



Constellation®

An Exelon Company

Belmont-Harrison Vocational School District

Annual Measurement and Verification
Report
Year Three

Submitted: October 11, 2017

Submitted to: Belmont-Harrison Vocational
School District
68090 Hammond Road
St. Clairsville, OH 43950

PERFORMANCE PERIOD OF
JULY 1, 2016 - JUNE 30, 2017

**BELMONT-HARRISON VOCATIONAL SCHOOL DISTRICT
ANNUAL MEASUREMENT AND VERIFICATION REPORT**

QUICK VIEW

- 🏠 Excellent project health
- 🏠 Verified savings exceed guaranteed dollar amounts for the third measurement year
- 🏠 Total overachieved savings throughout performance period to-date equates to \$20,256

KEY ACTION ITEMS

- 🏠 Sign and submit annual report to the state of Ohio

KEY DATES

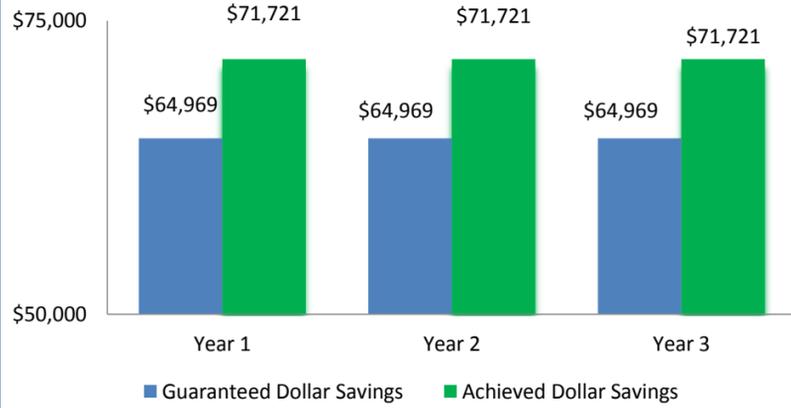
- 🏠 Construction completion July 2014
- 🏠 Third annual site visit performed October 3, 2017

PERFORMANCE PERIOD COSTING

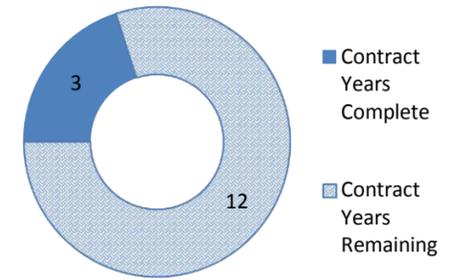
Year	Total Annual Cost
Year 1	\$3,500
Year 2	\$3,623
Year 3	\$3,749

Grayed blocks denote future years.

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Suite 103
Pittsburgh, Pennsylvania
(412) 489-9425
www.constellation.com



Energy Performance Contract Status



October 11, 2017

Mr. Mark Lucas - Treasurer
68090 Hammond Road
St. Clairsville, OH 43950

Dear Mr. Lucas

Constellation NewEnergy, Inc. is pleased to present the enclosed annual Measurement & Verification report to the Belmont-Harrison Vocational School District. Construction for this project was officially completed and accepted by the customer in July 2014. The enclosed report summarizes the savings achieved throughout the third year of operation.

Under the requirements of the Guaranteed Energy Savings Contract(GESC), Constellation has provided and installed the Energy Conservation Measures (ECMs) as proposed through the Investment Grade Audit (IGA) report and the Guaranteed Energy Savings Contract.

Since the projected energy savings for each ECM is dependent upon its design and performance, any variation to those parameters must be documented. Changes to the original design may adversely affect the guaranteed energy savings.

The intent of the enclosed report is to identify, verify, and document the critical parameters for energy savings and establish their compliance with the approved designs set forth in the IGA and GESC documents for all Energy Conservation Measures involved.

I am happy to arrange a convenient time to review this information with you. Should you have any questions about this report or any specific ECM, please contact me utilizing the information listed below.

Sincerely,

Performance Assurance Engineer
(412) 489-9434
adam.campbell@constellation.com



UTILITY RATE DATA

The following table lists the current utility rates that are utilized in savings calculations to determine the annual savings achieved for measurement year three. These utility rates were derived upon the base utility rates and escalation rates as outlined in Schedule A and Schedule D, Exhibit 1 of the Guaranteed Energy Services Contract (GESC), respectively.

