ENERGY AUDIT – FINAL REPORT

WILDWOOD CREST
PUBLIC WORKS GARAGE
9301 BAYVIEW DRIVE
WILDWOOD CREST, NJ 08260
ATTN: MR. KEVIN M. YECCO
Borough Clerk/Administrator

CEG PROJECT NO. 9P09039

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I. EXECUTIVE SUMMARY

This report presents the findings of an energy audit conducted for:

The Borough of Wildwood Crest
Public Works Garage
9301 Bayview Drive
Wildwood Crest, NJ 08260

Municipal Contact: Mr. Kevin M. Yecco, Clerk / Administrator
Facility Contact: Mr. Michael Velardo, DPW

This audit was performed in connection with the New Jersey Clean Energy Local Government Energy Audit Program. The energy audit is conducted to promote the mission of the office of Clean Energy, which is to use innovation and technology to solve energy and environmental problems in a way that improves the State's economy. This can be achieved through the wiser and more efficient use of energy.

The annual energy costs at this facility are as follows:

Electricity	$ 12,433
Natural Gas	$ 12,325
Total	$ 24,758

The potential annual energy cost savings for each energy conservation measure (ECM) are shown below in Table 1. Be aware that the ECM's are not additive because of the interrelation of some of the measures. This audit is consistent with an ASHRAE level 2 audit. The cost and savings for each measure is ± 20%. The evaluations are based on engineering estimations and industry standard calculation methods. More detailed analyses would require engineering simulation models, hard equipment specifications, and contractor bid pricing.

Table 1
Energy Conservation Measures (ECM's)

ECM NO.	DESCRIPTION	COST [A]	ANNUAL SAVINGS [B]	SIMPLE PAYBACK (YEARS)	SIMPLE ROI
1	Lighting Upgrade - General	$1,303	$257	5.1	20 %
2	Install Lighting Controls	$110	$17	6.5	15 %
3	Shop Heater Replacement	$21,500	$2,145	10	7.7%

Notes: A. Cost takes into consideration applicable NJ SmartStart™ incentives and maintenance savings.
B. Savings takes into consideration applicable maintenance savings.

The estimated demand and energy savings are shown below in Table 2. The information in this table corresponds to the ECM's in Table 1.

Table 2
Estimated Energy Savings

ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECT DEMAND (KW)	ELECT CONSUMPTION (KWH)	NAT GAS (THERMS)
1	Lighting Upgrade - General	1.062	1,477	-
2	Install Lighting Controls	-	95	-
3	Shop Heater Replacement	-	-	6223

Recommendations:

Concord Engineering Group recommends the implementation of all ECM's that provide a calculated simple payback at or under Ten (10) years. The following Energy Conservation Measures are recommended for the Wildwood Crest Public Works Garage:

- **ECM #1:** Lighting Upgrade - General
- **ECM #2:** Install Lighting Controls
- **ECM#3;** Shop Heater Replacement

In addition to the ECM's, there are maintenance and operational measures that can provide significant energy savings and provide immediate benefit. The ECM's listed above represent investments that can be made to the facility which are justified by the savings seen overtime. However, the maintenance items and small operational improvements below are typically achievable with on site staff or maintenance contractors and in turn have the potential to provide substantial operational savings compared to the costs associated. The following are recommendations which should be considered a priority in achieving an energy efficient building:

1. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.
2. Maintain all weather stripping on entrance doors.
3. Clean all light fixtures to maximize light output.
4. Provide more frequent air filter changes to decrease overall system power usage and maintain better IAQ.

INTRODUCTION

This comprehensive energy audit covers the **8,650** square foot Public Works Garage building located at 9301 Bayview Drive. The building is used for work garage, landscaping, fleet maintenance, trash collection, carpenter shop, public safety office, and public works clerical offices.

Note: The building square footage was verified after field survey and architectural drawing review. The square footage was incorrectly noted on Application "C" as **8,000** square feet.

Electrical and natural gas utility information is collected and analyzed for one full year's energy use of the building. The utility information allows for analysis of the building's operational characteristics; calculate energy benchmarks for comparison to industry averages, estimated savings potential, and baseline usage/cost to monitor the effectiveness of implemented measures. A computer spreadsheet is used to calculate benchmarks and to graph utility information (see the utility profiles below).

The Energy Use Intensity (EUI) is established for the building. Energy Use Intensity (EUI) is expressed in British Thermal Units/square foot/year (BTU/ft^2/yr), which is used to compare energy consumption to similar building types or to track consumption from year to year in the same building. The EUI is calculated by converting the annual consumption of all energy sources to BTU's and dividing by the area (gross square footage) of the building. Blueprints (where available) are utilized to verify the gross area of the facility. The EUI is a good indicator of the relative potential for energy savings. A low EUI indicates less potential for energy savings, while a high EUI indicates poor building performance therefore a high potential for energy savings.

Existing building architectural and engineering drawings (where available) are utilized for additional background information. The building envelope, lighting systems, HVAC equipment, and controls information gathered from building drawings allow for a more accurate and detailed review of the building. The information is compared to the energy usage profiles developed from utility data. Through the review of the architectural and engineering drawings a building profile can be defined that documents building age, type, usage, major energy consuming equipment or systems, etc.

The preliminary audit information is gathered in preparation for the site survey. The site survey provides critical information in deciphering where energy is spent and opportunities exist within a facility. The entire site is surveyed to inventory the following to gain an understanding of how each facility operates:

- Building envelope (roof, windows, etc.)
- Heating, ventilation, and air conditioning equipment (HVAC)
- Lighting systems and controls
- Facility-specific equipment

The building site visit is performed to survey all major building components and systems. The site visit includes detailed inspection of energy consuming components. Summary of building occupancy schedules, operating and maintenance practices, and energy management programs provided by the building manager are collected along with the system and components to determine a more accurate impact on energy consumption.

II. METHOD OF ANALYSIS

Post site visit work includes evaluation of the information gathered, researching possible conservation opportunities, organizing the audit into a comprehensive report, and making recommendations on HVAC, lighting and building envelope improvements. Data collected is processed using energy engineering calculations to anticipate energy usage for each of the proposed energy conservation measures (ECM's). The actual building's energy usage is entered directly from the utility bills provided by the owner. The anticipated energy usage is compared to the historical data to determine energy savings for the proposed ECM's.

It is pertinent to note, that the savings noted in this report are not additive. The savings for each recommendation is calculated as standalone energy conservation measures. Implementation of more than one ECM may in some cases affect the savings of each ECM. The savings may in some cases be relatively higher if an individual ECM is implemented in lieu of multiple recommended ECM's. For example implementing reduced operating schedules for inefficient lighting will result in a greater relative savings. Implementing reduced operating schedules for newly installed efficient lighting will result in a lower relative savings, because there is less energy to be saved. If multiple ECM's are recommended to be implemented, the combined savings is calculated and identified appropriately.

ECM's are determined by identifying the building's unique properties and deciphering the most beneficial energy saving measures available that meet the specific needs of the facility. The building construction type, function, operational schedule, existing conditions, and foreseen future plans are critical in the evaluation and final recommendations. Energy savings are calculated base on industry standard methods and engineering estimations. Energy consumption is calculated based on manufacturer's cataloged information when new equipment is proposed.

Cost savings are calculated based on the actual historical energy costs for the facility. Installation costs include labor and equipment to estimate the full up-front investment required to implement a change. Costs are derived from Means Cost Data, industry publications, and local contractors and equipment suppliers. The NJ SmartStart Building® program incentives savings (where applicable) are included for the appropriate ECM's and subtracted from the installed cost. Maintenance savings are calculated where applicable and added to the energy savings for each ECM. The costs and savings are applied and a simple payback and simple return on investment (ROI) is calculated. The simple payback is based on the years that it takes for the savings to pay back the net installation cost (Net Installation divided by Net Savings.) A simple return on investment is calculated as the percentage of the net installation cost that is saved in one year (Net Savings divided by Net Installation.)

