SUMMARY	2PL19BC	4	13 Watt Plug-In CFL Fixture	25	0.112	2800	200	4	R2PL-LED	Re-Lamp with (2) 18 Watt LED Plug-In Lamps, Direct View to Socket	12	0.048	0.044	2,800	137	103
12	BLDG 34	INTERIOR	SUMMARY	4W25	10	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	40	0.650	2100	2,401	10	R4-10-LED	Re-Lamp with (1) 12.5 Watt LED T8 Lamps, Direct View to Socket	50	0.090	0.000	2,800	1,400	1,001
13	BLDG 34	INTERIOR	SUMMARY	20C05	10	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	40	0.400	2100	1,300	10	R2-10-LED	Re-Lamp with (2) 15 Watt LED T8 Lamps, Direct View to Socket	25	0.260	0.100	2,800	775	916
14	BLDG 34	INTERIOR	SUMMARY	4EC26	1	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	40	0.095	2800	240	1	R4-10-LED	Re-Lamp with (4) 12.5 Watt LED T8 Lamps, Direct View to Socket	50	0.090	0.038	2,800	140	100
15	BLDG 34	EXTERIOR	SUMMARY	3PL2AMP	6	25 Watt Plug-In CFL Fixture	54	0.348	2800	696	6	R2PL-11-LED	Re-Lamp with (2) 11 Watt LED Plug-In Lamps, Direct View to Socket	26	0.196	0.102	2,800	446	549
16	BLDG 32	INTERIOR	SUMMARY	4W25	7	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	40	0.099	2800	1,702	7	R4-10-LED	Re-Lamp with (1) 12.5 Watt LED T8 Lamps, Direct View to Socket	50	0.390	0.249	2,800	1,001	701
17	BLDG 32	INTERIOR	SUMMARY	100	38	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	22	0.058	2000	2,404	38	R1-10-LED	Re-Lamp with (1) 12.5 Watt LED T8 Lamps, Direct View to Socket	12.5	0.408	0.374	2,800	1,384	1,090
18	BLDG 32	INTERIOR	SUMMARY	2PL19BC	14	13 Watt Plug-In CFL Fixture	25	0.302	2800	1,921	14	R2PL-LED	Re-Lamp with (2) 18 Watt LED Plug-In Lamps, Direct View to Socket	12	0.199	0.224	2,800	460	641
19	BLDG 32	INTERIOR	SUMMARY	1W25	3	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	22	0.099	2800	180	3	R1-10-LED	Re-Lamp with (1) 12.5 Watt LED T8 Lamps, Direct View to Socket	12.5	0.024	0.020	2,800	107	82
20	BLDG 32	INTERIOR	SUMMARY	4L25	2	T8 24-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	95	0.170	2800	486	2	R4-10-LED	Re-Lamp with (4) 12.5 Watt LED T8 Lamps, Direct View to Socket	50	0.100	0.070	2,800	280	200
21	BLDG 32	INTERIOR	SUMMARY	3L25	2	T8 24-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	43	0.046	2800	246	2	R2-10-LED	Re-Lamp with (2) 15 Watt LED T8 Lamps, Direct View to Socket	25	0.090	0.029	2,800	140	103
22	BLDG 32	INTERIOR	SUMMARY	3L25	3	T8 24-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	43	0.120	2800	399	3	R2-10-LED	Re-Lamp with (2) 15 Watt LED T8 Lamps, Direct View to Socket	25	0.070	0.024	2,800	215	164
23	BLDG 32	INTERIOR	SUMMARY	2C005	2	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	43	0.046	2800	246	2	R2-10-LED	Re-Lamp with (2) 15 Watt LED T8 Lamps, Direct View to Socket	25	0.010	0.039	2,800	140	103
24	BLDG 32	INTERIOR	SUMMARY	100A	2	100 Watt Incandescent Lamp Fixture	100	0.300	2800	806	2	LED 16A	Re-Lamp with (1) 16 Watt LED A16 Lamp, Direct View to Socket	16	0.031	0.264	2,800	100	706
25	BLDG 32	INTERIOR	SUMMARY	4EC26	2	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	40	0.170	2800	486	2	R4-10-LED	Re-Lamp with (4) 12.5 Watt LED T8 Lamps, Direct View to Socket	50	0.100	0.070	2,800	280	200
26	BLDG 31	INTERIOR	SUMMARY	1W25	12	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	22	0.264	2800	799	12	R1-10-LED	Re-Lamp with (1) 12.5 Watt LED T8 Lamps, Direct View to Socket	12.5	0.190	0.144	2,800	420	320
27	BLDG 31	INTERIOR	SUMMARY	2W25	6	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	43	0.307	2800	1,107	6	R2-10-LED	Re-Lamp with (2) 15 Watt LED T8 Lamps, Direct View to Socket	25	0.226	0.162	2,800	644	483
28	BLDG 31	INTERIOR	SUMMARY	2W25	46	T8 164 2-Lamp 080 Crab Fixture with 20 Watt CFL Lamps	43	2.944	2800	6,900	46	R2-10-LED	Re-Lamp with (2) 15 Watt LED T8 Lamps, Direct View to Socket	25	1.200	0.664	2,800	3,422	2,471

PRELIMINARY AUDIT

EXISTING FIXTURES

PROPOSED FIXTURE UPGRADE

ID #	Facility Name	Phase	Room Description	SCM Code	Qty	Description	Watts	KW	Pre Burn Hours	kWh	City	New Code	Description	Watts	KW	RPI Saved	KW Cost Savings	Pre Burn Hours	kWh	With Saved
20	BLDG 31	INTERIOR	SUMMARY	34BKA	6	T5HO 24" 2-amp High Bay Fixture	102	1.022	2880	3,123	6	N RLED0RHG	New 95 WwLED High Bay Fixture	83	0.828	0.334	3	2,660	1,259	1,277
30	BLDG 31	INTERIOR	SUMMARY	4L26	3	T5 24" 2-amp Troffer Fixture with 25 WwLED Lamps	95	0.295	2460	729	3	R-4L-12ALD	Re-lamp with (3) 12.5 WwLED T5 4 Lamps, Direct Wire to Socket	70	0.190	0.195	3	2,160	420	300
31	BLDG 31	INTERIOR	SUMMARY	4W25	4	T5 14" 4-amp Vwp Fixture with 25 WwLED Lamps	85	0.340	2640	872	4	R-4L-12ALD	Re-lamp with (4) 12.5 WwLED T5 4 Lamps, Direct Wire to Socket	90	0.220	0.140	5	2,660	872	400
32	BLDG 31	INTERIOR	SUMMARY	1W17	1	T5 24" 2-amp Vwp Fixture	22	0.022	2660	63	1	R-1L-10LEDZ	Re-lamp with (1) 10 WwLED T5 2 Lamps, Direct Wire to Socket	10	0.010	0.012	5	2,660	29	34
33	BLDG 31	EXTERIOR	SUMMARY	2P3WVP	11	25 WwFLPH-CFL 2-amp Vwp Fixture	58	0.058	2660	1,620	11	R-2P4-11LED	Re-lamp with (11) 11 WwLED FLPH-CFL Lamps, Direct Wire to Socket	26	0.260	0.332	5	2,660	818	1,097
34	BLDG 31	EXTERIOR	SUMMARY	2P3LDCY	1	13 WwFLPH-CFL 2-amp Vwp Fixture	28	0.028	2660	80	1	R-2P4-4LED	Re-lamp with (4) 11 WwLED FLPH-CFL Lamps, Direct Wire to Socket	12	0.042	0.046	5	2,660	34	40
35	BLDG 1	INTERIOR	SUMMARY	4W25	30	T5 14" 4-amp Vwp Fixture with 25 WwLED Lamps	95	2.550	4076	11,680	30	R-4L-12ALD	Re-lamp with (4) 12.5 WwLED T5 4 Lamps, Direct Wire to Socket	50	1.000	1.000	3	4,076	6,884	4,006
36	BLDG 1	INTERIOR	SUMMARY	20025	14	T5 14" 4-amp Vwp Fixture with 25 WwLED Lamps	43	0.462	4076	2,705	14	R-2L-12ALD	Re-lamp with (12) 12.5 WwLED T5 4 Lamps, Direct Wire to Socket	22	0.350	0.282	3	4,076	1,602	1,110
37	BLDG 1	INTERIOR	SUMMARY	4E025	1	T5 14" 4-amp Vwp Fixture with 25 WwLED Lamps	95	0.095	4076	369	1	R-4L-12ALD	Re-lamp with (4) 12.5 WwLED T5 4 Lamps, Direct Wire to Socket	50	0.040	0.035	3	4,076	220	190
38	BLDG 1	INTERIOR	SUMMARY	0A1END	1	Vending Machine with Dabbling Vending Control	600	0.600	4576	1,830	1	ZZ DD	No Retrofit	400	0.400	0.000	5	4,076	1,830	0
39	BLDG 1	INTERIOR	SUMMARY	0A1END	1	Vending Machine with Dabbling Vending Control	600	0.600	4576	1,830	1	ZZ DD	No Retrofit	400	0.400	0.000	5	4,076	1,830	0
40	BLDG 1	INTERIOR	SUMMARY	1W17	1	T5 24" 2-amp Vwp Fixture	22	0.022	4076	101	1	R-1L-10LEDZ	Re-lamp with (1) 10 WwLED T5 2 Lamps, Direct Wire to Socket	10	0.010	0.012	5	4,076	40	95
41	BLDG 1	INTERIOR	SUMMARY	2017	5	T5 24" 2-amp Vwp Fixture with Troffer Fixture	35	0.190	4076	424	5	R-2L-10LEDZ	Re-lamp with (10) WwLED T5 2 Lamps, Direct Wire to Socket	20	0.100	0.090	3	4,276	493	303
42	BLDG 1	INTERIOR	SUMMARY	2W26	4	T5 14" 4-amp Vwp Fixture with 25 WwLED Lamps	43	0.172	4076	797	4	R-2L-12ALD	Re-lamp with (12) 12.5 WwLED T5 4 Lamps, Direct Wire to Socket	26	0.100	0.072	5	4,276	496	320
43	BLDG 1	INTERIOR	SUMMARY	2V17	3	T5 24" 2-amp Vwp Fixture	28	0.195	4076	484	3	R-2L-10LEDZ	Re-lamp with (10) WwLED T5 2 Lamps, Direct Wire to Socket	20	0.090	0.044	3	4,076	276	220
44	BLDG 1	INTERIOR	SUMMARY	2P15SC	30	13 WwFLPH-CFL Troffer Fixture	26	0.660	4076	3,444	30	R-2P4-4LED	Re-lamp with (12) 12 WwLED FLPH-CFL Lamps, Direct Wire to Socket	12	0.360	0.490	3	4,076	1,647	2,196
45	BLDG 1	INTERIOR	SUMMARY	0P11	5	13 Ww Compact Fluorescent Fixture	43	0.095	4076	297	5	LED 10A	Re-lamp with (1) 10 WwLED A16	16	0.090	0.015	3	4,076	220	40
46	BLDG 1	EXTERIOR	SUMMARY	2P13WP	2	13 WwFLPH-CFL 2-amp Vwp Fixture	28	0.059	4076	250	2	R-2P4-4LED	Re-lamp with (2) 4 WwLED FLPH-CFL Lamps, Direct Wire to Socket	12	0.094	0.032	3	4,076	110	146
47	BLDG 1	EXTERIOR	SUMMARY	2P3WVP	1	25 WwFLPH-CFL 2-amp Vwp Fixture	58	0.059	4076	205	1	R-2P4-11LED	Re-lamp with (2) 11 WwLED FLPH-CFL Lamps, Direct Wire to Socket	20	0.005	0.032	3	4,076	110	146
48	BLDG 1	EXTERIOR	SUMMARY	2P3LDCY	1	13 WwFLPH-CFL 2-amp Vwp Fixture	28	0.020	4076	128	1	R-2P4-4LED	Re-lamp with (2) 4 WwLED FLPH-CFL Lamps, Direct Wire to Socket	12	0.042	0.015	3	4,076	96	73
49	BLDG 30	INTERIOR	SUMMARY	3W25	1	T5 14" 4-amp Vwp Fixture with 25 WwLED Lamps	45	0.055	8736	668	1	R-3L-12ALD	Re-lamp with (12) 12.5 WwLED T5 4 Lamps, Direct Wire to Socket	37.5	0.038	0.026	3	8,736	320	240
50	BLDG 30	INTERIOR	SUMMARY	2W25	30	T5 14" 4-amp Vwp Fixture with 25 WwLED Lamps	43	1.200	8736	11,268	30	R-2L-12ALD	Re-lamp with (12) 12.5 WwLED T5 4 Lamps, Direct Wire to Socket	26	0.700	0.560	3	8,736	6,522	4,717
51	BLDG 30	INTERIOR	SUMMARY	0R6BLM	4	65 Ww Compact Fluorescent CFL Fixture	65	0.260	8736	2,271	4	N-2L-12ALD	New (4) 2-amp High Bay Fixture with (2) 12.5 WwLED T5 4 Lamps, Direct Wire to Socket	25	0.100	0.160	3	8,736	674	1,386
52	BLDG 30	INTERIOR	SUMMARY	150A	12	150 Ww Incandescent A-16 Lamp Fixture	110	1.400	8736	10,226	12	LED 10A	Re-lamp with (12) 10 WwLED A21	16	0.216	1.044	3	8,736	1,647	13,039
53	BLDG 30	INTERIOR	SUMMARY	4H5K4	0	T5HO 24" 2-amp High Bay Fixture	241	2.190	8736	16,648	0	N RLED0RHG	New 95 WwLED High Bay Fixture	83	0.837	1.332	3	8,736	7,312	11,028
54	BLDG 30	INTERIOR	SUMMARY	2L25	2	T5 24" 2-amp Troffer Fixture with 25 WwLED Lamps	43	0.096	8736	751	2	R-2L-12ALD	Re-lamp with (12) 12.5 WwLED T5 4 Lamps, Direct Wire to Socket	26	0.090	0.059	3	8,736	437	314
55	BLDG 30	INTERIOR	SUMMARY	1W25	6	T5 14" 4-amp Vwp Fixture with 25 WwLED Lamps	22	0.132	8736	1,193	6	R-1L-12ALD	Re-lamp with (12) 12.5 WwLED T5 4 Lamps, Direct Wire to Socket	12.5	0.095	0.037	3	8,736	696	498
56	BLDG 30	INTERIOR	SUMMARY	1E26	9	T5 14" 4-amp Vwp Fixture with 25 WwLED Lamps	22	0.110	8736	961	9	R-1L-12ALD	Re-lamp with (12) 12.5 WwLED T5 4 Lamps, Direct Wire to Socket	12.5	0.090	0.046	3	8,736	546	475