Location	Electricity (\$/kWh)	Natural Gas (\$/MCF)	Water & Sewer (\$/kgal)
Belmont Career Center	\$0.08827	\$13.29552	\$10.46271
Harrison Career Center	\$0.08362	-	\$5.84000

ENVIRONMENTAL IMPACT

By utilizing the electric and natural gas energy savings values contained in the enclosed M&V report, Constellation is able to calculate the positive annual environmental impact of the energy conservation measures implemented.



Annual Electricity Saved	Annual Fuel Saved		Annual Tons of CO ₂ Avoided
480,815 kWh	806 MCF	=	443

Avoiding 443 tons of CO₂ is equivalent to the following:

	931	Barrels of oil consumed
	45,250	Gallons of Gasoline
	60	Homes' electricity use for one year
	86	Passenger Vehicles

Source: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

RECOMMENDATIONS

Based upon the observations while performing the annual measurement and verification requirements for Belmont-Harrison Vocational School District, Constellation would like to provide recommendations on a few aspects of the systems utilized, to help maximize the overall efficiency of the project.

Energy Conservation Measure	Savings Indicator	Recommendation
Belmont Lighting Upgrade / Occupancy Sensor		Constellation recommends continuing to maintain the system at its current level for the lighting upgrades. Maximum achievable energy savings for this ECM are dependent upon proper maintenance of the lamps and fixtures. BHVSD facility managers are currently maintaining the ECM well, replacing failures as-needed with equal or lesser power-consuming equipment.
Belmont Water Conservation		No recommendation at this time. The equipment for this ECM remains installed and operating as intended.
Belmont Boiler Replacement		Constellation recommends continuing to maintain the boiler system at its current level. The boilers continue to be inspected annually with the necessary preventative maintenance procedures performed. This helps provide uninterrupted operation throughout the heating season, along with sustainability of the maximum savings potential of this ECM.
Belmont ED Pack Replacement		No M&V associated with this ECM.
Belmont Air Compressor Retro-Commission		No M&V associated with this ECM.
Belmont Fridge/Freezer Air Cooled Condenser Conversion		No M&V associated with this ECM.
Belmont DHW System Replacement		No M&V associated with this ECM.
Harrison Lighting Upgrade / Occupancy Sensor		Constellation recommends continuing to maintain the system at its current level for the lighting upgrades. Maximum achievable energy savings for this ECM are dependent upon proper maintenance of the lamps and fixtures. Harrison Career Center has been maintained well throughout the performance period.
Harrison Air Compressor Retro-Commission		No M&V associated with this ECM.



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Introduction

Constellation NewEnergy, Inc. (CNE) is pleased to present this annual Measurement & Verification Report to the Belmont-Harrison Career Center.

Under the requirements of the guaranteed energy service agreement, Constellation has provided and installed the Energy Conservation Measures (ECMs) as proposed through the IGA report and the Guaranteed Energy Savings Contract.

Since the projected energy savings for each ECM is dependent upon its design and performance, any variation to those parameters need to be documented. Any changes to the original design may adversely affect the proposed energy savings.

The intent of this report is to identify, verify, and document the critical parameters for energy savings and establish their compliance with the approved designs set forth in the IGA Report for all of the ECMs involved.

This report is structured such that the core topics and adjoining savings of the project are summarized in sections titled Guarantee Comparison, Savings Summary, and Measurement and Verification Findings. More detailed information about the annual measurement and verification results follow in the Supplemental Information section of the report.