A simple life-time calculation is shown for each ECM. The life-time for each ECM is estimated based on the typical life of the equipment being replaced or altered. The energy savings is extrapolated throughout the life-time of the ECM. The total energy savings is calculated as the total life-time multiplied by the yearly savings.

III. HISTORIC ENERGY CONSUMPTION/COST

A. Energy Usage / Tariffs

Electric

Table 3 and Figure 1 represent the electrical usage for the surveyed facility from September-08 to August-09. Atlantic City Electric Utility provides electricity to the facility under the MGS (Monthly General Service) rate. The electric utility measures consumption in kilowatt-hours (KWH) and maximum demand in kilowatts (KW). One KWH usage is equivalent to 1000 watts running for one hour. One KW of electric demand is equivalent to 1000 watts running at any given time. The basic usage charges are shown as generation service and delivery charges along with several non-utility generation charges. Rates used in this report reflect the historical data received for the facility.

Natural Gas

Table 4 and Figure 2 show the natural gas energy usage from August-08 to July-09. South Jersey Gas supplies the natural gas utilizing the GSG rate schedule and delivers the fuel to the burner under the firm transportation rate at the facility. The gas utility measures consumption in cubic feet x 100 (CCF), and converts the quantity into Therms of energy. One Therm is equivalent to 100,000 BTUs of energy. Below is the average unit cost for the utilities at this facility.

Description	Average
Electricity	17.4¢ / kWh (5.09¢ / kBtu)
*Natural Gas	$1.58 / therm (1.58¢ / kBtu)

*Note: The Natural Gas cost per Therm includes customer service charges.

Table 3
Electricity Billing Data

Utility Provider: ACE, MGS (Acct. #1248989-999-8, 0408975-9999-5, 0320545-9987-6, 0483876-9998

MONTH OF USE	CONSUMPTION KWH	DEMAND	TOTAL BILL
Sep-08	6,308	31.51	$1,170
Oct-08	6,066	31.52	$1,119
Nov-08	4,733	25.38	$788
Dec-08	5,827	19.06	$912
Jan-09	7,148	42.84	$1,171
Feb-09	8,360	50.86	$1,364
Mar-09	7,660	44.16	$1,258
Apr-09	5,988	41.99	$999
May-09	5,232	46.55	$888
Jun-09	4,171	47.11	$750
Jul-09	4,334	48.31	$887
Aug-09	5,618	32.17	$1,129
Totals	**71,445**	**50.9 Max**	**$12,433**

AVERAGE DEMAND 38.5 KW average
AVERAGE RATE $0.174 $/kWh

Figure 1
Electricity Usage Profile

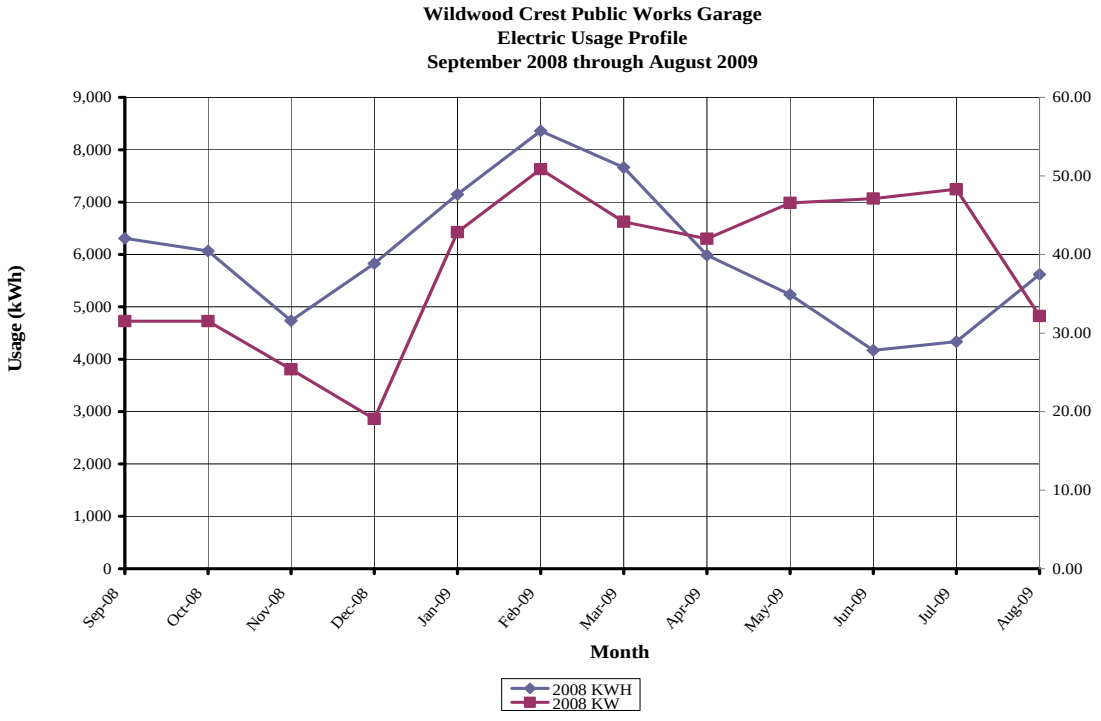
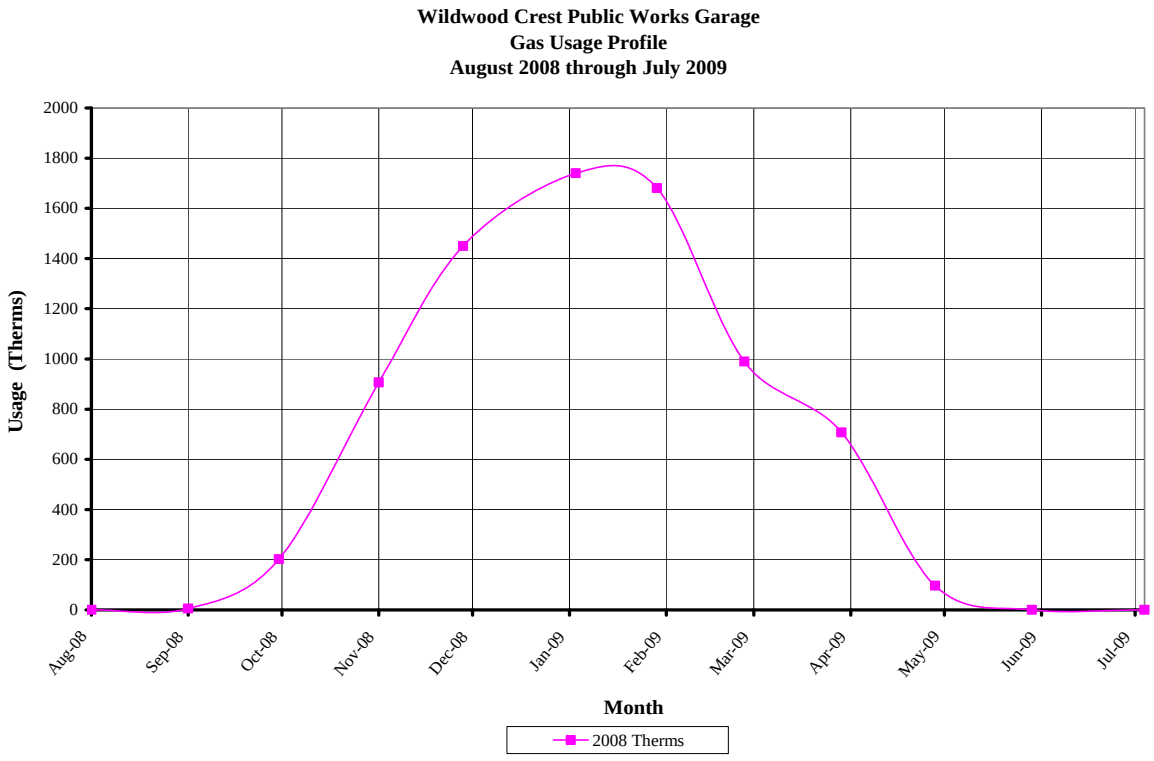