PRELIMINARY AUDIT

EXISTING FEATURES

PROPOSED FEATURE UPGRADE

ID #	Facility Name	Phase	Room Description	ES&M Code	Qty	Description	Watts	KW	Pre Burn Hours	With	Qty	New Code	Description	Watts	KW	Post Burn Hours	NW Saved	With	NW Saved
57	BLDG 30	INTERIOR	SUMMARY	2PFLWVP	3	13 Watt Plug-In CFL 2-Lamp With Patch Fixture	26	0.064	670	734	3	R-2PFL-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.035	6,735	\$	334	419
58	BLDG 30	EXTERIOR	EXTERIOR	2PFL1DCPY	2	13 Watt Plug-In CFL 2-Lamp Canopy Fixture	26	0.059	875	495	2	R-2PFL-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.024	8,731	\$	210	286
59	BLDG 2	INTERIOR	SUMMARY	2W025	16	T8 14-Lamp 2-Lamp 035 Core Fixture with 25 Watt 4-Lamps	43	0.098	2810	1,904	16	R-2L-LED	Re-lamp with (2) 13.5 Watt LED T8 4-Lamp, Check Wire to Socket	25	0.400	2,890	\$	1,144	1,234
60	BLDG 2	INTERIOR	SUMMARY	2PFL1DC	6	13 Watt Plug-In CFL recessed Fixture	26	0.224	2810	641	6	R-2PFL-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.094	2,890	\$	275	306
61	BLDG 2	INTERIOR	SUMMARY	1W117	11	T8 20-Lamp Vmp Fixture	22	0.242	2800	602	11	R-1L-LED	Re-lamp with (1) 10 Watt LED T8 2-Lamp, Check Wire to Socket	10	0.110	2,699	\$	355	376
62	BLDG 2	INTERIOR	SUMMARY	20025	1	T8 14-Lamp 035 Core Fixture with 25 Watt 4-Lamps	43	0.040	2800	123	1	R-2L-LED	Re-lamp with (2) 13.5 Watt LED T8 4-Lamp, Check Wire to Socket	25	0.025	2,800	\$	72	81
63	BLDG 2	INTERIOR	SUMMARY	1W117	1	T8 20-Lamp Vmp Fixture	22	0.022	2800	60	1	R-1L-LED	Re-lamp with (1) 10 Watt LED T8 2-Lamp, Check Wire to Socket	10	0.010	2,800	\$	25	34
64	BLDG 2	INTERIOR	SUMMARY	1W025	13	T8 14-Lamp Vmp Fixture with 25 Watt 4-Lamps	22	0.216	2810	418	13	R-1L-LED	Re-lamp with (1) 13.5 Watt LED T8 4-Lamp, Check Wire to Socket	12.5	0.193	2,698	\$	405	363
65	BLDG 2	EXTERIOR	EXTERIOR	2PFLWVP	1	24 Watt Plug-In CFL 2-Lamp With Patch Fixture	36	0.056	2800	199	1	R-2PFL-LED	Re-Lamp with (2) 11 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	26	0.029	2,698	\$	74	92
66	BLDG 2	EXTERIOR	EXTERIOR	2PFLWVP	3	13 Watt Plug-In CFL 2-Lamp With Patch Fixture	26	0.064	2800	240	3	R-2PFL-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.026	2,698	\$	103	137
67	BLDG 2	INTERIOR	SUMMARY	2W025	10	T8 14-Lamp Vmp Fixture with 25 Watt 4-Lamps	43	0.430	2800	1,200	10	R-2L-LED	Re-lamp with (2) 13.5 Watt LED T8 4-Lamp, Check Wire to Socket	25	0.250	2,698	\$	715	815
68	BLDG 2	INTERIOR	SUMMARY	2PFL1DC	2	13 Watt Plug-In CFL Drum Fixture	26	0.056	2800	150	2	R-2PFL-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.024	2,698	\$	60	82
69	BLDG 2	INTERIOR	SUMMARY	2PFL1DC	8	13 Watt Plug-In CFL recessed Fixture	26	0.224	2800	641	8	R-2PFL-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.033	2,698	\$	275	305
70	BLDG 2	INTERIOR	SUMMARY	0P13	4	13 Watt Compact Fluorescent Fixture	13	0.022	2800	149	4	LED 18A	Re-Lamp with (4) 10 Watt LED A19	10	0.040	2,698	\$	114	34
71	BLDG 2	INTERIOR	SUMMARY	100A	2	100 Watt Fluorescent 4-Lamp Fixture	100	0.300	2800	572	2	LED 18A	Re-Lamp with (2) 10 Watt LED A19	16	0.026	2,698	\$	103	496
72	BLDG 3	INTERIOR	SUMMARY	1W025	1	T8 14-Lamp Vmp Fixture with 25 Watt 4-Lamps	22	0.022	0	0	1	R-1L-LED	Re-lamp with (1) 13.5 Watt LED T8 4-Lamp, Check Wire to Socket	12.5	0.010	0	\$	0	0
73	BLDG 3	INTERIOR	SUMMARY	3W025	40	T8 14-Lamp 035 Core Fixture with 25 Watt 4-Lamps	65	2.195	0	0	40	R-2L-LED	Re-lamp with (2) 13.5 Watt LED T8 4-Lamp, Check Wire to Socket	37.5	1.913	0	\$	0	0
74	BLDG 3	INTERIOR	SUMMARY	2PFL1DC	6	13 Watt Plug-In CFL recessed Fixture	26	0.195	0	0	6	R-2PFL-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.072	0	\$	0	0
75	BLDG 3	INTERIOR	SUMMARY	2PFL1DC	1	13 Watt Plug-In CFL Drum Fixture	26	0.028	0	0	1	R-2PFL-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.012	0	\$	0	0
76	BLDG 3	EXTERIOR	EXTERIOR	2PFLWVP	12	13 Watt Plug-In CFL 2-Lamp With Patch Fixture	26	0.316	0	0	12	R-2PFL-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.144	0	\$	0	0
77	BLDG 3	EXTERIOR	EXTERIOR	2PFL1DCPY	6	13 Watt Plug-In CFL 2-Lamp Canopy Fixture	26	0.140	0	0	6	R-2PFL-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.090	0	\$	0	0
78	BLDG 3	EXTERIOR	EXTERIOR	2PFLWVP	2	24 Watt Plug-In CFL 2-Lamp With Patch Fixture	36	0.110	0	0	2	R-2PFL-LED	Re-Lamp with (2) 11 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	26	0.022	0	\$	0	0
79	BLDG 3	EXTERIOR	EXTERIOR	MH00TD	1	150 Watt Metal Halide Double Quartz Fixture	150	0.140	0	0	1	M-LED00BY	New 24 Watt LED Double Quartz Emergency Fixture	26	0.026	0	\$	0	0
80	BLDG 3	INTERIOR	BASEMENT	4C025	1	T8 14-Lamp 035 Core Fixture with 25 Watt 4-Lamps	65	0.095	0	0	1	R-4L-LED	Re-lamp with (4) 13.5 Watt LED T8 4-Lamp, Check Wire to Socket	50	0.050	0	\$	0	0
81	BLDG 3	INTERIOR	DAGENONT	2C025	1	T8 14-Lamp 035 Core Fixture with 25 Watt 4-Lamps	43	0.040	0	0	1	R-2L-LED	Re-lamp with (2) 13.5 Watt LED T8 4-Lamp, Check Wire to Socket	25	0.025	0	\$	0	0
82	BLDG 3	INTERIOR	DAGENONT	1W025	3	T8 14-Lamp Vmp Fixture with 25 Watt 4-Lamps	22	0.098	0	0	3	R-1L-LED	Re-lamp with (3) 13.5 Watt LED T8 4-Lamp, Check Wire to Socket	12.5	0.036	0	\$	0	0
83	BLDG 3	INTERIOR	DAGENONT	2W025	1	T8 14-Lamp Vmp Fixture with 25 Watt 4-Lamps	43	0.040	0	0	1	R-2L-LED	Re-lamp with (2) 13.5 Watt LED T8 4-Lamp, Check Wire to Socket	25	0.025	0	\$	0	0
84	BLDG 9	INTERIOR	SUMMARY	1W025	30	T8 14-Lamp Vmp Fixture with 25 Watt 4-Lamps	22	0.792	2800	2,208	30	R-1L-LED	Re-lamp with (3) 13.5 Watt LED T8 4-Lamp, Check Wire to Socket	12.5	0.400	2,190	\$	1,287	978

PRELIMINARY AUDIT

EXISTING FEATURES

PROPOSED FEATURE UPGRADE

ID #	Facility Name	Phase	Room Description	EDW Code	Qty	Description	Watts	KW	Per Burn Hours	Wth	Qty	Watt Code	Description	Watts	KW	KW Saved	Per Burn Hours	Wth	KWh Saved	
86	BLDG 3	INTERIOR	SUMMARY	4L25	44	78 2x4 Lamp Troffer Fixture with 25 Watt T Lamps	65	3.740	2660	10,609	44	R-4L-12ALD	Re-Lamp with (4) 12.5 Watt LED T8 4 Lamps, Direct Wire to Socket	50	2.200	1,540	\$	2,650	6,292	4,654
87	BLDG 3	INTERIOR	SUMMARY	ZC035	56	78 1x4 Lamp Edge Chase Fixture with 25 Watt T Lamps	43	2.384	2960	7,133	56	R-2L-12ALD	Re-Lamp with (2) 12.5 Watt LED T8 4 Lamps, Direct Wire to Socket	25	1,450	1,044	\$	2,950	4,147	2,196
88	BLDG 3	INTERIOR	SUMMARY	4C025	12	78 1x4 Lamp Edge Chase Fixture with 25 Watt T Lamps	40	1,020	2860	2,917	12	R-4L-12ALD	Re-Lamp with (4) 12.5 Watt LED T8 4 Lamps, Direct Wire to Socket	50	0,400	0,420	\$	2,940	1,716	1,201
89	BLDG 3	INTERIOR	SUMMARY	40A	10	10 Watt Incandescent Lamp Fixture	60	0,600	2960	1,716	10	LED 10A	Re-Lamp with (1) 10 Watt LED A19	10	0,100	0,050	\$	2,860	205	1,493
90	BLDG 3	INTERIOR	SUMMARY	CF20R02L	38	20 Watt Compact Fluorescent Downlight Fixture	20	0,710	2960	2,174	38	LED 10A	Re-Lamp with (1) 10 Watt LED A19	10	0,340	0,380	\$	2,850	1,097	1,907
91	BLDG 3	INTERIOR	SUMMARY	ZFL1DR	18	13 Watt Compact Fluorescent Plafier	25	4,504	2660	1,441	18	R-2FL-ALD	Re-Lamp with (2) 8 Watt LED Plafier Lamps, Existing CFL, Existing Trimless	12	0,215	0,281	\$	2,850	615	824
92	BLDG 3	INTERIOR	SUMMARY	2W25	574	78 1x4 Lamp Troffer Fixture with 25 Watt T Lamps	40	24,962	2960	70,021	574	R-2L-12ALD	Re-Lamp with (2) 12.5 Watt LED T8 4 Lamps, Direct Wire to Socket	25	14,550	10,332	\$	2,940	41,941	20,650
93	BLDG 3	INTERIOR	SUMMARY	CF13DFY	10	13 Watt Compact Fluorescent Ceiling Fixture	13	0,130	2960	372	10	LED 10A	Re-Lamp with (1) 10 Watt LED A19	10	0,100	0,030	\$	2,800	266	615
94	BLDG 3	INTERIOR	SUMMARY	1W17	18	78 2x2 1-Lamp Troffer Fixture	22	0,396	2660	1,133	18	R-1L-10LEDZ	Re-Lamp with (1) 10 Watt LED T8 2 Lamps, Direct Wire to Socket	10	0,190	0,216	\$	2,800	815	918
95	BLDG 3	INTERIOR	SUMMARY	AV25	20	78 1x4 Lamp Troffer Fixture with 25 Watt T Lamps	40	1,700	2660	4,662	20	R-4L-12ALD	Re-Lamp with (4) 12.5 Watt LED T8 4 Lamps, Direct Wire to Socket	50	1,600	0,700	\$	2,860	2,860	2,022
96	BLDG 3	INTERIOR	SUMMARY	CF13	14	13 Watt Compact Fluorescent Plafier	13	0,192	2660	521	14	LED 10A	Re-Lamp with (1) 10 Watt LED A19	10	0,140	0,042	\$	2,650	400	120
97	BLDG 3	INTERIOR	SUMMARY	ZFL1DR	16	13 Watt Fluorescent CFL Troffer Plafier	24	0,354	2660	1,441	16	R-2FL-ALD	Re-Lamp with (2) 8 Watt LED Plafier Lamps, Existing CFL, Existing Trimless	12	0,215	0,268	\$	2,850	615	824
98	BLDG 3	INTERIOR	SUMMARY	69R2D-01M	30	69 Watt Incandescent Plafier or Downlight Fixture, Existing	60	2,340	2660	6,002	30	LED 10R2D03	Re-Lamp with (3) 10 Watt LED R2D03	10	0,350	1,000	\$	2,650	1,000	6,003
99	BLDG 3	EXTERIOR	SUMMARY	Z525-3T	2	78 1x2 2-Lamp Recessed Plafier	48	0,091	2660	260	2	R-2L-12LEDZ	Re-Lamp with (2) 12.5 Watt LED T8 4 Lamps, Existing CFL, Existing Trimless	24	0,046	0,050	\$	2,650	137	143
100	BLDG 3	INTERIOR	QUEST HOUSING	ZFL2SWP	4	26 Watt Plafier CFL 2-Lamp with Plafier Fixture	66	0,222	2660	664	4	R-2FL-1LED	Re-Lamp with (2) 11 Watt LED Plafier Lamps, Existing CFL, Existing Trimless	26	0,104	0,128	\$	2,860	267	395
101	BLDG 3	INTERIOR	QUEST HOUSING	1W17	20	78 2x2 1-Lamp Troffer Fixture	22	0,440	0	0	20	R-1L-10LEDZ	Re-Lamp with (1) 10 Watt LED T8 2 Lamps, Direct Wire to Socket	10	0,200	0,240	\$	0	0	0
102	BLDG 3	INTERIOR	SUMMARY	1W25	16	78 1x4 Lamp Troffer Fixture with 25 Watt T Lamps	22	0,322	0	0	16	R-1L-12ALD	Re-Lamp with (1) 12.5 Watt LED T8 4 Lamps, Direct Wire to Socket	12.5	0,200	0,152	\$	0	0	0
103	BLDG 3	INTERIOR	SUMMARY	1W25	4	78 1x4 Lamp Troffer Fixture with 25 Watt T Lamps	22	0,048	0	0	4	R-1L-12ALD	Re-Lamp with (1) 12.5 Watt LED T8 4 Lamps, Direct Wire to Socket	12.5	0,050	0,039	\$	0	0	0
104	BLDG 3	INTERIOR	SUMMARY	1W17	18	78 2x2 1-Lamp Troffer Fixture	22	0,396	0	0	18	R-1L-10LEDZ	Re-Lamp with (1) 10 Watt LED T8 2 Lamps, Direct Wire to Socket	10	0,180	0,210	\$	0	0	0
105	BLDG 3	INTERIOR	SUMMARY	ZFL1DR	8	13 Watt Plafier CFL 2-Lamp with Plafier Fixture	28	0,224	0	0	8	R-2FL-ALD	Re-Lamp with (2) 8 Watt LED Plafier Lamps, Existing CFL, Existing Trimless	12	0,020	0,128	\$	0	0	0
106	BLDG 3	INTERIOR	SUMMARY	CF13	10	13 Watt Compact Fluorescent Plafier	13	0,130	0	0	10	LED 10A	Re-Lamp with (1) 10 Watt LED A19	10	0,100	0,050	\$	0	0	0
107	BLDG 3	INTERIOR	SUMMARY	ZFL1DR	4	13 Watt Plafier CFL 2-Lamp with Plafier Fixture	28	0,112	0	0	4	R-2FL-ALD	Re-Lamp with (2) 8 Watt LED Plafier Lamps, Existing CFL, Existing Trimless	12	0,048	0,064	\$	0	0	0
108	BLDG 3	INTERIOR	SUMMARY	ZC025	2	78 1x4 Lamp Edge Chase Fixture with 25 Watt T Lamps	43	0,069	0	0	2	R-2L-12ALD	Re-Lamp with (2) 12.5 Watt LED T8 4 Lamps, Existing CFL, Existing Trimless	25	0,050	0,006	\$	0	0	0
109	BLDG 3	INTERIOR	SUMMARY	ZFL1DR	72	13 Watt Plafier CFL 2-Lamp with Plafier Fixture	28	2,016	0	0	72	R-2FL-ALD	Re-Lamp with (2) 8 Watt LED Plafier Lamps, Existing CFL, Existing Trimless	12	0,064	1,132	\$	0	0	0
110	BLDG 3	INTERIOR	SUMMARY	1W17	15	78 2x2 1-Lamp Troffer Fixture	22	0,302	0	0	15	R-1L-10LEDZ	Re-Lamp with (1) 10 Watt LED T8 2 Lamps, Direct Wire to Socket	10	0,160	0,102	\$	0	0	0
111	BLDG 3	INTERIOR	SUMMARY	2W25	12	78 1x4 Lamp Troffer Fixture with 25 Watt T Lamps	40	0,316	0	0	12	R-2L-12ALD	Re-Lamp with (2) 12.5 Watt LED T8 4 Lamps, Existing CFL, Existing Trimless	25	0,300	0,216	\$	0	0	0
112	BLDG 3	INTERIOR	OCCUPIED OFFICES	1W25	20	78 1x4 Lamp Troffer Fixture with 25 Watt T Lamps	22	0,440	0	0	20	R-1L-12ALD	Re-Lamp with (1) 12.5 Watt LED T8 4 Lamps, Existing CFL, Existing Trimless	12.5	0,250	0,190	\$	0	0	0