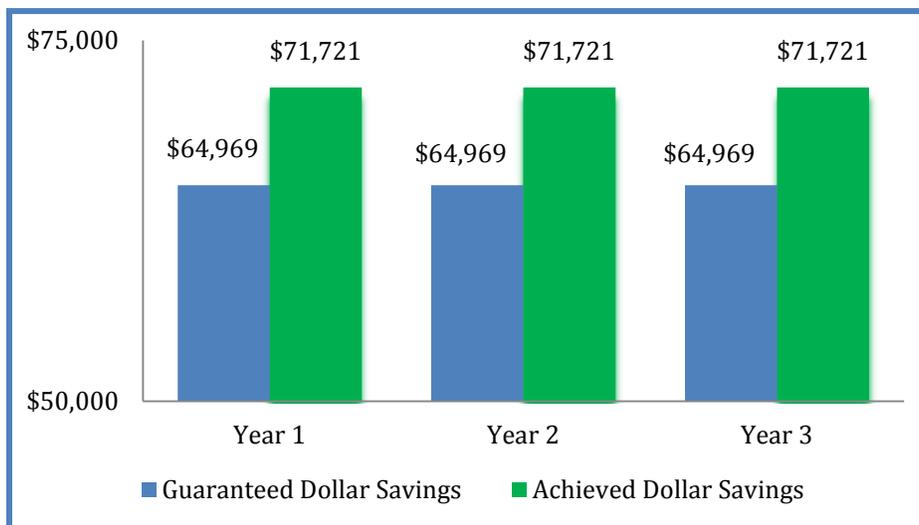


Guarantee Comparison

The purpose of this section is to visualize the comparison between the actual achieved savings amount annually versus the guaranteed annual values, as specified in Schedule D, Exhibit 1 of the Guaranteed Energy Services Agreement (GESA).

Performance Year Three Annual Guaranteed vs. Achieved Savings

Current Year	Guaranteed	Actual	Actual / Guaranteed
Year Three	\$64,969	\$71,721	110%





Savings Summary

Below are the savings summarized for the third year of the performance period that represent the total energy unit and dollar savings generated for each ECM.

Performance Year Three Annual Achieved Savings

Energy Conservation Measure	Electric Energy (kWh)	Fuel Savings (MCF)	Water Savings (kGal)	Utility Cost Savings (\$)
ECM 1.0 – Belmont: Lighting Upgrade/Occupancy Sensors	324,924	0	0	\$28,681
ECM 2.0 – Belmont: Water Conservation	0	9	264	\$2,882
ECM 3.0 – Belmont: Boiler Replacement	0	757	0	\$10,065
ECM 4.0 – Belmont: ED Pack Replacement	21,663	0	0	\$1,912
ECM 5.0 – Belmont: Air Compressor Retro-Commission	22,711	0	0	\$2,005
ECM 6.0 – Belmont: Fridge/Freezer Air Cooled Condenser Conversion	717	0	202	\$2,177
ECM 7.0 – Belmont: DHW System Replacement	0	40	0	\$532
ECM 8.0 – Harrison: Lighting Upgrade/Occupancy Sensors	93,663	0	0	\$7,832
ECM 9.0 – Harrison: Air Compressor Retro-Commission	17,137	0	0	\$1,433
Total	480,815	806	466	\$57,518
			O&M Savings	\$14,203
			Project Total	\$71,721



Measurement and Verification Findings

The following information provides the measurement and verification findings for the current measurement year, along with any CNE recommendations for capturing the greatest savings potential for each ECM implemented at the Belmont-Harrison Career Centers.

ECM 1.0: Belmont: Lighting Upgrade/Occupancy Sensors

Annual Measurement and Verification Plan

Savings for this ECM are based upon IPMVP Volume I, EVO 10000-1:2012, Option "A" (Retrofit Isolation: Key Parameter Measurement) where the retrofitted fixture circuits are isolated, wattages are measured, and the operating hours are estimated.