Table 4
Natural Gas Billing Data

Utility Provider: SJ Gas - Rate - GSG, (Meter #0456193)		
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Aug-08	0.00	$17
Sep-08	5.18	$28
Oct-08	202.27	$279
Nov-08	906.50	$1,085
Dec-08	1,450.09	$2,337
Jan-09	1,740.48	$2,838
Feb-09	1,681.13	$2,739
Mar-09	989.76	$1,620
Apr-09	707.61	$1,167
May-09	96.26	$175
Jun-09	0.00	$17
Jul-09	0.00	$20
TOTALS	**7,779.28**	**$12,325**
AVERAGE RATE:	**$1.58**	**$/THERM**

Figure 2
Natural Gas Usage Profile



B. Energy Use Intensity (EUI)

Energy Use Intensity (EUI) is a measure of a building's annual energy utilization per square foot of building. This calculation is completed by converting all utility usage consumed by a building for one year, to British Thermal Units (BTU) and dividing this number by the building square footage. EUI is a good measure of a building's energy use and is utilized regularly for comparison of energy performance for similar building types. The Oak Ridge National Laboratory (ORNL) Buildings Technology Center under a contract with the U.S. Department of Energy maintains a Benchmarking Building Energy Performance Program. The ORNL website determines how a building's energy use compares with similar facilities throughout the U.S. and in a specific region or state.

Source use differs from site usage when comparing a building's energy consumption with the national average. Site energy use is the energy consumed by the building at the building site only. Source energy use includes the site energy use as well as all of the losses to create and distribute the energy to the building. Source energy represents the total amount of raw fuel that is required to operate the building. It incorporates all transmission, delivery, and production losses, which allows for a complete assessment of energy efficiency in a building. The type of utility purchased has a substantial impact on the source energy use of a building. The EPA has determined that source energy is the most comparable unit for evaluation purposes and overall global impact. Both the site and source EUI ratings for the building are provided to understand and compare the differences in energy use.

The site and source EUI for this facility is calculated as follows. (See Table 5 for details):

$$Building\ Site\ EUI = \frac{(Electric\ Usage\ in\ kBtu + Gas\ Usage\ in\ kBtu)}{Building\ Square\ Footage}$$

$$Building\ Source\ EUI = \frac{(Electric\ Usage\ in\ kBtu\ X\ SS\ Ratio + Gas\ Usage\ in\ kBtu\ X\ SS\ Ratio)}{Building\ Square\ Footage}$$

Table 5
Public Works Garage EUI Calculations

ENERGY TYPE	BUILDING USE			SITE ENERGY	SITE-SOURCE	SOURCE ENERGY
	kWh	Therms	Gallons	kBtu	RATIO	kBtu
ELECTRIC	71,445			243,913	3.340	814,670
NATURAL GAS		7,779.28		777,928	1.047	814,491
FUEL OIL			0.00	0	1.010	0
PROPANE			0.00	0	1.010	0
TOTAL				1,021,841		1,629,161
*Site - Source Ratio data is provided by the Energy Star Performance Rating Methodology for Incorporating Source Energy Use document issued Dec 2007.						
BUILDING AREA		8,650		SQUARE FEET		
BUILDING SITE EUI		118.13		kBtu/SF/YR		
BUILDING SOURCE EUI		**188.34**		**kBtu/SF/YR**		

C. EPA Energy Benchmarking System

The United States Environmental Protection Agency (EPA) in an effort to promote energy management has created a system for benchmarking energy use amongst various end users. The benchmarking tool utilized for this analysis is entitled Portfolio Manager. The Portfolio Manager tool allows you to track and assess energy consumption via the template forms located on the ENERGY STAR website (www.energystar.gov). The importance of benchmarking for local government municipalities is becoming more important as utility costs continue to increase and more emphasis is being placed throughout multiple arenas on carbon reduction, greenhouse gas emissions and other environmental impacts.

Based on information gathered from the ENERGY STAR website, Government agencies spend more than $10 billion a year on energy to provide public services and meet constituent needs. Furthermore, energy use in commercial buildings and industrial facilities is responsible for more than 50 percent of U.S. carbon dioxide emissions. Therefore, it is vital that local government municipalities assess their energy usage, benchmark this usage utilizing Portfolio Manager, set priorities and goals to lessen their energy usage and move forward with these priorites and goals. Saving energy will in-turn save the environment.

In accordance with the Local Government Energy Audit Program, CEG has created an Energy Star account for the municipality in order to allow access to monitor their yearly energy usage as it compares to facilities of similar type. The login page for the account can be accessed at the following web address; the username and password are also listed below:

https://www.energystar.gov/istar/pmpam/index.cfm?fuseaction=login.login

User Name:	wildwoodcrestboro
Password:	lgeaceg09012
Security Question:	What is your birth city?
Security Answer:	“Wildwood Crest”

Utilizing the utility bills and other information gathered during the energy audit process, CEG entered the respective data into Portfolio Manager and the following is a summary of the results:

Table 6
ENERGY STAR Performance Rating

FACILITY DESCRIPTION	ENERGY PERFORMANCE RATING	NATIONAL AVERAGE
Public Works Garage	N/A	N/A

* N/A Due to building category, see below.

Specific building types are detailed on the ENERGY STAR website. Non-typical buildings are covered by an "Other" category. The "Other" category is used if your building type or a section of the building is not represented by one of the specific categories. An Energy Star Performance Rating cannot be calculated if more then 10% of a building is classified as "Other," or if the building is an office with less than 5,000 square feet of floor space.

Due to the classification of the Public Works Garage, an Energy Star Performance Rating could not be calculated. Despite this, the Portfolio Manager calculates the Building Source Energy Use Intensity (EUI).

The (EUI) is also an important tool that can be used to track the energy efficiency of the building. Baselines for improvement can be set that the municipality can strive to meet. CEG recommends that the Borough of Wildwood Crest keep their Portfolio Manager account up to date to monitor the performance of the building.

The EUI calculated in the previous section and in the Energy Star Portfolio Manager is a good indicator of the energy performance of this facility in the absence of the Energy Star Performance Rating.

The Public Works Garage has a Building Source EUI of 188.34 rating for this type of facility. The lower the EUI the less energy the facility uses per squarefoot. A low EUI indicates a more efficient building. There maybe some opportunity for improvement making the facility more energy efficient and saving more on the utility costs.

Note: The Oak Ridge National Laboratory does not have a Source EUI Chart for Public Works Garages.

Refer to Appendix D for detailed energy benchmarking report entitled "STATEMENT OF ENERGY PERFORMANCE."

IV. FACILITY DESCRIPTION

The Wildwood Crest public Works facility consists of an original "Butler" style metal building, 80 ft x 80ft. x 16' tall, constructed originally is 1971. The main garage is partitioned into two large spaces, a Mechanical Shop and a Main Garage area, and also includes a small office area, office restroom, Landscaper shop, and Break area with restroom. The building envelope has 1" fiber insulation, providing only minimal protection against condensation.

Two extensions, 25ft x 40ft each, have been added in the past 4-6 years and contain the Carpenter shop and a space for Public Safety personel. The extensions are also metal buildings but were constructed with 2x6 frame walls with 6" insulation and 12" insulation in the ceiling.

Heating and Cooling Equipment

Heating and cooling equipment for this facility is unitary in nature, that is, no central systems exist. The two large garage areas are heated with gas-fired unit heaters, 80,000 and 160,000 btuh input, each with flue to roof. The office area is serviced by electric baseboard heat and a 1 ton window air conditioner. The Landscapers shop is equipped with a small ventless gas heater and a 1 ton window air conditioner. The Carpenter shop has a 2 ton window air conditioner and a gas-fired heater. The Public Safety extension has electric heat and a 2 ton window air conditioner.

Domestic Hot Water

An electric Hot Water Heater, located in the break area restroom provides hot water for the facility. It is a standard 30 gallon unit.