PRELIMINARY AUDIT

EXISTING FIXTURES

PROPOSED FUTURE UPGRADE

ID #	Facility Name	Phase	Room Description	ES&M Code	Qty	Description	Volts	KW	Pre Burn Hours	Wth	Qty	New Code	Description	Volts	KW	KV Saved	KV Cost Savings	Post Burn Hours	Wth	Wth Saved
113	BLDG 13	INTERIOR	OCCUPIED OFFICE	1W17	6	T8 32-1 Lamp Vmp Fluore	22	0.176	0	0	6	R 11-10LEDZ	Re-lamp with (1) 10 Watt LED T8 2' Lamp, Direct Wire to Socket	10	0.099	0.086	\$ -	0	0	0
114	BLDG 13	INTERIOR	OCCUPIED OFFICE	2PULDR	64	13 Watt Plug-in CFL 2-Lamp Wall Pack Fluore	26	1.730	0	0	64	R 2P-4LED	Re-Lamp with (2) 9 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.759	1.024	\$ -	0	0	0
115	BLDG 13	EXTERIOR	EXTERIOR	2PULSWP	96	13 Watt Plug-in CFL 2-Lamp Wall Pack Fluore	26	2.988	0	0	96	R 2P-4LED	Re-Lamp with (2) 9 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	1.132	1.634	\$ -	0	0	0
116	BLDG 13	EXTERIOR	EXTERIOR	2PULSWP	24	20 Watt Plug-in CFL 2-Lamp Wall Pack Fluore	58	1.330	0	0	24	R 2P-4-1LED	Re-Lamp with (2) 11 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	26	0.924	0.799	\$ -	0	0	0
117	BLDG 8	INTERIOR	SUMMARY	4W25	12	T8 14-2 Lamp Vmp Fluore with 25 Watt 4' Lamps	65	1.020	2600	2,917	12	R 4-12-LED	Re-lamp with (4) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	50	0.620	0.420	\$ -	2,650	1,776	1,201
118	BLDG 6	INTERIOR	SUMMARY	2PULDR	4	13 Watt Plug-in CFL 2-Lamp Fluore	26	0.512	2600	320	4	R 2P-4LED	Re-Lamp with (2) 9 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.694	0.694	\$ -	2,600	137	183
119	BLDG 6	INTERIOR	SUMMARY	2PULDR	4	13 Watt Plug-in CFL 2-Lamp Fluore	26	0.512	2600	320	4	R 2P-4LED	Re-Lamp with (2) 9 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.694	0.694	\$ -	2,600	137	183
120	BLDG 6	INTERIOR	SUMMARY	1W25	4	T8 14-2 Lamp Vmp Fluore with 25 Watt 4' Lamps	22	0.505	2600	262	4	R 11-12-LED	Re-lamp with (1) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	12.5	0.626	0.626	\$ -	2,600	143	109
121	BLDG 6	INTERIOR	SUMMARY	1W17	6	T8 32-1 Lamp Vmp Fluore	22	0.176	2600	600	6	R 11-10LEDZ	Re-lamp with (1) 10 Watt LED T8 2' Lamps, Direct Wire to Socket	10	0.099	0.099	\$ -	2,600	228	275
122	BLDG 8	EXTERIOR	EXTERIOR	2PULSWP	16	20 Watt Plug-in CFL 2-Lamp Wall Pack Fluore	58	0.828	2600	2,664	16	R 2P-4-1LED	Re-Lamp with (2) 11 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	26	0.646	0.622	\$ -	2,600	1,130	1,464
123	BLDG 8	EXTERIOR	EXTERIOR	2PULDR	16	13 Watt Plug-in CFL 2-Lamp Copy Fluore	26	0.449	2600	1,391	16	R 2P-4LED	Re-Lamp with (2) 9 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.192	0.259	\$ -	2,600	540	702
124	BLDG 8	EXTERIOR	EXTERIOR	MH0005LY	44	100 Watt Metal Halide Flood Light, 150'	100	47.740	2600	13,038	44	N LED038FL	New 500 Watt LED Flood Light	375	10.990	33.940	\$ -	2,600	30,640	94,607
125	BLDG 14	INTERIOR	SUMMARY	2025	32	T8 32-1 Lamp Vmp Fluore with 25 Watt 4' Lamps	43	1.376	6000	7,012	32	R 2L-12-LED	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	25	0.800	0.570	\$ -	6,000	4,877	2,035
126	BLDG 14	INTERIOR	SUMMARY	2N025	48	T8 14-2 Lamp Vmp Fluore with 25 Watt 4' Lamps	43	2.964	6000	10,818	48	R 2L-12-LED	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	25	1.200	0.864	\$ -	6,000	6,115	4,480
127	BLDG 14	INTERIOR	SUMMARY	1V26	4	T8 14-2 Lamp Vmp Fluore with 25 Watt 4' Lamps	22	0.509	6000	446	4	R 11-12-LED	Re-lamp with (1) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	12.5	0.620	0.620	\$ -	6,000	295	194
128	BLDG 14	INTERIOR	SUMMARY	21L25	8	T8 14-2 Lamp Troller Fluore with 25 Watt 4' Lamps	43	0.344	1000	1,703	8	R 2L-13-LED	Re-lamp with (2) 13 Watt LED T8 4' Lamps, Direct Wire to Socket	25	0.620	0.144	\$ -	6,000	1,019	704
129	BLDG 14	INTERIOR	SUMMARY	CP13	12	13 Watt Compact Fluorescent Fluore	13	0.195	1000	766	12	LED 10A	Re-Lamp with (1) 10 Watt LED A10	10	0.120	0.209	\$ -	6,000	612	103
130	BLDG 14	INTERIOR	SUMMARY	1W17	6	T8 32-1 Lamp Vmp Fluore	22	0.132	1000	673	0	R 11-10LEDZ	Re-lamp with (1) 10 Watt LED T8 2' Lamps, Direct Wire to Socket	10	0.090	0.072	\$ -	6,000	308	367
131	BLDG 14	INTERIOR	SUMMARY	4L25	108	T8 24-4 Lamp Troller Fluore with 25 Watt 4' Lamps	43	0.190	1000	46,791	108	R 4L-13-LED	Re-lamp with (4) 13 Watt LED T8 4' Lamps, Direct Wire to Socket	50	5.400	3.760	\$ -	6,000	22,918	10,200
132	BLDG 14	INTERIOR	SUMMARY	2PULDR	96	13 Watt Plug-in CFL 2-Lamp Fluore	26	2.081	1000	13,608	96	R 2P-4LED	Re-Lamp with (2) 9 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	1.162	1.535	\$ -	6,000	5,871	7,827
133	BLDG 14	INTERIOR	SUMMARY	21L25	120	T8 14-2 Lamp Troller Fluore with 25 Watt 4' Lamps	43	0.190	1000	26,300	120	R 2L-12-LED	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	25	3.000	2.160	\$ -	6,000	15,268	11,007
134	BLDG 14	INTERIOR	SUMMARY	1W17	12	T8 32-1 Lamp Vmp Fluore	22	0.204	1000	1,346	12	R 11-10LEDZ	Re-lamp with (1) 10 Watt LED T8 2' Lamps, Direct Wire to Socket	10	0.120	0.144	\$ -	6,000	612	704
135	BLDG 14	INTERIOR	SUMMARY	2PULDR	72	13 Watt Plug-in CFL 2-Lamp Fluore	26	2.076	1000	10,274	72	R 2P-4LED	Re-Lamp with (2) 9 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.664	1.182	\$ -	6,000	4,400	6,071
136	BLDG 14	INTERIOR	SUMMARY	RC25	36	T8 24-4 Lamp Troller Fluore with 25 Watt 4' Lamps	128	4.699	1000	23,492	36	R 4L-12-LED	Re-lamp with (4) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	75	2.700	1.000	\$ -	6,000	13,780	8,729
137	BLDG 14	INTERIOR	GYM	4H054	24	T8H0 24-4 Lamp High Bay Fluore	241	5.784	6000	20,470	24	N LED094H	New 05 Watt LED High Bay Fluore	50	2.202	3.502	\$ -	6,000	11,374	18,101
138	BLDG 14	INTERIOR	GYM	4L26	8	T8 24-4 Lamp Troller Fluore with 25 Watt 4' Lamps	95	0.570	1000	2,500	8	R 4L-12-LED	Re-lamp with (4) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	50	0.900	0.210	\$ -	6,000	1,029	1,070
139	BLDG 14	INTERIOR	BASEMENT	1W17	24	T8 32-1 Lamp Vmp Fluore	22	0.528	1000	2,901	24	R 11-10LEDZ	Re-lamp with (1) 10 Watt LED T8 2' Lamps, Direct Wire to Socket	10	0.240	0.296	\$ -	6,000	1,223	1,406
140	BLDG 14	INTERIOR	BASEMENT	2025	42	T8 14-2 Lamp Vmp Fluore with 25 Watt 4' Lamps	43	1.406	6000	9,203	42	R 2L-12-LED	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	25	1.000	0.758	\$ -	6,000	5,291	3,993