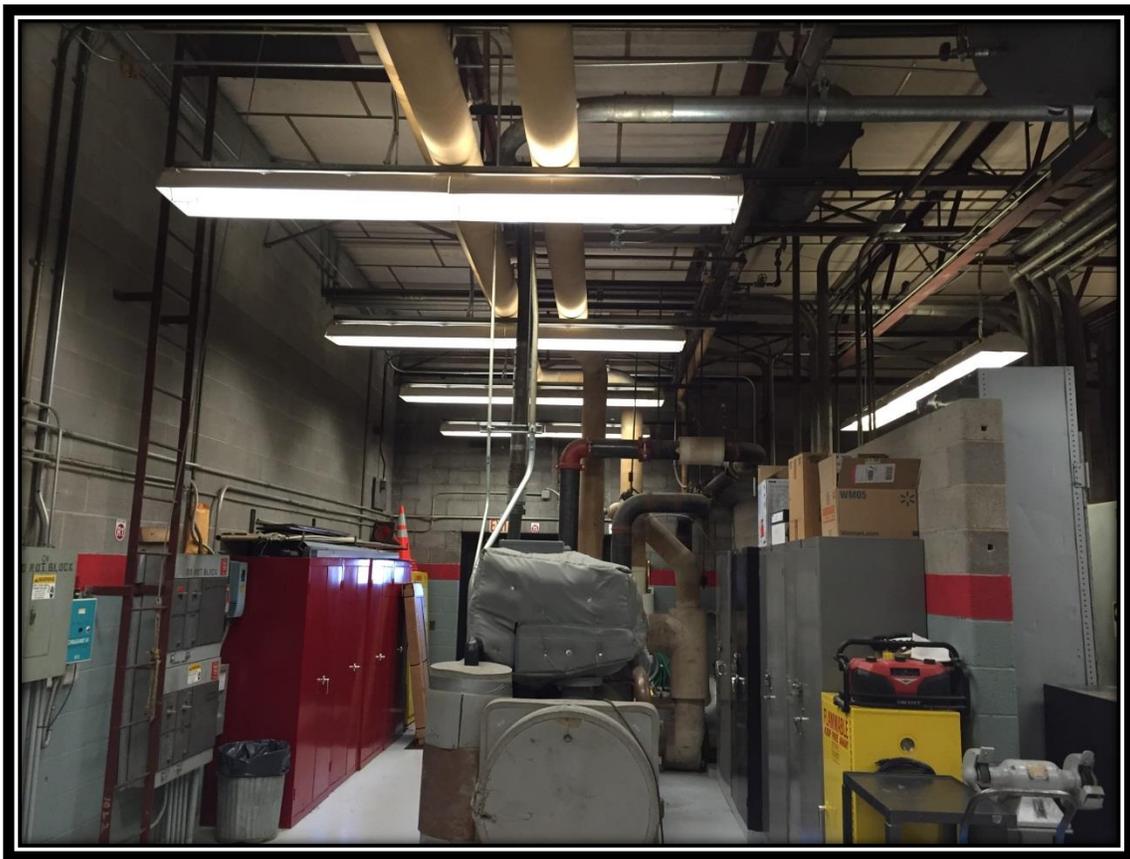
Savings from this ECM are directly related to the lighting retrofit and therefore the measurement boundary is drawn around the retrofitted fixtures and their corresponding circuits. A statistically determined sample size of the representative fixture wattages was measured during the baseline and the post installation periods. Upon completion of the measurements in the baseline and post installation phases, the measurements were utilized to recalculate the actual energy savings. These energy savings are confirmed annually by visiting the ECM and its components, to verify the fixtures remain in place and are being replaced with the equal or less wattage-consuming lamp/ballast combinations as needed.

Refer to the Post Installation Measurement and Verification report, published October 6, 2014, for equations and supporting data utilized to calculate the achieved savings for the measurement year.

Annual Findings

On October 3, 2017, a representative from Constellation NewEnergy, Inc. (CNE) inspected the lighting upgrades to ensure proper operation. Upon inspection it was determined that the interior lighting and light sensors remained installed and were operating as intended.

Additionally, the maintenance staff verified that Belmont-Harrison has sufficient inventory in the event of a lamp or ballast failure of the interior lighting.



Upgraded Lighting Fixtures Installed in Mechanical Room 123B at BCC



Upgraded Lighting Fixtures Shown in Hallway of BCC



Lamp Verification in Carpentry Shop near Water Closet

Early in the year 2017, facilities staff noticed issues with a couple of the motion sensors installed. Ultimately, four of the sensors needed replacing. CNE and BHVSD facilities manager both reached out to the manufacturer. Leviton replaced four failed sensors under warranty.