Lighting System

Typical lighting used throughout the buildings consisted of 4-foot and 8-foot fluorescent tube fixtures with T-12 lamps and pendant hung metal halide fixtures. Some fluorescent fixtures were not functioning properly and appeared to require repair. Standard switching is utilized and there are no other types of lighting controls present.

The exterior lighting is a combination of building mounted high intensity discharge wall mounted fixtures and utility company owned and maintained pole mounted fixtures.

Refer to Appendix E for a detailed Investment Grade Lighting Audit.

V. MAJOR EQUIPMENT LIST

Following the completion of the field survey a detailed equipment list was created. The equipment within this list is considered major energy consuming equipment whose replacement could yield substantial savings. In addition, the list shows the major equipment in the facility and all pertinent information utilized in energy savings calculations. An approximate age was assigned to the equipment if a manufacturers date was not shown on the equipment's nameplate. The ASHRAE service life for the equipment along with the remaining useful life is also shown in the Appendix.

Equipment denoted by an asterisk indicates an estimate of the equipment ratings due to equipment inaccessibility, worn nameplates, lack of nameplates, etc.

Refer to Appendix C for the Major Equipment List for this facility.

VI. ENERGY CONSERVATION MEASURES (ECM)

ECM #1: Lighting Upgrade - General

Description:

CEG recommends replacement of the existing T12 lamps and ballasts with the latest technology T8 lamps and high efficiency electronic ballasts. The new energy efficient T8 lamps will provide adequate lighting and will save electrical costs due to improved performance of the lamps and ballasts. Maintenance savings will be realized by reducing the number of lamps replaced per year. The expected lamp life of a T8 lamp is approximately 30,000 burn-hours, in comparison to the existing T12 lamps which are approximately 20,000 burn-hours. The facility will need approximately 33% fewer lamp replacements per year.

Also, single electronic ballasts can operate up to four lamps, while the existing magnetic ballasts can only operate up to two lamps. The number of ballasts in the facility could be reduced by "tandem wiring" electronic ballasts. Single electronic ballasts may be wired to operate up to four lamps in two or more fixtures.

Existing egress fixtures shall be excluded from this ECM so that the current egress light levels are maintained.

Energy Savings Calculations:

A detailed Investment Grade Lighting Audit can be found in Appendix E that outlines the proposed retrofits, costs, savings, and payback periods.

NJ Smart Start® Program Incentives are calculated as follows:

From the Smart Start Incentive appendix, the retrofit of a T-12 fixture with T-5 or T-8 lamps and electronic ballasts warrants the following incentive: T-5 or T-8 (1-2 lamp) = $10 per fixture; T-5 or T-8 (3-4 lamp) = $20 per fixture.

Smart Start Incentive = *(# of 1-2 lamp fixtures x $10) + (# of 3-4 lamp fixtures x $20)*

Smart Start Incentive = *((7)-2 lamp fixtures x $10) + ((1)-4 lamp fixture x $20)= $90*

Maintenance Savings are calculated as follows:

Maintenance Savings = *(reduction in lamps replaced per year) x (replacement $ per lamp + labor $ per lamp)*

Maintenance Savings = *(22 lamps per year) x ($2.00 + $5.00) =$154*

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	**$1,393**
NJ Smart Start Equipment Incentive ($):	**($90)**
Net Installation Cost ($):	**$1,303**
Maintenance Savings ($ / yr):	**-**
Energy Savings ($ / yr):	**$257**
Net Savings ($ / yr):	**$257**
Simple Payback (yrs):	**5.1**
Simple Return On Investment (%):	**20 %**
Simple Lifetime ROI (%):	**2.3 %**
Estimated ECM Lifetime (yr):	**16.5**
Simple Lifetime Savings ($):	**$4,241**

- ECM#1 Calculations DO NOT include lighting control changes implemented in ECM#2.
- If ECM#1 and #2 are implemented together the savings will be relatively lower than shown above.

ECM #2: Install Lighting Controls

Description:

In some areas the lighting is left on unnecessarily. In many cases the lights are left on because of the inconvenience to manually switch lights off when a room is left or on when a room is first occupied. This is common in storage rooms that are occupied for only short periods and only a few times per day. In some instances lights are left on due to the misconception that it is better to keep the lights on rather than to continuously switch lights on and off. Although increased switching reduces lamp life, the energy savings outweigh the lamp replacement costs. The payback timeframe for when to turn the lights off is approximately two minutes. If the lights are off for at least a two minute interval, then it pays to shut them off.

Lighting controls come in many forms. Sometimes an additional switch is adequate to provide reduced lighting levels when full light output is not needed. Occupancy sensors detect motion and will switch the lights on when the room is occupied. Occupancy sensors can either be mounted in place of a current wall switch, or on the ceiling to cover large areas. Photocell control senses light levels and turn off or reduce lights when there is adequate daylight. Photocells are mostly used outside, but are becoming more popular in energy-efficient interior lighting designs as well.

ASHRAE Standard 90.1-2004, Appendix G is a reference standard for modeling building efficiency. The standard estimates that lighting controls provide a 10% reduction in lighting power usage for daytime occupancies in buildings over 5,000 SF, and 15% reduction in buildings under 5,000 SF.

The "Investment Grade Lighting Audit" appendix of this report includes the summary of lighting controls implemented in this ECM and outlines the proposed controls, costs, savings, and payback periods. The calculations adjust the lighting power usage by 10% for all areas that include occupancy sensor lighting controls.

CEG would recommend the replacement of standard wall switches with sensor wall switches for individual rooms, ceiling mount sensors for large office areas or restrooms, and fixture mount box sensors for some applications. Sensors shall be manufactured by Sensorswitch, Watt Stopper or equivalent.

Energy Savings Calculations:

From Appendix E of this report, we calculated the annual kilowatt hours (kwh) savings for the areas where the proposed occupancy sensors will be located:

Energy Savings = *Total kilowatt Hours per year (kWh/yr) of Occupancy Sensor Controlled Area x Average Electric Cost ($/kWh) x 10% Energy Savings:*

= 951.9 kwh/yr. x $0.174/kWh x 10%

Annual Savings = $16.56 / yr

Installation cost per dual-technology sensor (Basis: Sensorswitch or equivalent) is $75/unit including material and labor.

Installation Cost = $75 x 2 motion sensors = $150

NJ Smart Start® Program Incentives are calculated as follows:

From the NJ Smart Start appendix, the installation of a lighting control device warrants an incentive of $20 per occupancy sensor.

Smart Start Incentive = *(# of Occupancy Sensors x $20)*

Smart Start Incentive = *(2 x $20) = $40*

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	**$150**
NJ Smart Start Equipment Incentive ($):	**($40)**

Net Installation Cost ($):	**$110**
Maintenance Savings ($ / yr):	**$0**
Energy Savings ($ / yr):	**$17**
Net Savings ($ / yr):	**$17**
Simple Payback (yrs):	**6.5**
Simple Return On Investment (%):	**15 %**
Simple Lifetime ROI (%):	**1.3 %**
Estimated ECM Lifetime (yr):	**15**
Simple Lifetime Savings ($):	**$255**

ECM #3: Shop Heater Replacements - Infrared Heaters

Description:

This ECM includes the heating systems for the Public Works Garage building.

The large interior spaces of the Public Works Garage are heated by two gas-fired unit heaters hung from the ceiling. These units do not provide adequate heating because of the high ceilings and losses through garage doors when open.

Our team recommends replacing the existing unit heaters with low intensity infrared (IR) tube heaters. When compared to convective heating systems, IR heaters provide more efficient heating in large areas and warehouses for two reasons: they only heat people and objects (not air); they can be conveniently located and directed to provide heat to only a smaller section occupied by workers.