PRELIMINARY AUDIT

EXISTING FEATURES

PROPOSED FEATURE UPGRADE

ID #	Facility Name	Phase	Room Description	ECM Code	Qty	Description	Watts	KW	Pk Bldg Hours	W/W	Qty	New Code	Description	Width	W/F	KW Saved	KV Cost Savings	Peak Bldg Hours	W/W	KWH Saved	
160	BLDG 2K	EXTERIOR	EXTERIOR	2PL3WVP	2	13 Watt Plug-In CFL 3-Lamp with 25' Wire 4' Lamps	29	0.036	2900	160	2	R-2P-3ALCD	Re-Lamp with (2) 4 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.024	0.032	\$ -	2,900	69	12	0.024
170	BLDG 6A7	INTERIOR	SUMMARY	21L2S	2	T8 14-2-Lamp T8er Fixture with 25' Wire 4' Lamps	43	0.059	6736	701	2	R-2L-12ALCD	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	20	0.030	0.039	\$ -	6,736	437	20	0.030
171	BLDG 6A7	INTERIOR	LOBBY	21L2S	2	T8 14-2-Lamp T8er Fixture with 25' Wire 4' Lamps	43	0.059	6736	701	2	R-2L-12ALCD	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	20	0.030	0.039	\$ -	6,736	437	20	0.030
172	BLDG 6A7	INTERIOR	HALL	21L2S	2	T8 14-2-Lamp T8er Fixture with 25' Wire 4' Lamps	43	0.059	6736	701	2	R-2L-12ALCD	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	20	0.030	0.039	\$ -	6,736	437	20	0.030
173	BLDG 6A7	INTERIOR	HALL	2E02S	36	T8 14-2-Lamp 2-Prk Core Fixture with 25' Wire 4' Lamps	43	1.604	4736	14,276	36	R-2L-12ALCD	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	20	0.030	0.064	\$ -	4,736	8,209	36	0.030
174	BLDG 6A7	INTERIOR	SUMMARY	1W02S	2	T8 14-2-Lamp Wire Fixture with 25' Wire 4' Lamps	22	0.044	6720	364	2	R-1L-12ALCD	Re-lamp with (1) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	12.5	0.025	0.010	\$ -	6,720	216	2	0.025
175	BLDG 6A7	INTERIOR	SUMMARY	1W17	4	T8 14-2-Lamp Vandy Fixture with 25' Wire 4' Lamps	22	0.065	6756	750	4	R-1L-10LEDZ	Re-lamp with (1) 10 Watt LED T8 2' Lamps, Direct Wire to Socket	10	0.040	0.048	\$ -	6,756	340	4	0.040
176	BLDG 6A7	INTERIOR	SUMMARY	4B0	10	40 Watt Incandescent Compact Fluor	40	0.400	6736	3,604	10	LED 6CAND	Re-Lamp with (1) 9 Watt LED Compact Fluor	5	0.050	0.250	\$ -	6,736	437	10	0.050
177	BLDG 6A7	INTERIOR	SUMMARY	2V02S	10	T8 14-2-Lamp Wire Fixture with 25' Wire 4' Lamps	29	0.330	4736	3,796	10	R-2L-12ALCD	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	20	0.250	0.140	\$ -	6,736	2,164	10	0.250
178	BLDG 6A7	INTERIOR	SUMMARY	2PL3WVP	10	13 Watt Plug-In CFL 3-Lamp with 25' Wire 4' Lamps	29	0.330	6726	2,530	10	R-3P-3ALCD	Re-lamp with (2) 3 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.144	0.152	\$ -	6,736	1,268	10	0.144
179	CM2	INTERIOR	SUMMARY	2L2S	2	T8 14-2-Lamp T8er Fixture with 25' Wire 4' Lamps	43	0.059	3500	301	2	R-2L-12ALCD	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	20	0.030	0.031	\$ -	3,500	175	2	0.030
180	CM2	INTERIOR	SUMMARY	2PL15SC	12	13 Watt Plug-In CFL 3-Lamp with 25' Wire 4' Lamps	29	0.330	3500	1,170	12	R-3P-3ALCD	Re-lamp with (2) 3 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.144	0.152	\$ -	3,500	504	12	0.144
181	CM2	INTERIOR	SUMMARY	2PL10DR	2	13 Watt Plug-In CFL 3-Lamp with 25' Wire 4' Lamps	29	0.059	3500	301	2	R-3P-3ALCD	Re-lamp with (2) 3 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.054	0.052	\$ -	3,500	64	2	0.054
182	CM2	INTERIOR	SUMMARY	2V12S	2	T8 14-2-Lamp Vandy Fixture with 25' Wire 4' Lamps	43	0.059	3500	301	2	R-2L-12ALCD	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	20	0.050	0.026	\$ -	3,500	175	2	0.050
183	CM2	INTERIOR	SUMMARY	1W17	6	T8 14-2-Lamp Vandy Fixture with 25' Wire 4' Lamps	22	0.176	3500	916	6	R-1L-10LEDZ	Re-lamp with (1) 10 Watt LED T8 2' Lamps, Direct Wire to Socket	10	0.080	0.056	\$ -	3,500	290	6	0.080
184	CM2	INTERIOR	SUMMARY	CF02L	4	13 Watt Compact Fluorescent Downlight Fixture	13	0.052	3500	162	4	Z2 D0	No Retrofit	13	0.082	0.080	\$ -	3,500	162	4	0.082
185	CM2	INTERIOR	SUMMARY	1W17	4	T8 14-2-Lamp Vandy Fixture with 25' Wire 4' Lamps	22	0.059	3500	306	4	R-1L-10LEDZ	Re-lamp with (1) 10 Watt LED T8 2' Lamps, Direct Wire to Socket	10	0.040	0.048	\$ -	3,500	140	4	0.040
186	CM2	INTERIOR	SUMMARY	695C	8	10 Watt Incandescent Downlight Fixture	60	0.660	3500	1,090	8	LED 10A	Re-Lamp with (1) 10 Watt LED 4'10"	10	0.080	0.400	\$ -	3,500	250	8	0.080
187	CM2	INTERIOR	SUMMARY	21L2S	2	T8 14-2-Lamp T8er Fixture with 25' Wire 4' Lamps	43	0.059	3500	301	2	R-2L-12ALCD	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	20	0.050	0.035	\$ -	3,500	175	2	0.050
188	CM2	INTERIOR	SUMMARY	2C02S	6	T8 14-2-Lamp 2-Prk Core Fixture with 25' Wire 4' Lamps	43	0.298	3500	903	6	R-2L-12ALCD	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	20	0.190	0.105	\$ -	3,500	425	6	0.190
189	CM2	INTERIOR	SUMMARY	CF13	2	13 Watt Compact Fluorescent Fixture	13	0.130	3500	463	2	LED 10A	Re-Lamp with (1) 10 Watt LED 4'10"	10	0.090	0.076	\$ -	3,500	210	2	0.090
190	CM2	INTERIOR	SUMMARY	2PL3WVP	4	13 Watt Plug-In CFL 3-Lamp with 25' Wire 4' Lamps	29	0.112	3500	362	4	R-3P-3ALCD	Re-Lamp with (2) 3 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.046	0.044	\$ -	3,500	198	4	0.046
191	CM2	INTERIOR	SUMMARY	CF13	2	13 Watt Compact Fluorescent Fixture	13	0.020	3500	91	2	LED 10A	Re-Lamp with (1) 10 Watt LED 4'10"	10	0.020	0.020	\$ -	3,500	70	2	0.020
192	CM2	INTERIOR	SUMMARY	4C02S	16	T8 14-2-Lamp 2-Prk Core Fixture with 25' Wire 4' Lamps	43	1.360	3900	4,768	16	R-4L-12ALCD	Re-lamp with (4) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	50	0.800	0.560	\$ -	3,900	2,000	16	0.800
193	CM2	INTERIOR	SUMMARY	2V12S	4	T8 14-2-Lamp Vandy Fixture with 25' Wire 4' Lamps	43	0.172	3600	692	4	R-2L-12ALCD	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	20	0.100	0.072	\$ -	3,600	360	4	0.100
194	CM2	INTERIOR	SUMMARY	2PL10DR	4	13 Watt Plug-In CFL 3-Lamp with 25' Wire 4' Lamps	29	0.112	3500	392	4	R-3P-3ALCD	Re-Lamp with (2) 3 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.048	0.044	\$ -	3,500	198	4	0.048
195	CM2	INTERIOR	SUMMARY	1W17	72	T8 14-2-Lamp Vandy Fixture with 25' Wire 4' Lamps	22	1.584	3500	5,448	72	R-1L-10LEDZ	Re-lamp with (1) 10 Watt LED T8 2' Lamps, Direct Wire to Socket	10	0.070	0.064	\$ -	3,500	2,228	72	0.070
196	CM2	INTERIOR	SUMMARY	2325SFT	16	T8 14-2-Lamp 2-Prk Core Fixture with 25' Wire 4' Lamps	49	0.794	3500	2,744	16	R-2L-12ALCD	Re-lamp with (2) 12.5 Watt LED T8 4' Lamps, Direct Wire to Socket	24	0.344	0.400	\$ -	3,500	1,344	16	0.344

PRELIMINARY AUDIT

EXISTING FIXTURES

PROPOSED FIXTURE UPGRADE

ID #	Facility Name	Phase	Room Description	Base Code	Qty	Description	Watts	KW	Prk Bm Hours	WtH	City	Item Code	Description	Watts	KW	KW/Room	Prk Bm Hours	WtH	KWh Saved
197	CH-2	INTERIOR	SUMMARY	20020	16	T8 14 2-Lamp Egg Case Fixture with 25 Watt 4' Lamp	43	0.698	3600	2,485	16	R-2L-12-LED	Recess with (2) 12.5 Watt LED T8 4' Lamp, Direct Wire to Socket	20	0.400	0.298	3,600	1,400	1,089
199	CH-2	INTERIOR	SUMMARY	CF1300DL	110	13 Watt Compact Fluorescent Square Downlight Fixture	13	1.506	3600	1,528	119	Z2-D0	No Retrofit	13	1.528	0.000	3,600	1,528	0
198	CH-2	INTERIOR	SUMMARY	4020	128	T8 14 2-Lamp V-Wrap Fixture with 25 Watt 4' Lamp	46	10.880	3600	26,890	129	R-4L-12-LED	Retrofit with (8) 12.5 Watt LED T8 4' Lamp, Direct Wire to Socket	60	6.400	4.480	3,600	22,400	15,669
200	CH-4	INTERIOR	NURSE STATION	20020	32	T8 14 2-Lamp Egg Case Fixture with 25 Watt 4' Lamp	43	1.376	3600	4,919	32	R-2L-12-LED	Recess with (2) 12.5 Watt LED T8 4' Lamp, Direct Wire to Socket	26	0.600	0.779	3,600	2,800	2,979
201	CH-4	INTERIOR	JANITOR	CF13	36	13 Watt Compact Fluorescent Fixture	13	0.491	3600	1,636	36	LED 10A	Re-Lamp with (1) 10 Watt LED A19	16	0.300	0.109	3,600	1,360	376
202	CH-4	INTERIOR	OPEN PATIENT ROOM	3L01	32	T8 2x2 2-Lamp Troffer Fixture	65	2.080	3600	7,200	32	R-2L-12-LED	Recess with (2) 12.5 Watt LED T8 4' Lamp, Direct Wire to Socket	37.5	1.200	0.880	3,600	4,320	3,000
203	CH-4	INTERIOR	ROOM	1W17	12	T8 2x2 2-Lamp V-Wrap Fixture	22	0.294	3600	624	12	R-1L-10-LEDZ	Retrofit with (1) 10 Watt LED T8 2' Lamp, Direct Wire to Socket	19	0.120	0.144	3,600	420	564
204	CH-4	INTERIOR	ROOM	402C	4	60 Watt Incandescent Downlight Fixture	60	0.240	3600	860	4	LED 10A	Re-Lamp with (1) 10 Watt LED A10	19	0.600	0.200	3,600	140	700
205	CH-4	INTERIOR	OPEN PATIENT ROOM	2P-13DR	20	13 Watt Fluorescent CFL Down Fixture	26	0.360	3600	1,900	20	R-2P-6-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamp, Existing CFL, Existing Remains	12	0.240	0.120	3,600	660	1,120
206	CH-4	INTERIOR	RESTROOM	2-722	16	T8 14 2-Lamp V-Wrap Fixture	43	0.696	3600	2,408	16	R-2L-12-LED	Recess with (2) 12.5 Watt LED T8 4' Lamp, Direct Wire to Socket	26	0.400	0.284	3,600	1,420	1,008
207	CH-4	INTERIOR	RESTROOM	1V17	6	T8 2x2 2-Lamp V-Wrap Fixture	22	0.176	3600	616	6	R-1L-10-LEDZ	Retrofit with (1) 10 Watt LED T8 2' Lamp, Direct Wire to Socket	10	0.090	0.096	3,600	200	336
208	CH-4	INTERIOR	SHOWER	CF13DL	6	13 Watt Compact Fluorescent Downlight Fixture	13	0.104	3600	364	6	Z2-D0	No Retrofit	13	0.104	0.000	3,600	364	0
209	CH-4	INTERIOR	SHOWER	2P-13WVP	12	13 Watt Fluorescent CFL 2-Lamp V-Wrap Fixture	26	0.328	3600	1,176	12	R-2P-6-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamp, Existing CFL, Existing Remains	12	0.144	0.102	3,600	664	972
210	CH-4	INTERIOR	OPEN PATIENT ROOM	2P-13WVP	4	13 Watt Fluorescent CFL 2-Lamp V-Wrap Fixture	26	0.112	3600	392	4	R-2P-6-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamp, Existing CFL, Existing Remains	12	0.048	0.064	3,600	188	224
211	CH-4	INTERIOR	SOLARIUM / DAY ROOM	2-1L25	4	T8 14 2-Lamp Troffer Fixture with 25 Watt 4' Lamp	43	0.172	3600	602	4	R-2L-12-LED	Recess with (2) 12.5 Watt LED T8 4' Lamp, Direct Wire to Socket	20	0.100	0.072	3,600	300	202
212	CH-4	INTERIOR	OFFICE	20020	32	T8 14 2-Lamp Egg Case Fixture with 25 Watt 4' Lamp	43	1.376	3600	4,919	32	R-2L-12-LED	Recess with (2) 12.5 Watt LED T8 4' Lamp, Direct Wire to Socket	25	0.600	0.279	3,600	2,600	2,916
213	CH-4	INTERIOR	BED DEPT DAY ROOM	20020	4	T8 14 2-Lamp Egg Case Fixture with 25 Watt 4' Lamp	43	0.172	3600	602	4	R-2L-12-LED	Recess with (2) 12.5 Watt LED T8 4' Lamp, Direct Wire to Socket	20	0.100	0.072	3,600	300	282
214	BLDG 9 CH-6	INTERIOR	SUMMARY	2P-13WVP	36	13 Watt Fluorescent CFL 2-Lamp V-Wrap Fixture	26	1.008	6756	4,000	36	R-2P-6-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamp, Existing CFL, Existing Remains	12	0.420	0.179	6,756	3,774	5,002
215	BLDG 9 CH-6	INTERIOR	SUMMARY	40020	82	T8 14 2-Lamp Egg Case Fixture with 25 Watt 4' Lamp	85	4.420	6756	28,913	82	R-4L-12-LED	Recess with (8) 12.5 Watt LED T8 4' Lamp, Direct Wire to Socket	60	2.000	1.420	6,756	22,714	18,000
216	BLDG 9 CH-6	INTERIOR	SUMMARY	2P-13WC	16	13 Watt Fluorescent CFL 2-Lamp V-Wrap Fixture	26	0.448	6756	3,914	16	R-2P-6-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamp, Existing CFL, Existing Remains	12	0.102	0.259	6,756	1,077	2,200
217	BLDG 9 CH-6	INTERIOR	SUMMARY	1W17	4	T8 2x2 2-Lamp V-Wrap Fixture	22	0.304	6756	799	4	R-1L-10-LEDZ	Retrofit with (1) 10 Watt LED T8 2' Lamp, Direct Wire to Socket	19	0.040	0.048	6,756	349	479
218	BLDG 9 CH-6	INTERIOR	SUMMARY	1020	24	T8 14 2-Lamp Fluorescent Fixture with 25 Watt 4' Lamp	22	0.616	6756	6,381	24	R-1L-12-LED	Recess with (1) 12.5 Watt LED T8 4' Lamp, Direct Wire to Socket	12.5	0.350	0.296	6,756	3,088	2,224
219	BLDG 9 CH-6	INTERIOR	SUMMARY	1V17	4	T8 2x2 2-Lamp V-Wrap Fixture	22	0.396	6756	799	4	R-1L-10-LEDZ	Retrofit with (1) 10 Watt LED T8 2' Lamp, Direct Wire to Socket	10	0.040	0.048	6,756	349	479
220	BLDG 9 CH-6	INTERIOR	SUMMARY	20020	84	T8 14 2-Lamp Egg Case Fixture with 25 Watt 4' Lamp	43	4.042	6756	30,311	84	R-2L-12-LED	Recess with (8) 12.5 Watt LED T8 4' Lamp, Direct Wire to Socket	25	2.350	1.692	6,756	20,000	14,781
221	CH-7	INTERIOR	SUMMARY	20020	205	T8 14 2-Lamp Egg Case Fixture with 25 Watt 4' Lamp	43	11.436	3600	40,033	205	R-2L-12-LED	Recess with (8) 12.5 Watt LED T8 4' Lamp, Direct Wire to Socket	25	0.650	4.798	3,600	20,375	18,708
222	CH-7	INTERIOR	SUMMARY	2P-13DR	14	13 Watt Fluorescent CFL Down Fixture	26	0.054	3600	1,794	14	R-2P-6-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamp, Existing CFL, Existing Remains	12	0.216	0.254	3,600	796	1,008
223	CH-7	INTERIOR	SUMMARY	2-717	28	T8 2x2 2-Lamp V-Wrap Fixture	36	1.008	3600	3,028	28	R-2L-10-LEDZ	Retrofit with (2) 10 Watt LED T8 2' Lamp, Direct Wire to Socket	20	0.500	0.448	3,600	1,000	1,568
224	CH-7	INTERIOR	SUMMARY	2-17	152	T8 2x2 2-Lamp Troffer Fixture	36	5.472	3600	19,132	152	R-2L-10-LEDZ	Retrofit with (2) 10 Watt LED T8 2' Lamp, Direct Wire to Socket	20	3.040	2.432	3,600	10,640	8,912