Installed Leviton Occupancy Sensor

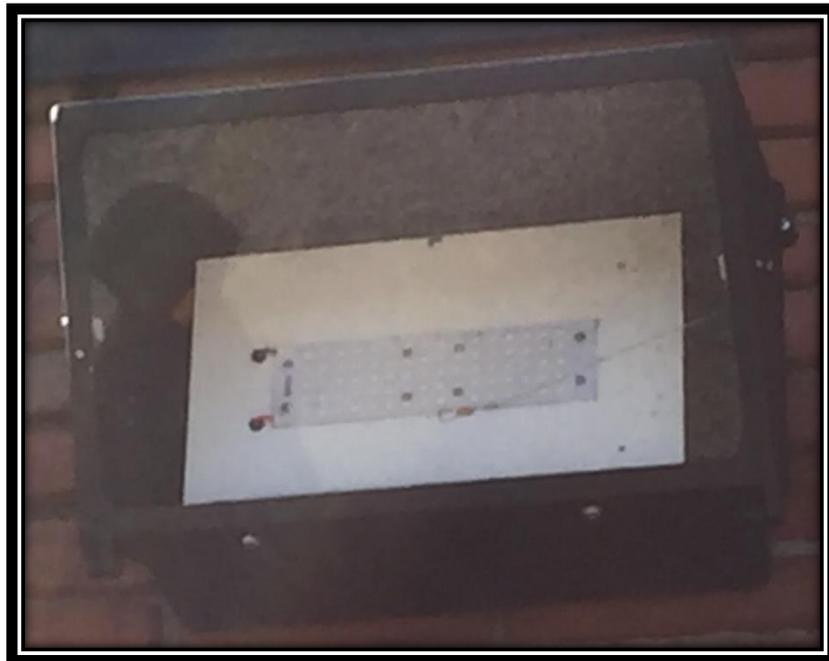
One issue that the customer is facing currently is with some of the upgraded exterior lighting. School representatives expressed a struggle in finding exact replacements for the exterior wall pack fixtures that were installed under this ECM, should a failure occur. One failure occurred outside the Automotive Technology shop, and facilities expressed that they were forced to purchase an LED fixture, remove the electrical components from the new fixture, and implement into the existing housing attached to the exterior wall for the best match aesthetically.



Exterior Wall Pack Upgraded Lighting



Ultra Induction Wall Pack with Sylvania Icteron 100-Watt Lamp and Ballast System



Custom Built LED Fixture by BHVSD due to Failure of 100-Watt Induction Lamp



CNE is working with the customer on attaining correct wall pack fixtures to avoid a scenario like this in the future. The wall pack fixtures should still be covered under Sylvania’s Quick 60 warranty program. This warranty is in effect for the first 60 months after installation.

With equipment remaining installed and operating as intended for ECM #1, the savings for the measurement year may be captured. The associated savings are summarized within the table below. In conjunction with utility savings, the project generates additional operations and maintenance savings in the amount of \$14,203, as specified within the IGA and GESC.

Year Three Annual Achieved Savings				
ECM 1	Electric Energy (kWh)	Fuel (MCF)	Water & Sewer (kgal)	Utility Cost Savings
Lighting Upgrade/ Occupancy Sensors BCC	324,924	0	0	\$28,681



ECM 2.0: Belmont: Water Conservation

Annual Measurement and Verification Plan

The proposed M&V approach is based on IPMVP Volume I, EVO 10000-1:2012, Option "A" (Retrofit Isolation: Key Parameter Measurement) where the retrofitted water fixtures are isolated, flow rate is measured, and the usage/demographics are estimated. Savings from this ECM are directly related to the water conservation ECM, and therefore the measurement boundary is drawn around the water fixtures. A statistically determined sample size of the representative fixtures were measured during the baseline and the post installation periods. Upon completion of the measurements in the baseline and post installation phases, the measurements were utilized to recalculate the actual energy savings. These measures are visually inspected annually to verify that the Constellation-installed fixtures remain in place or are replaced as needed with fixtures that have equivalent or more efficient flowrate.

Refer to the Post Installation Measurement and Verification report submitted October 6, 2014 for equations and supporting data utilized to calculate the achieved savings for the measurement year, as detailed in the Savings Summary section of this report.

Annual Findings

On October 3, 2017, a representative from CNE inspected the water fixture upgrades implemented at Belmont Career Center. These water fixtures remain installed and operating as intended. The maintenance staff verified that there were no current issues with the water fixtures within past performance period.

Flush valves on toilet and urinals, along with the faucet aerators for the sinks, all remain installed in locations spot-checked throughout the Belmont Career Center.



Toilet and Urinal Upgraded Flush Valves Remaining Installed



1.0 GPF Urinal Flush Valve in Men's Faculty Restroom



1.6 GPF Toilet and Flush Valve in Men's Faculty Restroom

With equipment remaining installed and operating as intended for ECM #2, the savings for the measurement year may be captured. The associated savings are summarized within the table below.