Energy Savings Calculations:

Based on the existing unit heater data and natural gas bills, the total energy consumed for heating these spaces is approximately 80% of the total gas bill, or 6223 Therms/Year. The total rated heat capacity of the IR tubes is 80% of the current load or 0.8 x 6223 Therms = 4978 Therms/Year. The total amount of IR heaters and their size can be estimated based on the current heat load and building layout. In general, a building 200 feet wide or less will require two rows of tubes. Heat output of each 20-foot section is approximately 60,000 Btu/hr.

Estimated Fan Energy Savings:

Each of the gas-fired unit heaters have an approximate 1/4 HP fan that runs each time the unit calls for heating. Assuming that these motors are 80% efficient and the total run hours is 2,800, this equates to an electrical savings of:

Existing ¼ HP Motor Operating Cost = {0.746 Watt/HP x Motor HP x Load Factor x Hours of Operation x Cost of Electricity] ÷ Motor Efficiency = [0.746 x 0.25 x 0.75 x 2,800 x 0.181] ÷ 0.80 = $89 / Year

Based on two (2) existing units, this equates to 2 x $89 = $179/Year Savings

Natural Gas Energy Savings:

20% savings x 6223 Therms/Yr x $1.58/Therm = $1966/Year

Total Energy Savings = Fan Energy Savings + Natural Gas Savings
= $179 + $1966 = $2145 per year

The total implementation cost including material and labor is estimated at approximately $21,500. It is pertinent to note, the labor cost includes installation of the infra-red heaters and required modifications of the existing natural gas piping.

Energy Savings Summary:

ECM #3 – ENERGY SAVINGS SUMMARY	
Installation Cost ($):	**$21,500**
NJ Smart Start Equipment Incentive ($):	**($0)[A]**
Maintenance Savings ($):	**($0)**
Net Installation Cost ($):	**$21,500**
Total Energy Savings ($ / yr):	**$2,145**
Estimated ECM Lifetime (yrs):	**13**
Simple Lifetime Energy Savings ($):	**$6385**
Simple Payback (yrs):	**10**
Simple Return on Investment:	**7.7 %**

Note: A. CEG believes that a NJ Smart Start® Custom Measure incentive could be applied for in order to offset the installation cost. However, further study is required.

VIII. RENEWABLE/DISTRIBUTED ENERGY MEASURES

Globally, renewable energy has become a priority affecting international and domestic energy policy. The State of New Jersey has taken a proactive approach, and has recently adopted in its Energy Master Plan a goal of 30% renewable energy by 2020. To help reach this goal New Jersey created the Office of Clean Energy under the direction of the Board of Public Utilities and instituted a Renewable Energy Incentive Program to provide additional funding to private and public entities for installing qualified renewable technologies. A renewable energy source can greatly reduce a building's operating expenses while producing clean environmentally friendly energy. CEG has assessed the feasibility of installing renewable energy technologies for the Wildwood Crest Public Works Garage, to evaluate if there is any potential for solar or wind energy generation.

Solar energy produces clean energy and reduces a building's carbon footprint. This is accomplished via photovoltaic panels which will be mounted on all south and southwestern facades of the building. Flat roof, as well as sloped areas can be utilized; flat areas will have the panels turned to an optimum solar absorbing angle. (A structural survey of the roof would be necessary before the installation of PV panels is considered). Parking lots can also be utilized for the installation of a solar array. A truss system can be installed that is high enough to park a vehicle under the array, this way no parking lot area is lost. The state of NJ has instituted a program in which one Solar Renewable Energy Certificate (SREC) is given to the Owner for every 1000 kWh of generation. SREC's can be sold anytime on the market at their current market value. The value of the credit varies upon the current need of the power companies. The average value per credit is around $350, this value was used in our financial calculations. This equates to $0.35 per kWh generated.

CEG has reviewed the existing roof area of the building being audited for the purposes of determining a potential for a roof mounted photovoltaic system. Due to the corrugated light panels on the garage, and the limited flat roof area facing south, it is our opinion that a roof mounted, PV Solar Panel system is not feasible for the building roof.

Refer to Appendix F for an aerial photo of the building.

In addition to the Solar Analysis, CEG also conducted a review of the applicability of wind energy for the facility. Wind energy production is another option available through the Renewable Energy Incentive Program. Wind turbines of various types can be utilized to produce clean energy on a per building basis. Cash incentives are available per kWh of electric usage. Based on CEG's review of the applicability of wind energy for the facility, it was determined that the average wind speed is not adequate, and the kilowatt demand for the building is below the threshold (200 kW) for purchase of a commercial wind turbine. Therefore, wind energy is not a viable option to implement.

IX. ENERGY PURCHASING AND PROCUREMENT STRATEGY

Load Profile:

Load Profile analysis was performed to determine the seasonal energy usage of the facility. Irregularities in the load profile will indicate potential problems within the facility. Consequently based on the profile a recommendation will be made to remedy the irregularity in energy usage. For this report, the facility's energy consumption data was gathered in table format and plotted in graph form to create the load profile. Refer to the Electric and Natural Gas Usage Profiles included within this report to reference the respective electricity and natural gas usage load profiles.

Electricity:

This facility is said to be "unitary". It does not have any central systems.
The Electric Usage Profile demonstrates a fairly atypical electric load profile. This is due to the fact that the winter load profile (November – April) demonstrates increased consumption. Typically the summer would demonstrate increased consumption due to air conditioning load. The increased winter electric load is due in part to the presence of electric baseboard heaters in the Office. Electric baseboard heaters are also present in the Public Safety extension. Domestic hot-water is supplied by a 30 gallon electric Hot Water Heater. Air conditioning is provided by (2) two, 1 ton window air conditioners and (2), two 2 ton window air conditioners. A Flatter load profile, will allow for more competitive energy prices when shopping for alternative suppliers.

Natural Gas:

The Natural Gas Usage Profile demonstrates a typical natural gas (heat load) profile. The months (October– April) demonstrate an extremely high natural gas load profile. This is in part due to the fact that the two large garage areas are heated with gas-fired unit heaters. There is also the presence of a small ventless gas heater in the Landscapers Shop and a small gas fired heater in the Carpenter Shop. A base-load shaping (flat) will secure more competitive energy prices when procuring energy through an alternative energy source.

Tariff Analysis:

Electricity:

This facility receives electrical Delivery Service from Atlantic City Electric on a MGS Secondary (Monthly General Service) utility rate. This rate is available at any point of Company's system where facilities of adequate character and capacity exist for the entire electric service requirements of any customer delivered at one point and metered at or compensated to the voltage of delivery. This schedule is not available to residential customers. This service includes the following charges: Delivery Service Charges, Distribution Demand Charges, Reactive Demand Charges, Non-Utility Generation Charges, Societal Benefits Charges, Regulatory Assets Recovery Charges, Transition Bond Charges, Market Transition Charge Tax,

Transmission Demand Charge, Regional Greenhouse Gas Initiative Recovery Charge, and Infrastructure Investment Surcharge.

This facility receives electrical supply service through Atlantic City Electric on a BGS (Basic Generation Service) rate. Since the passing and implementation of the Electricity Discount and Energy Competition Act (EDECA) in 1999, there have been many changes brought about by the deregulation of the electric industry in New Jersey. Since that time, customers in New Jersey have been able to choose their electrical supplier. Customers who do not choose to switch to a Third Party Supplier (TPS), or who leave a TPS to return to their Electric Delivery Company are supplied with Basic Generation Service. Beside the commodity itself, BGS also has the following charges: System Control Charge, CIEP Standby Fee, Transmission Enhancement Charge and Basic Generation Service Charge.

Natural Gas:

This facility is serviced by South Jersey Gas Company (SJG) on its Firm Delivery rate (GSG) General Service Gas from the utility and BGSS (Basic Generation Supply Service) when not being served by a Third Party Supplier (TPS). This Delivery Rate has the following charges: Customer Charge, Delivery Charge, BSC Volume Charge and Commodity Charge under this rate structure. The BGSS Supply rates are designed to recover SJG's cost of gas applicable to customers who purchase gas from SJG. The company earns no profit from BGSS. BGSS consists of (2) two pricing mechanisms: Residential and Commercial customers that use less than 5,000 therms annually and Commercial and Industrial customers that consume at least 5,000 therms annually.