PRELIMINARY AUDIT

EXISTING FEATURES

PROPOSED FEATURE UPGRADE

ID #	Facility Name	Phase	Room Description	ECM Code	Qty	Description	Watts	KV	Per Term Footcandle	KWh	Qty	New Code	Description	Watts	KV	KV Saved	Post Start Hours	KWh	KWh Saved
225	CM-7	INTERIOR	SUMMARY	CF13	6	13 Watt Compact Fluorescent Fixture	13	0.078	3600	273	6	LED 10A	Re-Lamp with (1) 10 Watt LED A19 Lamp, Direct View to Socket	10	0.060	0.016	3,000	210	03
226	CM-7	INTERIOR	SUMMARY	1W25	46	75 Watt 4-Lamp Vario Fluorescent with 25 Watt 4 Lamps	22	1.032	3600	1,647	46	R-1L-12-LED	Re-lamp with (1) 10-Watt LED T8 4 Lamps, Direct View to Socket	12.5	0.075	0.027	3,000	2,013	1,230
227	CM-7	INTERIOR	SUMMARY	1W17	12	T8 2x4 2-Lamp Troffer Fixture	22	0.294	3600	924	12	R-1L-10-LEDZ	Re-lamp with (1) 10-Watt LED T8 2 Lamps, Direct View to Socket	10	0.120	0.144	3,000	420	504
228	CM-7	INTERIOR	SUMMARY	EP22CHAND	4	25 Watt Compact Fluorescent 4-Lamp Chandelier Fixture	115	0.460	3600	1,010	4	ZZ 200	No Retrofit	115	0.460	0.000	3,000	1,010	0
229	CM-7	INTERIOR	SUMMARY	3L25	6	T8 1x4 2-Lamp Troffer Fixture with 20 Watt 4 Lamps	43	0.236	3600	960	6	R-2L-12-LED	Re-lamp with (2) 12-Watt LED T8 4 Lamps, Direct View to Socket	25	0.150	0.106	3,000	525	376
230	CM-7	INTERIOR	SUMMARY	3L17	4	T8 2x4 2-Lamp Troffer Fixture	56	0.232	3600	612	4	R-2L-10-LEDZ	Re-lamp with (2) 10-Watt LED T8 2 Lamps, Direct View to Socket	20	0.090	0.152	3,000	280	632
231	CM-7	INTERIOR	SUMMARY	2W125	2	T8 1x4 2-Lamp VapoLight Fixture	43	0.236	3600	301	2	R-2L-12-LED	Re-lamp with (2) 12-Watt LED T8 4 Lamps, Direct View to Socket	25	0.054	0.038	3,000	175	129
232	CM-7	INTERIOR	SUMMARY	CF10GOL	0	13 Watt Compact Fluorescent Square Downlight Fixture	13	0.078	3600	273	0	ZZ 200	No Retrofit	13	0.078	0.000	3,000	273	0
233	CM-7	INTERIOR	ELEVATOR	20W-FT	0	T8 1x4 2-Lamp Strip Fixture	49	0.234	3600	1,029	0	R-2L-10-LEDZ	Re-lamp with (2) 10-Watt LED T8 2 Lamps, Direct View to Socket	24	0.144	0.150	3,000	584	925
234	CM-4	INTERIOR	SUMMARY	2W23	16	T8 1x4 2-Lamp Vario Fluorescent with 25 Watt 4 Lamps	43	0.098	3600	2,408	16	R-2L-12-LED	Re-lamp with (2) 12-Watt LED T8 4 Lamps, Direct View to Socket	20	0.400	0.296	3,000	1,400	1,008
235	CM-4	INTERIOR	SUMMARY	20026	4	T8 1x4 2-Lamp Strip Fixture with 20 Watt 4 Lamps	43	0.172	3600	692	4	R-2L-12-LED	Re-lamp with (2) 12-Watt LED T8 4 Lamps, Direct View to Socket	25	0.100	0.072	3,000	330	262
236	CM-4	INTERIOR	SUMMARY	4W25	2	T8 1x4 2-Lamp Vario Fluorescent with 25 Watt 4 Lamps	85	0.170	3600	995	2	R-4L-12-LED	Re-lamp with (4) 12-Watt LED T8 4 Lamps, Direct View to Socket	50	0.100	0.070	3,000	350	246
237	CM-4	INTERIOR	SUMMARY	1W17	0	T8 2x4 2-Lamp Troffer Fixture	22	0.158	3600	603	0	R-1L-10-LEDZ	Re-lamp with (1) 10-Watt LED T8 2 Lamps, Direct View to Socket	10	0.080	0.106	3,000	315	378
238	CM-4	INTERIOR	SUMMARY	2L25	4	T8 1x4 2-Lamp Troffer Fixture with 20 Watt 4 Lamps	43	0.172	3600	692	4	R-2L-12-LED	Re-lamp with (2) 12-Watt LED T8 4 Lamps, Direct View to Socket	25	0.100	0.072	3,000	300	292
239	CM-4	INTERIOR	NURSING	40026	1	T8 1x4 2-Lamp Strip Fixture with 20 Watt 4 Lamps	88	0.095	3600	298	1	R-4L-12-LED	Re-lamp with (4) 12-Watt LED T8 4 Lamps, Direct View to Socket	00	0.094	0.035	3,000	176	123
240	CM-4	INTERIOR	NURSING	20026	1	T8 1x4 2-Lamp Strip Fixture with 20 Watt 4 Lamps	43	0.043	3600	151	1	R-2L-12-LED	Re-lamp with (2) 12-Watt LED T8 4 Lamps, Direct View to Socket	25	0.023	0.016	3,000	48	03
241	CM-4	INTERIOR	NURSING	CF13U	1	13 Watt Compact Fluorescent with 10 Watt 1 Fixture	13	0.013	3600	46	1	ZZ 200	No Retrofit	13	0.013	0.000	3,000	46	0
242	CM-4	INTERIOR	NURSING	CF13C	1	13 Watt Compact Fluorescent Square Fixture	13	0.013	3600	46	1	ZZ 200	No Retrofit	13	0.013	0.000	3,000	46	0
243	CM-4	INTERIOR	NURSING	08C	1	80 Watt Incandescent Corner Fixture	60	0.020	3600	210	1	LED 10A	Re-Lamp with (1) 10 Watt LED A19 Lamp, Direct View to Socket	10	0.010	0.000	3,000	36	175
244	CM-4	INTERIOR	HALL	3L25	10	T8 1x4 2-Lamp Troffer Fixture	65	1.235	3600	4,323	10	R-3L-12-LED	Re-lamp with (3) 12-Watt LED T8 4 Lamps, Direct View to Socket	37.5	0.713	0.523	3,000	2,404	1,820
245	CM-4	INTERIOR	HALL	2W25	1	T8 1x4 2-Lamp Vario Fluorescent with 25 Watt 4 Lamps	43	0.043	3600	191	1	R-2L-12-LED	Re-lamp with (2) 12-Watt LED T8 4 Lamps, Direct View to Socket	25	0.025	0.016	3,000	66	03
246	CM-4	INTERIOR	HALL	2PL1DR	2	13 Watt Fluorescent CFL Down Fixture	26	0.026	3600	196	2	R-2W-1LED	Re-lamp with (2) 1-Watt LED T8 4 Lamps, Direct View to Socket	12	0.024	0.032	3,000	84	112
247	CM-4	INTERIOR	RESTROOM	2W23	0	T8 1x4 2-Lamp Vario Fluorescent with 25 Watt 4 Lamps	43	0.215	3600	703	0	R-2L-12-LED	Re-lamp with (2) 12-Watt LED T8 4 Lamps, Direct View to Socket	25	0.126	0.080	3,000	438	216
248	CM-4	INTERIOR	RESTROOM	1W25	6	T8 1x4 2-Lamp Vario Fluorescent with 25 Watt 4 Lamps	22	0.110	3600	385	6	R-1L-12-LED	Re-lamp with (1) 12-Watt LED T8 4 Lamps, Direct View to Socket	12.5	0.063	0.046	3,000	270	166
249	CM-4	INTERIOR	DAY TV	3L20R	0	T8 2x4 2-Lamp Troffer Fixture with 20 Watt 4 Lamps (R-UV)	69	0.300	3600	1,305	0	R-3L-12-LED	Re-lamp with (3) 12-Watt LED T8 4 Lamps, Direct View to Socket	37.5	0.225	0.185	3,000	784	578
250	CM-4	INTERIOR	RESTROOM	1W25-FT	1	T8 1x4 2-Lamp Vario Fluorescent	22	0.022	3600	77	1	R-1L-10-LEDZ	Re-lamp with (1) 10-Watt LED T8 2 Lamps, Direct View to Socket	12	0.012	0.010	3,000	42	35
251	CM-4	INTERIOR	DAY ROOM	2L125	0	T8 1x4 2-Lamp Troffer Fixture with 20 Watt 4 Lamps	43	0.226	3600	683	0	R-2L-12-LED	Re-lamp with (2) 12-Watt LED T8 4 Lamps, Direct View to Socket	25	0.156	0.108	3,000	625	370
252	CM-4	INTERIOR	OFFICE	1W25	1	T8 1x4 2-Lamp Vario Fluorescent with 25 Watt 4 Lamps	22	0.022	3600	77	1	R-1L-12-LED	Re-lamp with (1) 12-Watt LED T8 4 Lamps, Direct View to Socket	12.5	0.013	0.010	3,000	44	33

PRELIMINARY AUDIT

EXISTING FIXTURES

PROPOSED FIXTURE UPGRADE

ID #	Facility Name	Phase	Room Description	CEM Code	Qty	Description	Watts	KW	Pre Burn Hours	W/h	Qty	New Code	Description	Watts	KW	W/h	W/h	KW Saved	W/h	Pre Burn Hours	KW Saved		
203	CM4	INTERIOR	JANITOR	PL13DL	1	13 Watt Plug-In CFL Downlight Fixture	13	0.013	3600	46	1	R-1P-AL-LED	Re-Lamp with (1) 6 Watt LED Plug-In Lamp, Existing CFL, Default Remains	6	0.006	0.007	5	0.005	3,600	21	3,600	25	
204	CM4	INTERIOR	NURSING STATION	3L2S	4	T8 24-24 Lamp Troffer Fixture with 25 Watt 4 Lamps, (3) Ballast	66	0.200	3600	810	4	R-3L-12-LED	Re-Lamp with (3) 12 Watt LED T8 4 Lamps, Direct Wire to Socket	36	0.108	0.110	27.6	0.352	3,600	827	3,600	395	
205	CM4	INTERIOR	BREAK ROOM	4L20H	2	T8 24-24 Lamp Troffer Fixture with 25 Watt 4 Lamps, (3) Ballast	66	0.170	3600	538	2	R-4L-12-LED	Re-Lamp with (4) 12 Watt LED T8 4 Lamps, Direct Wire to Socket	48	0.144	0.070	50	0.100	3,600	380	3,600	240	
206	CM4	INTERIOR	MEDICATION	4L20H	2	T8 24-24 Lamp Troffer Fixture with 25 Watt 4 Lamps, (3) Ballast	66	0.170	3600	566	2	R-4L-12-LED	Re-Lamp with (4) 12 Watt LED T8 4 Lamps, Direct Wire to Socket	48	0.144	0.070	50	0.100	3,600	380	3,600	240	
207	CM4	INTERIOR	STORAGE	2W2S	4	T8 14-24 Lamp Vario Fixture with 25 Watt 4 Lamps	43	0.172	3600	822	4	R-2L-12-LED	Re-Lamp with (2) 12 Watt LED T8 4 Lamps, Direct Wire to Socket	24	0.072	0.072	25	0.108	3,600	350	3,600	282	
208	CM4	INTERIOR	STORAGE	3L2S	1	T8 24-24 Lamp U-Lamp Troffer Fixture with 7 Lamps	62	0.092	3600	217	1	R-2L-12-LED	Re-Lamp with (2) 12 Watt LED T8 4 Lamps, Direct Wire to Socket	24	0.072	0.072	20	0.020	3,600	70	3,600	147	
209	CM4	INTERIOR	STORAGE	1V2S	3	T8 14-24 Lamp Vario Fixture with 25 Watt 4 Lamps	22	0.066	3600	231	3	R-1L-12-LED	Re-Lamp with (1) 12 Watt LED T8 4 Lamps, Direct Wire to Socket	12	0.036	0.020	12.5	0.034	3,600	131	3,600	100	
210	CM4	INTERIOR	STORAGE	2P13DR	3	13 Watt Plug-In CFL 2-Lamp Square Downlight Fixture	26	0.084	3600	204	3	R-2P-AL-LED	Re-Lamp with (2) 6 Watt LED Plug-In Lamps, Existing CFL, Default Remains	12	0.036	0.048	12	0.034	3,600	121	3,600	186	
211	CM4	INTERIOR	STORAGE	2P13DR	2	13 Watt Plug-In CFL 2-Lamp Square Downlight Fixture	26	0.086	3600	196	2	R-2P-AL-LED	Re-Lamp with (2) 6 Watt LED Plug-In Lamps, Existing CFL, Default Remains	12	0.036	0.032	12	0.034	3,600	64	3,600	112	
212	CM4	INTERIOR	JANITOR	QF2S	1	23 Watt Compact Fluorescent Fixture	23	0.023	3600	81	1	LED 18A	Re-Lamp with (1) 10 Watt LED 18A	10	0.010	0.010	10	0.010	3,600	35	3,600	41	
213	CM3	INTERIOR	SUMMARY	QF13	8	13 Watt Compact Fluorescent Fixture	13	0.104	3600	364	8	LED 18A	Re-Lamp with (1) 10 Watt LED 18A	10	0.010	0.024	10	0.010	3,600	280	3,600	14	
214	CM3	INTERIOR	SUMMARY	QF13WP	2	13 Watt Compact Fluorescent Vario Fixture	13	0.026	3600	91	2	Z2 00	No Retrofit	No Retrofit	13	0.026	0.000	13	0.026	3,600	91	3,600	0
215	CM3	INTERIOR	SUMMARY	QF13WP	2	13 Watt Compact Fluorescent Vario Fixture	13	0.026	3600	91	2	Z2 00	No Retrofit	No Retrofit	13	0.026	0.000	13	0.026	3,600	91	3,600	0
216	CM3	INTERIOR	SUMMARY	3L2S	38	T8 24-24 Lamp Troffer Fixture with 25 Watt 4 Lamps	65	2.340	3600	8,190	38	R-3L-12-LED	Re-Lamp with (3) 12 Watt LED T8 4 Lamps, Existing CFL, Default Remains	36	1.350	0.090	37.5	1.350	3,600	4,721	3,600	3,495	
217	CM3	INTERIOR	SUMMARY	2P13DR	6	13 Watt Plug-In CFL 2-Lamp Square Downlight Fixture	26	0.224	3600	784	6	R-2P-AL-LED	Re-Lamp with (2) 6 Watt LED Plug-In Lamps, Existing CFL, Default Remains	12	0.036	0.128	12	0.036	3,600	326	3,600	446	
218	CM3	INTERIOR	SUMMARY	QF2S/ALTERN	8	23 Watt Compact Fluorescent U-Lamp Fixture	23	0.144	3600	644	8	Z2 00	No Retrofit	No Retrofit	23	0.184	0.000	23	0.184	3,600	644	3,600	0
219	CM3	INTERIOR	SUMMARY	1W17	58	T8 24-24 Lamp Vario Fixture	22	1.276	3600	4,466	58	R-1L-10-LED	Re-Lamp with (1) 10 Watt LED T8 4 Lamps, Direct Wire to Socket	10	0.030	0.066	10	0.030	3,600	2,020	3,600	2,600	
220	CM3	INTERIOR	SUMMARY	408C	64	10 Watt Incandescent Bi-Pin Point	60	3.640	3600	13,440	64	LED 18A	Re-Lamp with (1) 10 Watt LED 18A	10	0.040	3.200	10	0.040	3,600	2,296	3,600	11,200	
221	CM3	INTERIOR	HALL	21L2S	16	T8 14-24 Lamp Troffer Fixture with 25 Watt 4 Lamps	43	0.996	3600	2,408	16	R-2L-12-LED	Re-Lamp with (2) 12 Watt LED T8 4 Lamps, Direct Wire to Socket	24	0.480	0.268	25	0.480	3,600	1,800	3,600	1,800	
222	CM3	INTERIOR	HALL	2W2S	18	T8 14-24 Lamp Vario Fixture with 25 Watt 4 Lamps	43	0.774	3600	2,700	18	R-2L-12-LED	Re-Lamp with (2) 12 Watt LED T8 4 Lamps, Direct Wire to Socket	24	0.480	0.264	25	0.480	3,600	1,575	3,600	1,154	
223	CM3	INTERIOR	HALL	20C2S	16	T8 14-24 Lamp U-Lamp Fixture with 25 Watt 4 Lamps	43	0.688	3600	2,408	16	R-2L-12-LED	Re-Lamp with (2) 12 Watt LED T8 4 Lamps, Direct Wire to Socket	24	0.480	0.296	25	0.480	3,600	1,400	3,600	1,800	
224	CM3	INTERIOR	HALL	1W17	6	T8 24-24 Lamp Vario Fixture	22	0.132	3600	462	6	R-1L-10-LED	Re-Lamp with (1) 10 Watt LED T8 4 Lamps, Direct Wire to Socket	10	0.030	0.072	10	0.030	3,600	210	3,600	282	
225	CM3	INTERIOR	HALL	2W2S	2	T8 14-24 Lamp Vario Fixture with 25 Watt 4 Lamps	43	0.999	3600	301	2	R-2L-12-LED	Re-Lamp with (2) 12 Watt LED T8 4 Lamps, Direct Wire to Socket	24	0.480	0.038	25	0.480	3,600	175	3,600	126	
226	CM3	INTERIOR	HALL	2P13DR/2L	10	13 Watt Plug-In CFL 2-Lamp Square Downlight Fixture	26	0.290	3600	990	10	R-2P-AL-LED	Re-Lamp with (2) 6 Watt LED Plug-In Lamps, Existing CFL, Default Remains	12	0.120	0.160	12	0.120	3,600	420	3,600	240	
227	CM3	INTERIOR	HALL	1V2S	8	T8 14-24 Lamp Vario Fixture with 25 Watt 4 Lamps	22	0.376	3600	610	8	R-1L-12-LED	Re-Lamp with (1) 12 Watt LED T8 4 Lamps, Direct Wire to Socket	12	0.120	0.070	12.5	0.120	3,600	300	3,600	246	
228	CM3	INTERIOR	HALL	70F13CHAND	4	13 Watt Compact Fluorescent 7-Lamp Chandelier Fixture	91	0.394	3600	1,274	4	Z2 00	No Retrofit	No Retrofit	91	0.394	0.000	91	0.394	3,600	1,274	3,600	0
229	CM3	INTERIOR	HALL	4CC2S	4	T8 14-24 Lamp U-Lamp Fixture with 25 Watt 4 Lamps	43	0.340	3600	1,390	4	R-4L-12-LED	Re-Lamp with (4) 12 Watt LED T8 4 Lamps, Direct Wire to Socket	48	0.200	0.140	50	0.200	3,600	700	3,600	490	
230	CM3	INTERIOR	HALL	1L2S	6	T8 14-24 Lamp Incandescent Fixture with 25 Watt 4 Lamps	22	0.132	3600	462	6	R-1L-12-LED	Re-Lamp with (1) 12 Watt LED T8 4 Lamps, Direct Wire to Socket	12	0.075	0.097	12.5	0.075	3,600	210	3,600	290	