ECM 2	Year Three Annual Achieved Savings			
	Electric Energy (kWh)	Fuel (MCF)	Water & Sewer (kgal)	Utility Cost Savings
Water Conservation BCC	0	9	264	\$2,882



ECM 3.0: Belmont: Boiler Replacement

Annual Measurement and Verification Plan

The proposed M&V approach is based on IPMVP Volume I, EVO 10000-1:2012, Option "A" (Retrofit Isolation: Key Parameter Measurement) where the retrofitted boiler(s) are isolated, combustion efficiency is measured, and the heating load is estimated. Savings from this ECM are directly related to the boiler retrofit and therefore the measurement boundary is drawn around the retrofitted boiler.

The baseline combustion efficiency of the existing boilers was measured before removal of pre-existing boilers during normal operating conditions. After completion of the retrofit, combustion efficiency tests were performed on the installed boilers during the post installation period under similar operating conditions that were in effect during the baseline measurement.

The baseline fuel consumption was estimated based on the building heating load. The value was mutually agreed upon by the Belmont-Harrison Vocational School District and CNE to be utilized within the savings calculations during the post-installation phase.

Refer to the Post Installation Measurement and Verification report, published on October 6, 2014, for equations and supporting data utilized to calculate the achieved savings for the current measurement year as detailed in the Savings Summary section of this report.

Annual Findings

On October 3, 2017, a representative from CNE inspected the installed boilers to confirm that they remain in place. The maintenance staff verified that there were no operational issues with the boilers for the 2016-2017 heating season.



Upgraded Boilers Installed for ECM#3 at Belmont Career Center

All boilers are inspected annually by certified technicians. Boilers #1 through #4, including the domestic water boiler, were inspected and approved by licensed professionals on November 28, 2016. Attached to each boiler is a signed approval tag once the boiler passes inspection.