Imbalances occur when Third Party Suppliers (TPS) are used to supply natural gas and full-delivery is not made, and when a new supplier is contracted or the customer returns to the utility.

Note: It is important when utilizing a Third Party Supplier, that an experienced regional supplier is used otherwise, imbalances can occur, jeopardizing economics and scheduling. If the supplier does not deliver they can be placed on a very costly rate. A customer can automatically be put on an alternative supply rate by the utility.

A "firm account" refers to the type of interstate pipeline service that the utility has subscribed for and delivered on behalf of the customer. Much like the telecom industry, the pipeline space (capacity) has been deregulated. The pipeline capacity is broken down into reliability of service. "Firm service" is the highest level of reliability and is the last, in pecking order, for interruption.

Recommendations:

CEG recommends a global approach that will be consistent with all facilities within the township. The primary area for potential improvement is seen in the electric costs. The average price per kWh (kilowatt hour) for all buildings based on 1-year historical average price is $.1294/kWh (this is the average "price to compare" if the client intends to shop for energy). The average price per decatherm for natural gas is $ 11.83 / dth (dth, is the common unit of measure). Energy commodities are among the most volatile of all commodities, however at this point and

time, energy is extremely competitive. The borough could see improvement in its energy costs if it were to take advantage of these current market prices quickly, before energy prices increase. Based on annual historical consumption (September 2008 through August 2009) and current electric rates, the township could see an improvement in its electric costs of up to 26 % annually. (Note: Savings were calculated using Average Annual Consumption and a variance to a Fixed Average One-Year commodity contract). CEG recommends aggregating the entire electric load to gain the most optimal energy costs. CEG recommends advisement for alternative sourcing and supply of energy on a "managed approach".

CEG's secondary recommendation coincides with the boroughs' natural gas costs. Based on the current market, Wildwood Crest could improve its natural gas costs by up to 26 %. Currently the township is utilizing the services of the utility. CEG recommends advisement on energy prices through an energy advisor. They should also consider procuring energy (natural gas) through an alternative supply source.

CEG also recommends scheduling a meeting with the current utility providers to review their utility charges and current tariff structures for electricity and natural gas. This meeting would provide insight regarding alternative procurement options that are currently available. Through its meeting with the Local Distribution Company (LDC), the municipality can learn more about the competitive supply process. The borough can acquire a list of approved Third Party Suppliers from the New Jersey Board of Public Utilities website at www.nj.gov/bpu. They should also consider using a billing-auditing service to further analyze the utility invoices, manage the data and use the information for ongoing demand-side management projects. Furthermore, special attention should be given to credit mechanisms, imbalances, balancing charges and commodity charges when meeting with the utility representative. The borough should ask the utility representative about alternative billing options, such as consolidated billing when utilizing the service of a Third Party Supplier. Finally, if the supplier for energy (natural gas) is changed, closely monitor balancing, particularly when the contract is close to termination. This could be performed with the aid of an "energy advisor".

X. INSTALLATION FUNDING OPTIONS

CEG has reviewed various funding options for the Owner to utilize in subsidizing the costs for installing the energy conservation measures noted within this report. Below are a few alternative funding methods:

i. *Energy Savings Improvement Program (ESIP)* – Public Law 2009, Chapter 4 authorizes government entities to make energy related improvements to their facilities and par for the costs using the value of energy savings that result from the improvements. The "Energy Savings Improvement Program (ESIP)" law provides a flexible approach that can allow all government agencies in New Jersey to improve and reduce energy usage with minimal expenditure of new financial resources.

ii. *Municipal Bonds* – Municipal bonds are a bond issued by a city or other local government, or their agencies. Potential issuers of municipal bonds include cities, counties, redevelopment agencies, school districts, publicly owned airports and seaports, and any other governmental entity (or group of governments) below the state level. Municipal bonds may be general obligations of the issuer or secured by specified revenues. Interest income received by holders of municipal bonds is often exempt from the federal income tax and from the income tax of the state in which they are issued, although municipal bonds issued for certain purposes may not be tax exempt.

iii. *Power Purchase Agreement* – Public Law 2008, Chapter 3 authorizes contractor of up to fifteen (15) years for contracts commonly known as "power purchase agreements." These are programs where the contracting unit (Owner) procures a contract for, in most cases, a third party to install, maintain, and own a renewable energy system. These renewable energy systems are typically solar panels, windmills or other systems that create renewable energy. In exchange for the third party's work of installing, maintaining and owning the renewable energy system, the contracting unit (Owner) agrees to purchase the power generated by the renewable energy system from the third party at agreed upon energy rates.

CEG recommends the Owner review the use of the above-listed funding options in addition to utilizing their standard method of financing for facilities upgrades in order to fund the proposed energy conservation measures.

XI. ADDITIONAL RECOMMENDATIONS

The following recommendations include no cost/low cost measures, Operation & Maintenance (O&M) items, and water conservation measures with attractive paybacks. These measures are not eligible for the Smart Start Buildings incentives from the office of Clean Energy but save energy none the less.

A. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.

B. Maintain all weather stripping on windows and doors.

C. Clean all light fixtures to maximize light output.

D. Provide more frequent air filter changes to decrease overall fan horsepower requirements and maintain better IAQ.

E. Confirm that outside air economizers on the rooftop units that serve the Office Areas are functioning properly to take advantage of free cooling.

In addition to the recommendations above, implementing Retro-Commissioning would be beneficial for this facility. Retro-Commissioning is a means to verify your current equipment is operating at its designed efficiency, capacity, airflow, and overall performance. Retro-Commissioning provides valuable insight into systems or components not performing correctly or efficiently. The commissioning process defines the original system design parameters and recommends revisions to the current system operating characteristics.

APPENDIX

Wildwood Crest Public Works

CONSTRUCTION COST AND REBATES					
ECM # 1 - UPGRADE THE LIGHTING	Qty	Unit Cost $	Material $	Labor $	Total $
New T-8 & CFL Lamps & Ballasts	1	$571	$571	$1,546	$2,117
Total Cost					$2,117
Utility Incentive					-$580
Total Net Cost					**$1,537**
ECM # 2 - INSTALL LIGHTING CONTROLS	Qty	Unit Cost $	Material $	Labor $	Total $
Occupancy Sensors	24	$75	$1,800	$0	$1,800
Total Cost					$1,800
Utility Incentive					-$480
Total Net Cost					**$1,320**
ECM # 2 SHOP HEATER REPLACEMENT - INFRARED HEATERS	Qty	Unit Cost $	Material $	Labor $	Total $
Infrared Heaters	4	$1,500	$6,000	$12,000	$18,000
Gas Piping extend	4	$250	$1,000	$2,000	$3,000
Demo existing heaters	2	$250	$0	$500	$500
Total					**$21,500**

Concord Engineering Group, Inc.