PRELIMINARY AUDIT

EXISTING FEATURES

PROPOSED FEATURE UPGRADE

ID #	Facility Name	Phase	Room Description	ESR Code	Qty	Description	Watts	W	Pre Burn Hours	Wth	City	New Code	Description	Watts	KW	KW Saved	KW Cost Savings	Post Burn Hours	MWh	MWh Saved
211	CM-3	INTERIOR	HALL	CF3B00L	2	13 WME Compact Fluorescent Receptacle Fluorescent Fixture	13	0.026	3600	01	2	ZZ-DD	No Recept.	13	0.026	0.000	\$	3,600	01	0
212	CM-8	INTERIOR	HALL	CF23	2	23 WME Compact Fluorescent Fixture	23	0.046	3600	191	2	LED 10A	Re-Lamp with (1) 10 WME LED A19 Lamp, Direct Type II Socket	10	0.020	0.026	\$	3,600	70	91
213	CM-6	INTERIOR	ELEVATORS	422B-PT	16	T8 150 1-Lamp Shop Fixture	21	0.302	3600	1,232	19	R-1-L/LED07	Re-Lamp with (1) 12 WME LED T8 2 Lamp, Direct Type II Socket	12	0.162	0.140	\$	3,200	672	260
214	BLD01	INTERIOR	HALL	1W17	2	T8 200 1-Lamp Vmp Fixture	22	0.044	8726	344	2	R-1-L/LED02	Re-Lamp with (1) 10 WME LED T8 2 Lamp, Direct Type II Socket	10	0.020	0.024	\$	8,726	176	210
215	BLD01	INTERIOR	SUMMARY	21L28	16	T8 150 1-Lamp Vmp Fixture with 25 WME 4-Lamp	43	0.774	8726	6,762	16	R-3-L/LED02	Re-Lamp with (3) 23 WME LED T8 4 Lamp, Direct Type II Socket	23	0.460	0.304	\$	8,726	3,031	2,619
216	BLD01	INTERIOR	SUMMARY	CF13	26	13 WME Compact Fluorescent Fixture	13	0.326	8726	2,953	26	LED 10A	Re-Lamp with (1) 10 WME LED A19 Lamp, Direct Type II Socket	10	0.200	0.078	\$	8,726	2,271	881
217	BLD01	INTERIOR	SUMMARY	CF19LUM	6	13 WME Compact Fluorescent RLF Fixture	13	0.104	8726	600	6	ZZ-DD	No Recept.	13	0.104	0.000	\$	8,726	600	0
218	BLD01	INTERIOR	SUMMARY	CF23	2	23 WME Compact Fluorescent Fixture	23	0.046	8726	462	2	LED 10A	Re-Lamp with (1) 10 WME LED A19 Lamp, Direct Type II Socket	10	0.020	0.026	\$	8,726	176	227
219	BLD01	INTERIOR	SUMMARY	2P-LDR	14	10 WME Fluorescent Lamp	24	0.392	8726	3,426	14	R-2P-L/LED	Re-Lamp with (2) 13 WME LED T8 4 Lamp, Direct Type II Socket	13	0.146	0.224	\$	8,726	1,468	1,997
220	BLD01	INTERIOR	SUMMARY	60A	2	60 WME Fluorescent Lamp	60	0.120	8726	1,948	2	LED 10A	Re-Lamp with (1) 10 WME LED A19 Lamp, Direct Type II Socket	10	0.020	0.100	\$	8,726	176	874
221	BLD01	INTERIOR	SUMMARY	4C003	47	T8 150 1-Lamp Shop Fixture with 25 WME 4-Lamp	65	3.596	8726	34,000	47	R-4-L/LED02	Re-Lamp with (4) 23 WME LED T8 4 Lamp, Direct Type II Socket	23	2.360	1.236	\$	8,726	20,030	14,371
222	BLD01	INTERIOR	SUMMARY	21L28	133	T8 150 1-Lamp Shop Fixture with 25 WME 4-Lamp	43	0.710	8726	40,801	133	R-3-L/LED02	Re-Lamp with (3) 23 WME LED T8 4 Lamp, Direct Type II Socket	23	3.126	2.394	\$	8,726	20,607	20,914
223	BLD01	INTERIOR	SUMMARY	4W22	0	T8 150 1-Lamp Shop Fixture with 25 WME 4-Lamp	65	0.705	8726	6,903	0	R-4-L/LED02	Re-Lamp with (4) 23 WME LED T8 4 Lamp, Direct Type II Socket	23	0.460	0.310	\$	8,726	3,001	2,723
224	BLD01	INTERIOR	SUMMARY	3W25	14	T8 150 1-Lamp Shop Fixture with 25 WME 4-Lamp	65	0.910	8726	7,600	14	R-3-L/LED02	Re-Lamp with (3) 23 WME LED T8 4 Lamp, Direct Type II Socket	23	0.026	0.340	\$	8,726	4,666	3,203
225	BLD01	INTERIOR	SUMMARY	2C030	76	T8 150 1-Lamp Shop Fixture with 25 WME 4-Lamp	43	3.268	8726	26,949	76	R-2-L/LED02	Re-Lamp with (2) 13 WME LED T8 4 Lamp, Direct Type II Socket	13	1.600	1.340	\$	8,726	10,598	11,081
226	BLD01	INTERIOR	SUMMARY	4L28	3	T8 200 1-Lamp Vmp Fixture with 25 WME 4-Lamp	60	0.226	8726	2,226	3	R-4-L/LED02	Re-Lamp with (4) 23 WME LED T8 4 Lamp, Direct Type II Socket	23	0.150	0.105	\$	8,726	1,310	917
227	BLD01	INTERIOR	SUMMARY	1W17	20	T8 200 1-Lamp Vmp Fixture	22	0.026	8726	4,420	20	R-1-L/LED02	Re-Lamp with (1) 10 WME LED T8 2 Lamp, Direct Type II Socket	10	0.020	0.276	\$	8,726	2,609	2,411
228	BLD01	INTERIOR	SUMMARY	1C2	0	T8 150 1-Lamp Shop Fixture with 25 WME 4-Lamp	22	0.132	8726	1,153	0	R-1-L/LED02	Re-Lamp with (1) 10 WME LED T8 2 Lamp, Direct Type II Socket	10	0.020	0.097	\$	8,726	695	408
229	BLD01	INTERIOR	SUMMARY	2P-LWMP	2	15 WME Fluorescent Lamp with 25 WME 4-Lamp	29	0.026	8726	460	2	R-2P-L/LED	Re-Lamp with (2) 13 WME LED T8 4 Lamp, Direct Type II Socket	13	0.024	0.032	\$	8,726	210	290
230	BLD01	INTERIOR	SUMMARY	3L27	3	T8 150 1-Lamp Shop Fixture with 25 WME 4-Lamp	43	0.120	8726	1,127	3	R-2-L/LED02	Re-Lamp with (2) 13 WME LED T8 4 Lamp, Direct Type II Socket	13	0.079	0.054	\$	8,726	695	472
231	BLD01	INTERIOR	SUMMARY	1W17	2	T8 200 1-Lamp Vmp Fixture	22	0.044	8726	384	2	R-1-L/LED02	Re-Lamp with (1) 10 WME LED T8 2 Lamp, Direct Type II Socket	10	0.020	0.024	\$	8,726	176	210
232	BLD01	INTERIOR	SUMMARY	240A	1	60 WME Fluorescent Lamp	100	0.120	8726	1,948	1	LED 3-0A	Re-Lamp with (2) 10 WME LED A19 Lamp, Direct Type II Socket	20	0.020	0.100	\$	8,726	176	874
233	BLD01	INTERIOR	SUMMARY	5P-L0600L	3	15 WME Fluorescent Lamp with 25 WME 4-Lamp	29	0.094	8726	734	3	R-2P-L/LED	Re-Lamp with (2) 13 WME LED T8 4 Lamp, Direct Type II Socket	13	0.024	0.046	\$	8,726	314	419
234	BLD01	INTERIOR	SUMMARY	2W25	3	T8 150 1-Lamp Shop Fixture with 25 WME 4-Lamp	43	0.120	8726	1,127	3	R-2-L/LED02	Re-Lamp with (2) 13 WME LED T8 4 Lamp, Direct Type II Socket	13	0.076	0.054	\$	8,726	655	472
235	BLD01	INTERIOR	SUMMARY	30F0000R	6	10 WME Compact Fluorescent Lamp with 25 WME 4-Lamp	27	0.216	8726	1,987	6	ZZ-DD	No Recept.	27	0.216	0.000	\$	8,726	1,987	0
236	BLD01	INTERIOR	SUMMARY	CF13000L	2	13 WME Compact Fluorescent Square Compact Fixture	13	0.026	8726	227	2	ZZ-DD	No Recept.	13	0.026	0.000	\$	8,726	227	0
237	BLD01	INTERIOR	SUMMARY	440V	1	60 WME Fluorescent Lamp with 25 WME 4-Lamp	240	0.240	8726	2,007	1	LED 4-0A	Re-Lamp with (4) 10 WME LED A19 Lamp, Direct Type II Socket	40	0.040	0.200	\$	8,726	340	1,747
238	BLD01.6.7	EXTERIOR	EXTERIOR	60A	4	60 WME Fluorescent Lamp	60	0.240	8726	2,007	4	LED 10A	Re-Lamp with (1) 10 WME LED A19 Lamp, Direct Type II Socket	10	0.040	0.200	\$	8,726	340	1,747