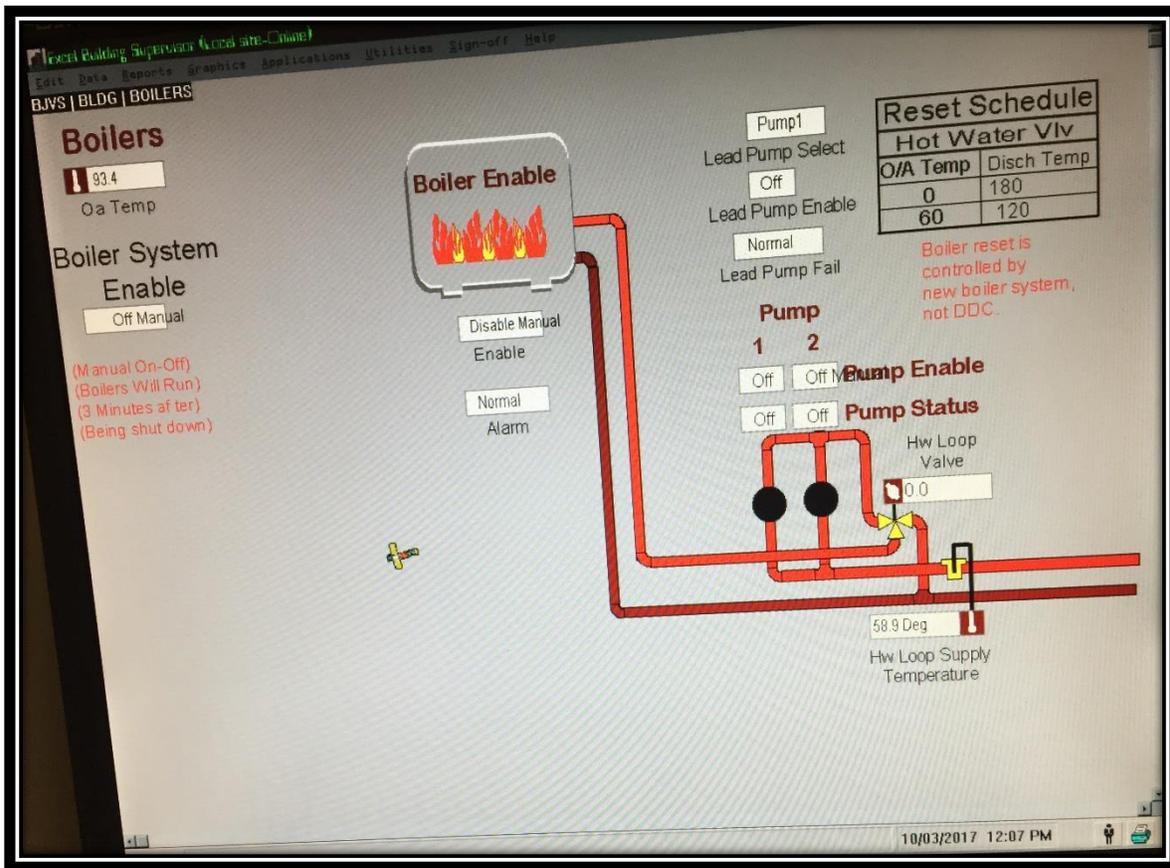


Boiler #3 with Certificate of Inspection

BHVSD has a maintenance contract with H.E. Neumann, the installing contractor for the three (3) new Mod Con 850 commercial boilers. H.E. Neumann also is responsible for the annual preventative maintenance of the boilers. Inspection is within the annual preventative maintenance procedures, which when certified is posted on each boiler.

The average combustion efficiency of the new boilers measured 94.7% during the post installation phase. The new boilers have proven to be a significant upgrade from the pre-existing boiler combustion efficiency of 80%. This data was included within the post installation measurement and verification report and utilized to update the savings for the performance period.

Although the summer/winter mode switch still requires manual valve positioning, the old Honeywell system provides minor insight to the operation of the system, including but not limited to system enable, setpoints, loop temperatures and outside air temperature.



Simple Honeywell Controls Tied to Hot Water Heating System

With the confirmation of continued proper operation of the installed boilers, this ECM captures the corresponding savings for the annual measurement period. The savings associated with this ECM are summarized within the table below.



Year Three Annual Achieved Savings				
ECM 3	Electric Energy (kWh)	Fuel (MCF)	Water & Sewer (kgal)	Utility Cost Savings
Boiler Replacement BCC	0	757	0	\$10,065



ECM 4.0: Belmont: ED Pack Replacement

Annual Measurement and Verification Plan

There is no measurement and verification plan associated with this ECM as detailed in the GESC. Savings are calculated based on engineering calculations and assumptions. The energy savings model was updated with as-built nameplate information where appropriate to determine the annual energy savings. The energy savings model yielded 21,633 kWh in annual energy savings. These savings will be mutually agreed upon throughout the duration of the performance period and shall remain constant as long as the installed equipment is properly maintained and/or operated.

Refer to the Post Installation Measurement and Verification report submitted to Belmont-Harrison on October 6, 2014 for equations and supporting data utilized to calculate the achieved savings for the measurement year, as detailed in the Savings Summary section of this report.

Annual Findings

Annual savings associated with this ECM are summarized within the following table.

ECM 4	Year Three Annual Achieved Savings			
	Electric Energy (kWh)	Fuel (MCF)	Water & Sewer (kgal)	Utility Cost Savings
ED Pack Replacement	21,663	0	0	\$1,912



ECM 5.0: Belmont: Air Compressor Retro-Commission

Annual Measurement and Verification Plan

There is no measurement and verification plan associated with this ECM as detailed in the GESC. Savings are calculated based on engineering calculations and assumptions. The energy savings model was updated with as-built nameplate information where appropriate to determine the annual energy savings. The energy savings model yielded 22,711 kWh in annual electric savings. These savings will be mutually agreed upon throughout the duration of the performance period and shall remain constant as long as the installed equipment is properly maintained and/or operated.