520 BURNT MILL ROAD
VOORHEES, NEW JERSEY 08043
PHONE: (856) 427-0200
FAX: (856) 427-6508

SmartStart Building Incentives

The NJ SmartStart Buildings Program offers financial incentives on a wide variety of building system equipment. The incentives were developed to help offset the initial cost of energy-efficient equipment. The following tables show the current available incentives as of January, 2009:

Electric Chillers

Water-Cooled Chillers	$12 - $170 per ton
Air-Cooled Chillers	$8 - $52 per ton

Gas Cooling

Gas Absorption Chillers	$185 - $400 per ton
Gas Engine-Driven Chillers	Calculated through custom measure path)

Desiccant Systems

	$1.00 per cfm – gas or electric

Electric Unitary HVAC

Unitary AC and Split Systems	$73 - $93 per ton
Air-to-Air Heat Pumps	$73 - $92 per ton
Water-Source Heat Pumps	$81 per ton
Packaged Terminal AC & HP	$65 per ton
Central DX AC Systems	$40- $72 per ton
Dual Enthalpy Economizer Controls	$250

Ground Source Heat Pumps

Closed Loop & Open Loop	$370 per ton

Gas Heating

Gas Fired Boilers < 300 MBH	$300 per unit
Gas Fired Boilers ≥ 300 - 1500 MBH	$1.75 per MBH
Gas Fired Boilers ≥1500 - ≤ 4000 MBH	$1.00 per MBH
Gas Fired Boilers > 4000 MBH	(Calculated through Custom Measure Path)
Gas Furnaces	$300 - $400 per unit

Variable Frequency Drives

Variable Air Volume	$65 - $155 per hp
Chilled-Water Pumps	$60 per hp
Compressors	$5,250 to $12,500 per drive

Natural Gas Water Heating

Gas Water Heaters ≤ 50 gallons	$50 per unit
Gas-Fired Water Heaters >50 gallons	$1.00 - $2.00 per MBH
Gas-Fired Booster Water Heaters	$17 - $35 per MBH

Premium Motors

Three-Phase Motors	$45 - $700 per motor

Prescriptive Lighting

T-5 and T-8 Lamps w/Electronic Ballast in Existing Facilities	$10 - $30 per fixture, (depending on quantity)
Hard-Wired Compact Fluorescent	$25 - $30 per fixture
Metal Halide w/Pulse Start	$25 per fixture
LED Exit Signs	$10 - $20 per fixture
T-5 and T-8 High Bay Fixtures	$16 - $284 per fixture

Lighting Controls – Occupancy Sensors

Wall Mounted	$20 per control
Remote Mounted	$35 per control
Daylight Dimmers	$25 per fixture
Occupancy Controlled hi-low Fluorescent Controls	$25 per fixture controlled

Lighting Controls – HID or Fluorescent Hi-Bay Controls

Occupancy hi-low	$75 per fixture controlled
Daylight Dimming	$75 per fixture controlled

Other Equipment Incentives

Performance Lighting	$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2004 for New Construction and Complete Renovation
Custom Electric and Gas Equipment Incentives	not prescriptive

Wildwood Crest Public Works Garage

EQUIPMENT LIST

TAG	MAKE	MODEL	TYPE	CAPACITY	EFFICIENCY	SERVES	LOCATION	REMAINING USEFUL LIFE	NOTES
-	LG	STANDARD	WINDOW AC	10,000 BTUH	-	OFFICE	OFFICE	UNKNOWN	
-	GENERIC	GENERIC	ELECTRIC BASEBOARD HEAT'	APPROX. 1500 WATTS	100%	OFFICE	OFFICE	UNKNOWN	W/ THERMOSTAT
-	GENERIC	GENERIC	ELECTRIC BASEBOARD HEAT'	APPROX. 500 WATTS	100%	OFFICE RESTROOM	OFFICE RESTROOM	UNKNOWN	W/ THERMOSTAT
-	GENERIC	GENERIC	GAS-FIRED HORIZONTAL UNIT HEATER	80 MBH INPUT	80%	MECH SHOP	MECH SHOP	5	
-	GENERIC	STANDARD	WINDOW AC	1 TON	-	MECH SHOP OFFICE	MECH SHOP OFFICE	UNKNOWN	
-	DAYTON	-	GAS-FIRED HORIZONTAL UNIT HEATER	160 MBH INPUT	80%	MECH SHOP	MECH SHOP	3	
-	GENERIC	-	GAS-FIRED NO-VENT WALL HEATER	30,000 BTUH INPUT		LANDSCAPER SHOP	LANDSCAPER SHOP	UNKNOWN	
-	GENERIC	STANDARD	WINDOW AC	1 TON	-	LANDSCAPER SHOP	LANDSCAPER SHOP	UNKNOWN	
-	GENERIC	GENERIC	GAS-FIRED CEILING UNIT HEATER	85 MBH INPUT	80%	CARPENTER SHOP	CARPENTER SHOP	5	
-	GENERIC	STANDARD	WINDOW AC	2 TON	-	CARPENTER SHOP	CARPENTER SHOP	UNKNOWN	
-	GENERIC	GENERIC	ELECTRIC HEAT	35,000 BTUH	100%	PUBLIC SAFETY	PUBLIC SAFETY	UNKNOWN	
-	GENERIC	STANDARD	WINDOW AC	2 TON	-	PUBLIC SAFETY	PUBLIC SAFETY	UNKNOWN	
-	AMERICAN	E52-30H-045DV	ELECTRIC DOMESTIC HOT WATER HEATER	30 GALLON, 4500 WATTS	100%	ENTIRE BUILDING	BREAK AREA RESTROOM	0	MFG 1992

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Wildwood Crest Public Works Garage

Building ID: 1854377
For 12-month Period Ending: August 31, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: September 24, 2009

Facility
Wildwood Crest Public Works Garage
9301 Bayview Drive
Wildwood Crest, NJ 08260

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1971
Gross Floor Area (ft²): 8,650

Energy Performance Rating[2] (1-100) N/A

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	243,870
Natural Gas (kBtu)[4]	782,214
Total Energy (kBtu)	1,026,084

Energy Intensity[5]

Site (kBtu/ft²/yr)	119
Source (kBtu/ft²/yr)	189

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	79

Electric Distribution Utility
Atlantic City Electric Co

National Average Comparison

National Average Site EUI	77
National Average Source EUI	150
% Difference from National Average Source EUI	26%
Building Type	Service (Vehicle Repair/Service, Postal Service)

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Certifying Professional
N/A

Meets Industry Standards[6] **for Indoor Environmental Conditions:**

Ventilation for Acceptable Indoor Air Quality	**N/A**
Acceptable Thermal Environmental Conditions	**N/A**
Adequate Illumination	**N/A**

Notes:
1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.
NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Wildwood Crest Public Works Garage	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Service (Vehicle Repair/Service, Postal Service)	Is this an accurate description of the space in question?		☐
Location	9301 Bayview Drive, Wildwood Crest, NJ 08260	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Shop Area (Office)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	2,250 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Weekly operating hours	35 Hours	Is this the total number of hours per week that the Office space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	5	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100. The normal worker density ranges between 0.3 and 10 workers per 1000 square feet (92.8 square meters)		☐
Number of PCs	3	Is this the number of personal computers in the Office?		☐
Percent Cooled	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	50% or more	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Public Works Garage (Other)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑

Gross Floor Area	6,400 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		
Number of PCs	5 (Optional)	Is this the number of personal computers in the space?		
Weekly operating hours	35 Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		
Workers on Main Shift	26 (Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Atlantic City Electric Co

Fuel Type: Electricity

Meter: Electricity (kWh (thousand Watt-hours))
Space(s): Entire Facility
Generation Method: Grid Purchase

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/03/2009	08/02/2009	4,334.00
06/03/2009	07/02/2009	4,171.00
05/03/2009	06/02/2009	5,232.00
04/03/2009	05/02/2009	5,988.00
03/03/2009	04/02/2009	7,660.00
02/03/2009	03/02/2009	8,360.00
01/03/2009	02/02/2009	7,148.00
12/03/2008	01/02/2009	5,827.00
11/03/2008	12/02/2008	4,733.00
10/03/2008	11/02/2008	6,066.00
09/03/2008	10/02/2008	6,308.00
Electricity Consumption (kWh (thousand Watt-hours))		**65,827.00**
Electricity Consumption (kBtu (thousand Btu))		**224,601.72**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**224,601.72**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas

Meter: Gas (therms)
Space(s): Entire Facility

Start Date	End Date	Energy Use (therms)
07/03/2009	08/02/2009	0.00
06/03/2009	07/02/2009	96.26
05/03/2009	06/02/2009	707.61
04/03/2009	05/02/2009	989.76
03/03/2009	04/02/2009	1,681.13
02/03/2009	03/02/2009	1,740.48
01/03/2009	02/02/2009	1,450.09
12/03/2008	01/02/2009	906.50
11/03/2008	12/02/2008	202.27
10/03/2008	11/02/2008	5.18
09/03/2008	10/02/2008	0.00