PRELIMINARY AUDIT

EXISTING FIXTURES

PROPOSED FIXTURE UPGRADE

ID #	Facility Name	Phase	Room Description	EDM Code	Qty	Description	Watts	KW	Pre Burn Hours	Wkth	City	New Code	Description	Watts	KW	KW Saved	Pre Burn Hours	Wkth	KWh Saved	
300	BLDG 5.67	EXTERIOR	EXTERIOR	40400SL	4	40 Watt Metal Halide Flood Fixture	469	1.820	0726	16,000	4	N-CLED12SL	New 120 Watt LED Flood Fixture	123	0.516	1.304	-	6,736	4,264	11,932
310	BLDG 5.67	EXTERIOR	EXTERIOR	2PL20WP	20	20 Watt Plug-In CFL 2-Lamp Wall Flood Fixture	56	1.160	0726	16,034	20	R-2PL-11LED	Re-Lamp with (2) 11 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	26	0.820	0.340	-	6,736	4,594	8,591
311	BLDG 5.67	EXTERIOR	EXTERIOR	2PL10WP	60	10 Watt Plug-In CFL 2-Lamp Wall Flood Fixture	26	1.660	0726	14,076	60	R-2PL-6LED	Re-Lamp with (2) 6 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.720	0.940	-	6,736	6,200	8,937
312	BLDG 5.67	EXTERIOR	EXTERIOR	MHT1FL	1	10 Watt Metal Halide Flood Fixture	213	0.213	0726	1,991	1	N-CLED06FL	New 60 Watt LED Flood Fixture	60	0.800	0.120	-	6,736	740	1,719
313	BLDG 5.67	EXTERIOR	EXTERIOR	PL10U	2	10 Watt Plug-In CFL 1-Watt Jar Flood Fixture	14	0.028	0726	248	2	R-1PL-6LED	Re-Lamp with (1) 6 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	6	0.012	0.016	-	6,736	195	140
314	BLDG 5.67	EXTERIOR	EXTERIOR	LDDPS	11	LED PAR30 Fixture	17	0.197	0726	1,904	11	Z2-00	No Retrofit	17	0.197	0.000	-	6,736	1,634	0
316	BLDG 5.67	EXTERIOR	EXTERIOR	MHT1FL	10	10 Watt Metal Halide Flood Fixture	213	2.130	0726	16,006	10	N-CLED06FL	New 60 Watt LED Flood Fixture	60	0.800	1.330	-	6,736	7,426	11,182
316	BLDG 5.67	EXTERIOR	EXTERIOR	CP10U	13	13 Watt Compact Fluorescent Jar Flood Fixture	13	0.195	0726	1,704	13	Z2-00	No Retrofit	13	0.195	0.000	-	6,736	1,704	0
317	BLDG 5.67	EXTERIOR	EXTERIOR	2PL10CPY	4	10 Watt Plug-In CFL 2-Lamp Canopy Fixture	26	0.112	0726	978	4	R-2PL-6LED	Re-Lamp with (2) 6 Watt LED Plug-In Lamps, Existing CFL, Ballast Remains	12	0.648	0.536	-	6,736	470	996
318	BLDG 5.67	INTERIOR	AUDITORIUM COVE	2000SJT	32	16 1/2-Lamp Drop Fixture	46	1.568	0726	13,684	32	R-2L-10LED	Retrofit with (2) 10 Watt LED T8 4-Lamp, Direct Wire to Socket	24	0.794	0.890	-	6,736	6,736	8,896
319	BLDG 5.67	INTERIOR	AUDITORIUM COVE	CF1500L	12	15 Watt Compact Fluorescent Downlight Fixture	13	0.181	0726	1,363	12	Z2-00	No Retrofit	12	0.181	0.000	-	6,736	1,363	0
320	BLDG 5.67	INTERIOR	AUDITORIUM COVE	300000L	80	300 Watt Incandescent Downlight Fixture	300	16.000	0726	112,246	80	LED 300000	Re-Lamp with (1) 30 Watt LED 0.000-200 Lamp, Halogen Ballast	30	2.160	16.440	-	6,736	16,870	136,376
321	BLDG 5.67	INTERIOR	HALL	2W025	20	14-Lamp Vero Fixture with 25 Watt 4-Lamps	43	0.860	0726	7,613	20	R-2L-10LED	Retrofit with (2) 10 Watt LED T8 4-Lamp, Direct Wire to Socket	20	0.600	0.360	-	6,736	4,368	3,146
322	BLDG 5.67	INTERIOR	HALL	DSMR16	12	50 Watt Incandescent MR16 Fixture	50	0.600	0726	5,542	12	Z2-00	No Retrofit	12	0.600	0.000	-	6,736	5,542	0
323	BLDG 5.67	INTERIOR	HALL	402L4	6	40 Watt Incandescent 4" Downlight Fixture	40	0.240	0726	2,977	6	LED 40200	Re-Lamp with (1) 5 Watt LED BR20	6	0.048	0.192	-	6,736	416	1,677
324	BLDG 5.67	INTERIOR	CHAPL	2W025	86	14-Lamp Vero Fixture with 25 Watt 4-Lamps	43	2.784	0726	33,697	86	R-2L-10LED	Retrofit with (2) 10 Watt LED T8 4-Lamp, Direct Wire to Socket	20	2.200	1.584	-	6,736	19,216	13,481
325	BLDG 5.67	INTERIOR	CONFERENCE	2L26	10	14-Lamp Vero Fixture with 25 Watt 4-Lamps	43	0.330	0726	4,683	10	R-2L-10LED	Retrofit with (2) 10 Watt LED T8 4-Lamp, Direct Wire to Socket	20	0.320	0.234	-	6,736	2,819	2,044
326	BLDG 5.67	INTERIOR	CONFERENCE	DEPN02L	16	20 Watt Incandescent PAR30 Downlight Fixture	60	1.600	0726	14,102	16	LED 200940	Re-Lamp with (1) 17 Watt LED BR40	17	0.305	1.295	-	6,736	2,873	11,479
327	BLDG 5.67	INTERIOR	KITCHEN	4L26	75	14-Lamp Vero Fixture with 25 Watt 4-Lamps	85	4.375	0726	56,662	75	R-4L-10LED	Retrofit with (4) 10 Watt LED T8 4-Lamp, Direct Wire to Socket	20	3.700	2,626	-	6,736	32,700	22,032
328	BLDG 5.67	INTERIOR	KITCHEN	CF20U	6	20 Watt Compact Fluorescent Jar Flood Fixture	23	0.194	0726	1,697	6	Z2-00	No Retrofit	23	0.194	0.000	-	6,736	1,697	0
329	BLDG 5.67	INTERIOR	KITCHEN	40U	6	60 Watt Incandescent 4-Lamp Jar Flood Fixture	60	0.460	0726	4,183	6	LED 16A	Re-Lamp with (1) 10 Watt LED A19	10	0.090	0.400	-	6,736	699	3,464
330	BLDG 5.67	INTERIOR	KITCHEN	2W025	28	14-Lamp Vero Fixture with 25 Watt 4-Lamps	43	1.204	0726	16,618	28	R-2L-10LED	Retrofit with (2) 10 Watt LED T8 4-Lamp, Direct Wire to Socket	20	0.700	0.504	-	6,736	6,116	4,483
331	BLDG 5.67	INTERIOR	OFFICE	20026	4	14-Lamp Vero Fixture with 25 Watt 4-Lamps	43	0.172	0726	1,503	4	R-2L-10LED	Retrofit with (2) 10 Watt LED T8 4-Lamp, Direct Wire to Socket	20	0.100	0.072	-	6,736	674	629
332	BLDG 5.67	INTERIOR	OFFICE	21L26	4	14-Lamp Vero Fixture with 25 Watt 4-Lamps	43	0.172	0726	1,503	4	R-2L-10LED	Retrofit with (2) 10 Watt LED T8 4-Lamp, Direct Wire to Socket	20	0.100	0.072	-	6,736	674	629
333	BLDG 17	INTERIOR	SUMMARY	10P	2	14-Lamp Incandescent Fixture with 25 Watt 4-Lamps	22	0.044	0	0	2	R-1L-10LED	Retrofit with (1) 10 Watt LED T8 2-Lamp, Direct Wire to Socket	12.5	0.026	0.010	-	0	0	0
334	BLDG 17	INTERIOR	SUMMARY	1V25	3	14-Lamp Vero Fixture with 25 Watt 4-Lamps	22	0.066	0	0	3	R-1L-10LED	Retrofit with (1) 10 Watt LED T8 2-Lamp, Direct Wire to Socket	12.5	0.026	0.020	-	0	0	0
335	BLDG 17	INTERIOR	SUMMARY	1W17	30	18.00-Lamp Vero Fixture	22	0.660	0	0	30	R-1L-10LED	Retrofit with (1) 10 Watt LED T8 2-Lamp, Direct Wire to Socket	10	0.300	0.360	-	0	0	0
336	BLDG 17	INTERIOR	SUMMARY	1W25	26	14-Lamp Vero Fixture with 25 Watt 4-Lamps	22	0.676	0	0	26	R-1L-10LED	Retrofit with (1) 10 Watt LED T8 2-Lamp, Direct Wire to Socket	12.5	0.300	0.360	-	0	0	0

PRELIMINARY AUDIT

EXISTING FIXTURES

PROPOSED FIXTURE UPGRADE

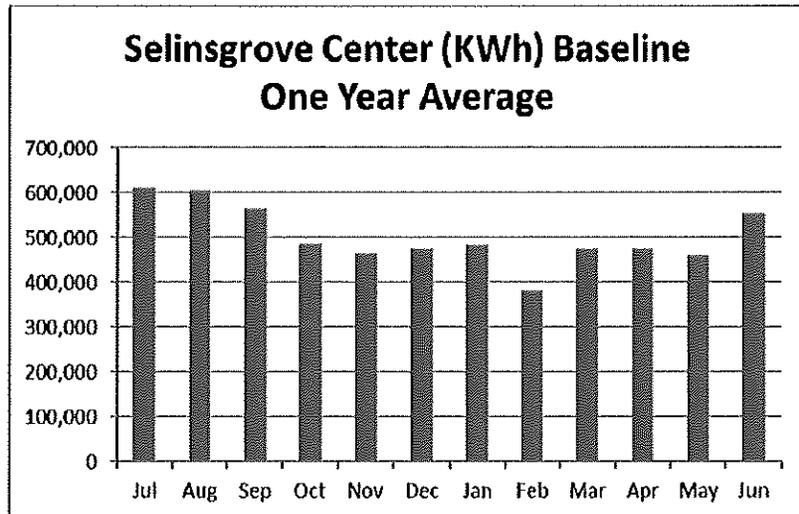
ID #	Facility Name	Phase	Room Description	BSM Code	Qty	Description	Watts	KW	Pre Burn Hours	Watt	Qty	New Code	Description	Watts	KW	RPV Saved	KW Cost Savings	Post Burn Hours	MWh	MWh Saved		
337	BLDG 17	INTERIOR	SUMMARY	2PUBSC	48	13 Watt Plug-In CFL, recessed fixture	26	1.344	0	0	48	R-2P-4LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamps, Dabbing CFL, Ballast Trimless	12	0.676	0.796	\$	0	0	0	0	
338	BLDG 17	INTERIOR	SUMMARY	2W025	16	16 Watt 2-Lamp Vmp Fixture with 25 Watt CFL Lamps	43	0.698	0	0	16	R-2L-12LED	Re-Lamp with (2) 12 Watt LED T8 4-Lamp, Direct Wire to Socket	22	0.400	0.296	\$	0	0	0	0	
339	BLDG 17	INTERIOR	SUMMARY	4W025	8	16 Watt 4-Lamp Vmp Fixture with 25 Watt CFL Lamps	85	0.795	0	0	8	R-4L-12LED	Re-Lamp with (4) 12 Watt LED T8 4-Lamp, Direct Wire to Socket	50	0.460	0.315	\$	0	0	0	0	
340	BLDG 17	INTERIOR	SUMMARY	3LED	11	3 Watt LED 3-Lamp Uplight	3	0.033	0	0	11	ZZ-00	No Retrofit	3	0.033	0.000	\$	0	0	0	0	
341	BLDG 17	EXTERIOR	EXTERIOR	2PLSWP	8	20 Watt Plug-In CFL 2-Lamp Wall Pack Fixture	56	0.348	0	0	8	R-2P-4-1LED	Re-Lamp with (2) 11 Watt LED Plug-In Lamps, Dabbing CFL, Ballast Trimless	26	0.165	0.192	\$	0	0	0	0	0
342	BLDG 17	EXTERIOR	EXTERIOR	2PLSWP	4	13 Watt Plug-In CFL 2-Lamp Wall Pack Fixture	26	0.112	0	0	4	R-2P-4-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamps, Dabbing CFL, Ballast Trimless	12	0.048	0.064	\$	0	0	0	0	0
343	BLDG 17	EXTERIOR	EXTERIOR	FL3BUL	1	20 Watt Plug-In CFL, Downlight Fixture	20	0.020	0	0	1	R-2P-4-1LED	Re-Lamp with (2) 11 Watt LED Plug-In Lamps, Dabbing CFL, Ballast Trimless	26	0.026	0.003	\$	0	0	0	0	0
344	BLDG 19	INTERIOR	SUMMARY	1W17	22	16 Watt 2-Lamp Vmp Fixture	22	0.444	0.726	4.226	22	R1L-10LEDZ	Retrofit with (1) 10 Watt LED T8 2-Lamp, Direct Wire to Socket	16	0.220	0.264	\$	0.759	0.759	1.022	2.306	
345	BLDG 19	INTERIOR	SUMMARY	1W25	3	16 Watt 2-Lamp Vmp Fixture with 25 Watt CFL Lamps	22	0.698	0.726	0.77	3	R1L-10-2LED	Retrofit with (1) 10 Watt LED T8 2-Lamp, Direct Wire to Socket	16	0.008	0.020	\$	0.759	0.759	3.03	3.69	
346	BLDG 19	INTERIOR	SUMMARY	2S025	2	16 Watt 2-Lamp Vmp Fixture with 25 Watt CFL Lamps	43	0.696	0.726	0.77	2	R-2L-12LED	Re-Lamp with (2) 12 Watt LED T8 4-Lamp, Direct Wire to Socket	22	0.060	0.036	\$	0.759	0.759	4.27	314	
347	BLDG 19	INTERIOR	SUMMARY	2PUBSC	18	13 Watt Plug-In CFL, recessed fixture	26	0.532	0.726	4.646	18	R-2P-4-LED	Re-Lamp with (2) 8 Watt LED Plug-In Lamps, Dabbing CFL, Ballast Trimless	12	0.226	0.304	\$	0.759	0.759	1.292	2.006	
348	BLDG 19	INTERIOR	SUMMARY	2V25	5	16 Watt 2-Lamp Vmp Fixture with 25 Watt CFL Lamps	43	0.216	0.726	1.676	5	R-2L-12LED	Re-Lamp with (2) 12 Watt LED T8 4-Lamp, Direct Wire to Socket	22	0.120	0.090	\$	0.759	0.759	1.002	796	
349	BLDG 19	INTERIOR	SUMMARY	2W25	41	16 Watt 2-Lamp Vmp Fixture with 25 Watt CFL Lamps	43	1.703	0.726	15.482	41	R-2L-12LED	Re-Lamp with (2) 12 Watt LED T8 4-Lamp, Direct Wire to Socket	22	1.025	0.736	\$	0.759	0.759	0.954	6.427	
350	BLDG 19	INTERIOR	SUMMARY	4S025	10	16 Watt 4-Lamp Vmp Fixture with 25 Watt CFL Lamps	85	0.890	0.726	7.420	10	R-4L-12LED	Retrofit with (4) 12 Watt LED T8 4-Lamp, Direct Wire to Socket	50	0.600	0.390	\$	0.759	0.759	4.248	3.094	
351	BLDG 19	INTERIOR	SUMMARY	CP20	9	20 Watt Compact Fluorescent	20	0.140	0.726	1.972	9	ZZ-00	No Retrofit	20	0.140	0.000	\$	0.759	0.759	1.072	0	

ATTACHMENT 2 – ENERGY BASELINE

Baselines for this proposal are based on fiscal year 2015 (July 2015 through June 2016), as the most current fiscal year of data available at the time of this proposal.

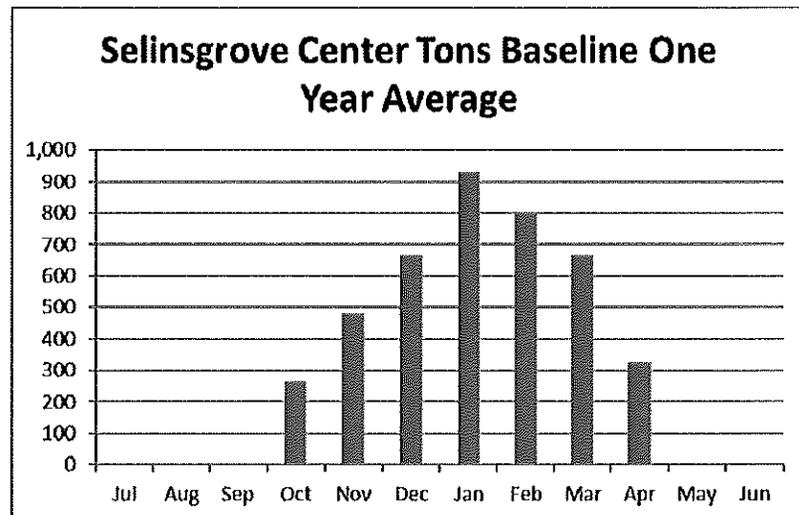
Electricity:

Selinsgrove Center (KWh) Baseline One Year Average	
Month	(KWh)
Jul	613,800
Aug	604,800
Sep	565,360
Oct	487,880
Nov	465,280
Dec	475,240
Jan	485,360
Feb	383,160
Mar	475,360
Apr	474,240
May	460,600
Jun	553,480
Total	6,044,560



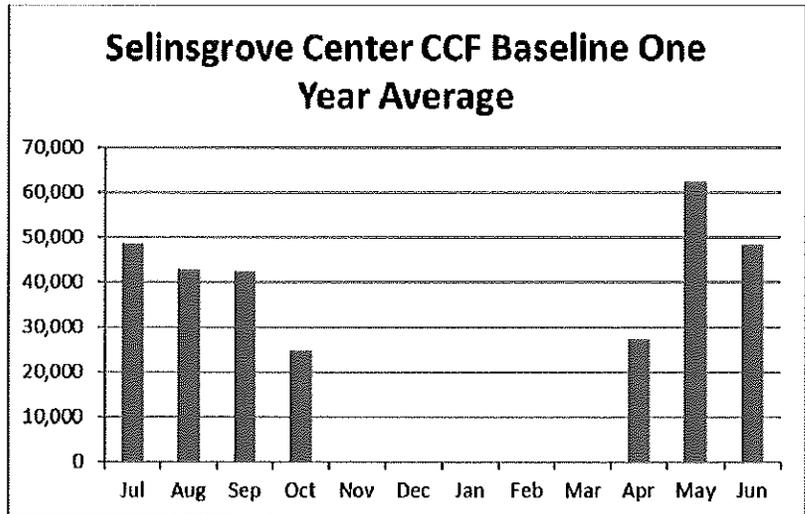
Coal:

Selinsgrove Center Tons Baseline One Year Average	
Month	Tons
Jul	0
Aug	0
Sep	0
Oct	267
Nov	481
Dec	667
Jan	928
Feb	800
Mar	669
Apr	328
May	0
Jun	0
Total	4,140



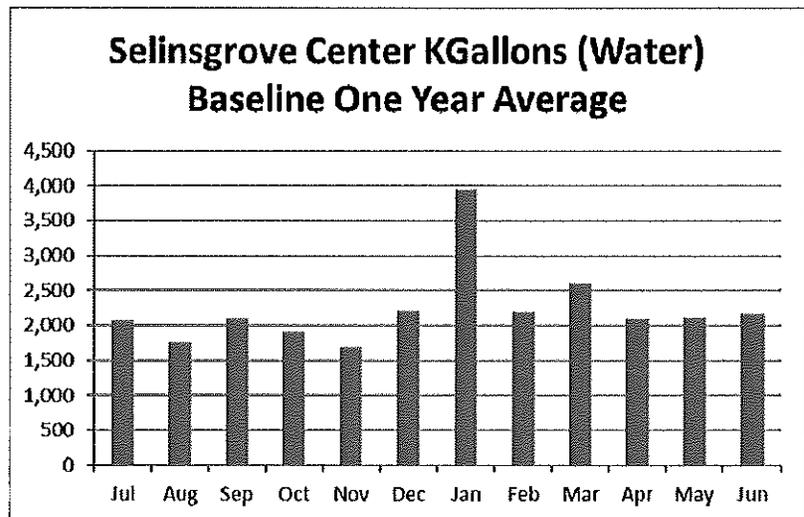
Natural Gas:

Selinsgrove Center CCF Baseline One Year Average	
Month	CCF
Jul	48,510
Aug	42,970
Sep	42,300
Oct	24,870
Nov	0
Dec	0
Jan	0
Feb	0
Mar	0
Apr	27,390
May	62,310
Jun	48,430
Total	296,780



Water:

Selinsgrove Center KGallons (Water) Baseline One Year Average	
Month	KGallons
Jul	2,085
Aug	1,762
Sep	2,112
Oct	1,910
Nov	1,690
Dec	2,213
Jan	3,943
Feb	2,204
Mar	2,617
Apr	2,102
May	2,128
Jun	2,164
Total	26,930



ATTACHMENT 3 – LIGHTING SCOPE

McClure Company is proposing to retrofit the existing exterior fixtures and interior fluorescent fixtures with new LED lamps.

EXISTING FIXTURE DESCRIPTION	PROPOSED RETROFIT DESCRIPTION	QTY
100 Watt Incandescent A-Lamp Fixture	Re-Lamp with (1) 18 Watt LED A21	2
1000 Watt Metal Halide Flood Fixture; Yoke	New 300 Watt LED Flood Fixture	44
13 Watt CFL 7-Lamp Chandelier Fixture	No Retrofit	4
13 Watt CFL Canopy Fixture	Re-Lamp with (1) 10 Watt LED A19	10
13 Watt CFL Downlight Fixture	No Retrofit	12
13 Watt CFL Fixture	Re-Lamp with (1) 10 Watt LED A19	135
13 Watt CFL Jelly Jar Fixture	No Retrofit	16
13 Watt CFL RLM Fixture	No Retrofit	8
13 Watt CFL Sconce Fixture	No Retrofit	1
13 Watt CFL Square Downlight Fixture	No Retrofit	138
13 Watt CFL Wall Pack Fixture	No Retrofit	4
13 Watt Plug-In CFL 2-Lamp Canopy Fixture	Re-Lamp (2) 6 Watt LED Plug-In Lamps; Existing CFL Ballast Remains	49
13 Watt Plug-In CFL 2-Lamp Square Fixture	Re-Lamp (2) 6 Watt LED Plug-In Lamps; Existing CFL Ballast Remains	16
13 Watt Plug-In CFL 2-Lamp Wall Pack Fixture	Re-Lamp (2) 6 Watt LED Plug-In Lamps; Existing CFL Ballast Remains	360
13 Watt Plug-In CFL Downlight Fixture	Re-Lamp (1) 6 Watt LED Plug-In Lamps; Existing CFL Ballast Remains	1
13 Watt Plug-In CFL Drum Fixture	Re-Lamp (2) 6 Watt LED Plug-In Lamps; Existing CFL Ballast Remains	279
13 Watt Plug-In CFL Jelly Jar Fixture	Re-Lamp (1) 6 Watt LED Plug-In Lamps; Existing CFL Ballast Remains	2
13 Watt Plug-In CFL sconce Fixture	Re-Lamp (2) 6 Watt LED Plug-In Lamps; Existing CFL Ballast Remains	297
150 Watt High Pressure Sodium Post Top Fixture	New 52 Watt LED Spider Mount Post Top Fixture	6
150 Watt Incandescent A-Lamp Fixture	Re-Lamp with (1) 18 Watt LED A21	16
150 Watt Metal Halide Dusk to Dawn Fixture	New 26 Watt LED Dusk to Dawn Barnyard Fixture	1
175 Watt Metal Halide Flood Fixture	New 85 Watt LED Flood Fixture	11
20 Watt CFL	No Retrofit	9
20 Watt CFL Square Downlight Fixture	Re-Lamp with (1) 10 Watt LED A19	38
23 Watt CFL 5-Lamp Chandelier Fixture	No Retrofit	4
23 Watt CFL Fixture	Re-Lamp with (1) 10 Watt LED A19	35
23 Watt CFL Jelly Jar Fixture	No Retrofit	8
23 Watt CFL Lantern Fixture	No Retrofit	8
6 Watt Plug-In CFL 2-Lamp Wall Pack Fixture	Re-Lamp (2) 11 Watt LED Plug-In Lamps; Existing CFL Ballast Remains	100
26 Watt Plug-In CFL Downlight Fixture	Re-Lamp (2) 11 Watt LED Plug-In Lamps; Existing CFL Ballast Remains	1

3 Watt LED 2-Lamp Exit Sign	No Retrofit	11
300 Watt Incandescent Square Fixture	Re-Lamp with (1) 36 Watt LED Omni-Cob Lamp; Hardwire Ballast	60
40 Watt Incandescent 4" Downlight Fixture	Re-Lamp with (1) 8 Watt LED BR20	6
40 Watt Incandescent Candelabra Fixture	Re-Lamp with (1) 5 Watt LED Candelabra	10
400 Watt Metal Halide Flood Fixture	New 129 Watt LED Flood Fixture	4
50 Watt Incandescent MR16 Fixture	No Retrofit	12
60 Watt Incandescent 2-Lamp Fixture	Re-Lamp with (2) 10 Watt LED A19	1
60 Watt Incandescent 4-Lamp Vanity Fixture	Re-Lamp with (4) 10 Watt LED A19	1
60 Watt Incandescent A-Lamp Fixture	Re-Lamp with (1) 10 Watt LED A19	16
60 Watt Incandescent A-Lamp Jelly Jar Fixture	Re-Lamp with (1) 10 Watt LED A19	10
60 Watt Incandescent Sconce Fixture	Re-Lamp with (1) 10 Watt LED A19	77
65 Watt CFL RLM Fixture	New 1x4 2-Lamp Industrial Fixture with (2) 12.5 Watt LED T8 4' Lamp; Direct Wire to Socket	18
65 Watt Incandescent PAR38 6" Downlight Fixture; Dimming	Re-Lamp with (1) 10 Watt LED BR30	36
9 Watt CFL 3-Lamp Decorative Drum Fixture	No Retrofit	8
90 Watt Incandescent PAR38 Fixture	Re-Lamp with (1) 17 Watt LED BR40	18
LED PAR38 Fixture	No Retrofit	11
T12 1x4 2-Lamp Egg Crate Fixture	Retrofit with (2) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	1
T5HO 2x4 3-Lamp High Bay Fixture	New 95 Watt LED High Bay Fixture	6
T5HO 2x4 4-Lamp High Bay Fixture	New 95 Watt LED High Bay Fixture	33
T8 1x3 1-Lamp Strip Fixture	Retrofit with (1) 12 Watt LED T8 3' Lamp; Direct Wire to Socket	16
T8 1x3 1-Lamp Vanity Fixture	Retrofit with (1) 12 Watt LED T8 3' Lamp; Direct Wire to Socket	1
T8 1x3 2-Lamp Strip Fixture	Retrofit with (2) 12 Watt LED T8 3' Lamps; Direct Wire to Socket	56
T8 1x4 1-Lamp Industrial Fixture with 25 Watt 4' Lamps	Retrofit with (1) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	127
T8 1x4 1-Lamp Vanity Fixture with 25 Watt 4' Lamps	Retrofit with (1) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	23
T8 1x4 1-Lamp Wrap Fixture with 25 Watt 4' Lamps	Retrofit with (1) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	249
T8 1x4 2-Lamp Egg Crate Fixture with 25 Watt 4' Lamps	Retrofit with (2) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	697
T8 1x4 2-Lamp Industrial Fixture with 25 Watt 4' Lamps	Retrofit with (2) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	42
T8 1x4 2-Lamp Troffer Fixture with 25 Watt 4' Lamps	Retrofit with (2) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	319
T8 1x4 2-Lamp Vanity Fixture with 25 Watt 4' Lamps	Retrofit with (2) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	7
T8 1x4 2-Lamp Vapor tight Fixture	Retrofit with (2) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	24
T8 1x4 2-Lamp Wrap Fixture with 25 Watt 4' Lamps	Retrofit with (2) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	1010
T8 1x4 3-Lamp Industrial Fixture with 25 Watt	Retrofit with (3) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	122



4' Lamps		
T8 1x4 4-Lamp Egg Crate Fixture with 25 Watt 4' Lamps	Retrofit with (4) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	148
T8 1x4 4-Lamp Wrap Fixture with 25 Watt 4' Lamps	Retrofit with (4) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	249
T8 2x2 1-Lamp Vanity Fixture	Retrofit with (1) 10 Watt LED T8 2' Lamp; Direct Wire to Socket	39
T8 2x2 1-Lamp Wrap Fixture	Retrofit with (1) 10 Watt LED T8 2' Lamp; Direct Wire to Socket	403
T8 2x2 2-Lamp Surface Mount Troffer Fixture	Retrofit with (2) 10 Watt LED T8 2' Lamps; Direct Wire to Socket	5
T8 2x2 2-Lamp Troffer Fixture	Retrofit with (2) 10 Watt LED T8 2' Lamps; Direct Wire to Socket	152
T8 2x2 2-Lamp U-Lamp Troffer Fixture with 6" Lamps	Retrofit with (2) 10 Watt LED T8 2' Lamps and (1) 2x2 2-Lamp White Reflector Kit; Direct Wire to Socket	1
T8 2x2 2-Lamp Vandal Proof Fixture	Retrofit with (2) 10 Watt LED T8 2' Lamps; Direct Wire to Socket	31
T8 2x2 3-Lamp Troffer Fixture	Retrofit with (2) 10 Watt LED T8 2' Lamps; Direct Wire to Socket	4
T8 2x4 2-Lamp Surface Mount Troffer Fixture with 25 Watt 4' Lamps	Retrofit with (2) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	32
T8 2x4 2-Lamp Troffer Fixture with 25 Watt 4' Lamps	Retrofit with (2) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	47
T8 2x4 3-Lamp Troffer Fixture	Retrofit with (3) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	91
T8 2x4 3-Lamp Troffer Fixture with 25 Watt 4' Lamps; Bi-Level	Retrofit with (3) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	6
T8 2x4 4-Lamp Surface Mount Troffer Fixture with 25 Watt 4' Lamps	Retrofit with (4) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	24
T8 2x4 4-Lamp Troffer Fixture with 25 Watt 4' Lamps	Retrofit with (4) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	261
T8 2x4 4-Lamp Troffer Fixture with 25 Watt 4' Lamps; Bi-Level	Retrofit with (4) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	4
T8 2x4 6-Lamp Surface Mount Troffer Fixture with 25 Watt 4' Lamps	Retrofit with (6) 12.5 Watt LED T8 4' Lamps; Direct Wire to Socket	36
Vending Machine with Existing VendMiser Control	No Retrofit	2
Grand Total		6,182