Gas Consumption (therms)	**7,779.28**
Gas Consumption (kBtu (thousand Btu))	**777,928.00**
Total Natural Gas Consumption (kBtu (thousand Btu))	**777,928.00**
Is this the total Natural Gas consumption at this building including all Natural Gas meters?	☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same as the PE that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility
Wildwood Crest Public Works Garage
9301 Bayview Drive
Wildwood Crest, NJ 08260

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Wildwood Crest Public Works Garage	
Gross Floor Area Excluding Parking: (ft^2)	8,650
Year Built	1971
For 12-month Evaluation Period Ending Date:	August 31, 2009

Facility Space Use Summary

Shop Area	
Space Type	Office
Gross Floor Area(ft^2)	2,250
Weekly operating hours	35
Workers on Main Shift	5
Number of PCs	3
Percent Cooled	50% or more
Percent Heated	50% or more

Public Works Garage	
Space Type	Other - Service (Vehicle Repair/Service, Postal Service)
Gross Floor Area(ft^2)	6,400
Number of PCs[o]	5
Weekly operating hours[o]	35
Workers on Main Shift[o]	26

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 08/31/2009)	**Baseline** (Ending Date 08/31/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft^2)	119	119	39	N/A	77
Source (kBtu/ft^2)	189	189	61	N/A	150
Energy Cost					
$/year	$ 24,685.51	$ 24,685.51	$ 8,020.40	N/A	$ 16,024.15
$/$ft^2$/year	$ 2.85	$ 2.85	$ 0.93	N/A	$ 1.85
Greenhouse Gas Emissions					
$MtCO_2e$/year	79	79	26	N/A	51
$kgCO_2e/ft^2$/year	9	9	3	N/A	6

More than 50% of your building is defined as Service (Vehicle Repair/Service, Postal Service). This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Service (Vehicle Repair/Service, Postal Service). This building uses X% less energy per square foot than the CBECS national average for Service (Vehicle Repair/Service, Postal Service).

Notes:
o - This attribute is optional.
d - A default value has been supplied by Portfolio Manager.

ECM #1: Lighting Upgrade

Appendix E

Public Works Garage

CEG Project #: BS09-012
Project Name : Wildwood Crest Public Works Garage
Address: 9301 Bayview Drive
City, State: Wildwood Crest, NJ 08260
Building SF: 8650

Date 09/23/09
kWh Cost $0.174

	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost			Proposed Ltg Control Annual Savings				
Fixture Location	**Usage, Hrs/Yr**	**Fixt Qty**	**Lighting Fixture Description**	**Total Watts - Location**	**Annual Energy Cost**	**Fixt Qty**	**Lighting Fixture Description**	**Total Watts - Location**	**Energy Savings, Watts**	**Energy Savings, kWh/Yr**	**Savings/Yr, $**	**Simple Payback, Yrs**	**Unit Cost, Installed**	**Total Cost, Installed**	**Rebate Estimate**	**Ltg Control Description**	***Energy Savings kWh/Yr**	**Savings/ Yr $**	****Unit Cost, Total**	**Simple Payback, Yrs**
Public Works Garage																				
Garage #1	1820	7	(2)75w T12 Lamps. 8' Industrial Fixture w/Elec. Ballast - 132w	924	$292.61	7	(2)59w T8 Sylvania Lamps #FO96 - 100w	700	224	408	$70.94	3.0	$30.18	$211.26	$0.00					
	1820	4	***(1)250w Metal Halide Pendant Fixture - 287w	1148	$363.55	4	Existing to Remain	1148	0	0	$0.00		$0.00	$0.00	$0.00					
Garage #2	1820	6	(2)75w T12 Lamps. 8' Industrial Fixture w/Elec. Ballast - 132w	792	$250.81	6	(2)59w T8 Sylvania Lamps #FO96 - 100w	600	192	349	$60.80	3.0	$30.18	$181.08	$0.00					
	910	1	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	77	$12.19	1	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	48	29	26	$4.59	15.0	$79.05	$79.05	$10.00					
	1820	10	***(1)250w Metal Halide Pendant Fixture - 287w	2870	$908.87	10	Existing to Remain	2870	0	0	$0.00		$0.00	$0.00	$0.00					
Supervisors Office	1820	2	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	154	$48.77	2	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	96	58	106	$18.37	7.5	$79.05	$158.10	$20.00					
Office	1820	3	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	231	$73.15	3	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	144	87	158	$27.55	7.5	$79.05	$237.15	$30.00	Dual Technology Occupancy Sensor	42.0	$7.32	$ 55.00	7.5
Break Room	1820	4	(2)34w T12 Lamps. 2' Fixture w/Mag. Ballast - 77w	292	$92.47	4	Existing to Remain	292	0	0	$0.00		$0.00	$0.00	$0.00	Dual Technology Occupancy Sensor	53.1	$9.25	$ 55.00	5.9
Office - Flr 2	910	3	(2)34w T12 Lamps. 2' Fixture w/Mag. Ballast - 77w	219	$34.68	3	Existing to Remain	219	0	0	$0.00		$0.00	$0.00	$0.00					
Landscaper Shop	910	1	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	77	$12.19	1	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	48	29	26	$4.59	15.0	$79.05	$79.05	$10.00					
	910	1	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	154	$24.38	1	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	95	59	54	$9.34	7.0	$85.55	$85.55	$20.00					
Public Works Garage Summary		**42**		**6938**	**$2,114**	**42**		**6260**	**678**	**1,127**	**$196**	**4.8**		**$1,031**	**$90**		**95**	**$17**	**$110**	**6.6**
Carpenter's Shop Building																				
Carpenter's Shop	910	6	(2)75w T12 Lamps. 8' Industrial Fixture w/Elec. Ballast - 132w	792	$125.41	6	(2)59w T8 Sylvania Lamps #FO96 - 100w	600	192	175	$30.40	6.0	$30.18	$181.08	$0.00					
Carpenter's Shop Building Summary		**6**		**792**	**$125**	**6**		**600**	**192**	**175**	**$30**	**6.0**		**$181**	**$0**		**0**	**$0**	**$0**	

	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost			Proposed Ltg Control Annual Savings				
Fixture Location	**Usage, Hrs/Yr**	**Fixt Qty**	**Lighting Fixture Description**	**Total Watts - Location**	**Annual Energy Cost**	**Fixt Qty**	**Lighting Fixture Description**	**Total Watts - Location**	**Energy Savings, Watts**	**Energy Savings, kWh/Yr**	**Savings/Yr, $**	**Simple Payback, Yrs**	**Unit Cost, Installed**	**Total Cost, Installed**	**Rebate Estimate**	**Ltg Control Description**	***Energy Savings kWh/Yr**	**Savings/ Yr $**	****Unit Cost, Total**	**Simple Payback, Yrs**
Public Safety Shop Building																				
Public Safety Shop	910	6	(2)75w T12 Lamps. 8' Industrial Fixture w/Elec. Ballast - 132w	792	$125.41	6	(2)59w T8 Sylvania Lamps #FO96 - 100w	600	192	175	$30.40	6.0	$30.18	$181.08	$0.00					
Public Safety Shop Building Summary		**6**		**792**	**$125**	**6**		**600**	**192**	**175**	**$30**	**6.0**		**$181**	**$0**		**0**	**$0**	**$0**	
	Totals:	**54**		**8522**	**$2,364**	**54**		**7460**	**1062**	**1477**	**$257**	**5.1**		**$1,393**	**$90**		**95**	**$17**	**$110**	**6.6**

COMMENTS:

*Based on ASHRAE Standard 90.1-2004, Appendix G.

**Occupancy Sensor unit cost includes a $20 NJ Smart Start incentive per unit.

***Estimated wattage. Ballast inventory was not available and multiple fixture types were used.

Public Works Garage – Wildwood Crest
9301 Bayview Drive
Wildwood Crest, NJ 08260

↑ **NORTH**