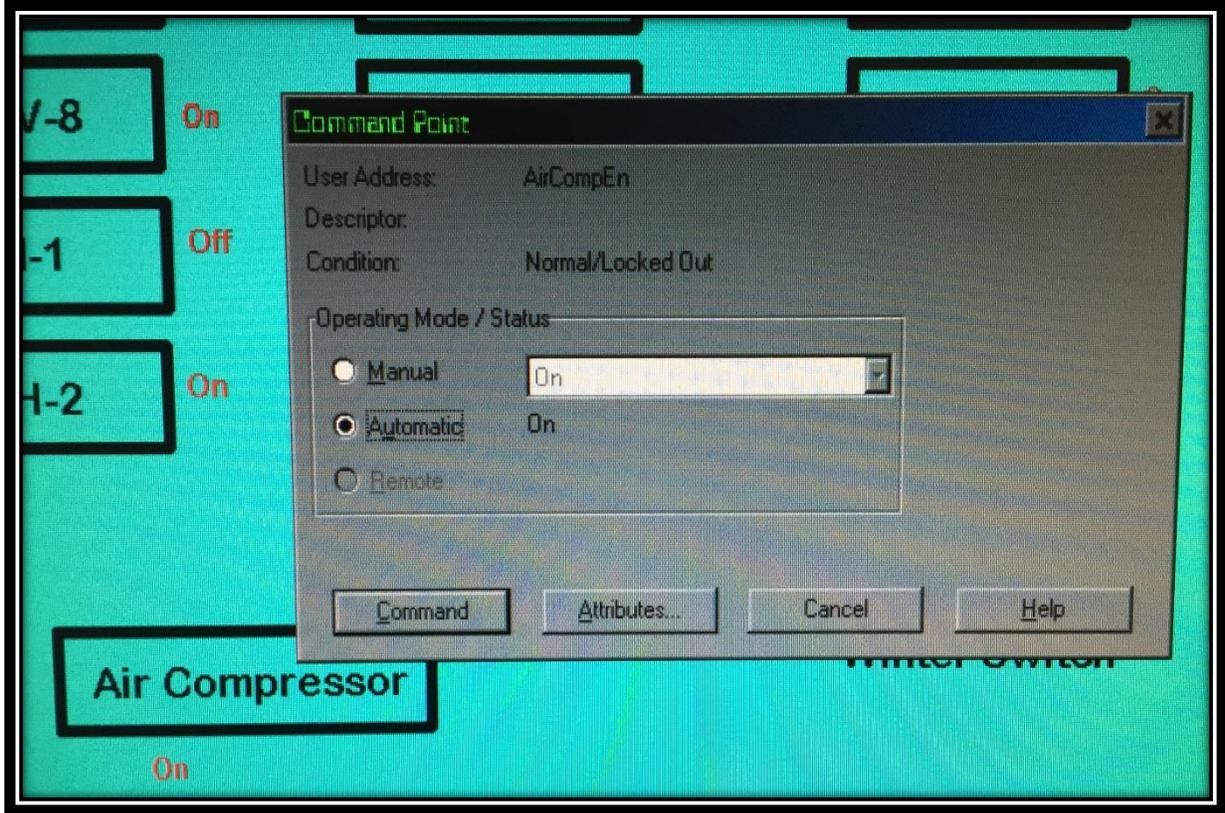
Refer to the Post Installation Measurement and Verification report published on October 6, 2014 for equations and supporting data utilized to calculate the achieved savings for the measurement year, as detailed in the Savings Summary section of this report.

Annual Findings



Air Compressor at BCC

Multiple components of the air systems were updated. One was integrating the units into the existing Honeywell management system.



Air Compressor Control within Existing Honeywell Management System

Annual savings associated with this ECM are summarized within the following table.

ECM 5	Year Three Annual Achieved Savings			
	Electric Energy (kWh)	Fuel (MCF)	Water & Sewer (kgal)	Utility Cost Savings
Air Compressor Retro-Commission BCC	22,711	0	0	\$2,005



ECM 6.0: Belmont: Fridge/Freezer Air-Cooled Condenser Conversion

Annual Measurement and Verification Plan

There is no measurement and verification plan associated with this ECM as detailed in the GESC. Savings are calculated based on engineering calculations and assumptions. The energy savings model was updated with as-built nameplate information where appropriate to determine the annual energy savings. The updated energy savings model yielded 717 kWh in annual electric savings and 202 kgal in annual water savings. These savings will be mutually agreed upon throughout the duration of the performance period and shall remain constant as long as the installed equipment is properly maintained and/or operated.

Refer to the Post Installation Measurement and Verification report dated October 6, 2014 for equations and supporting data utilized to calculate the achieved savings for the measurement year.

Annual Findings

Annual savings associated with this ECM are summarized within the following table.

ECM 6	Year Three Annual Achieved Savings			
	Electric Energy (kWh)	Fuel (MCF)	Water & Sewer (kgal)	Utility Cost Savings
Fridge/Freezer Air-Cooled Condenser Conversion	717	0	202	\$2,177



ECM 7.0: Belmont: DHW System Replacement

Annual Measurement and Verification Plan

There is no measurement and verification plan associated with this ECM as detailed in the GESC. Savings are calculated based on engineering calculations and assumptions. The energy savings model was updated with as-built nameplate information where appropriate to determine the annual energy savings. The updated energy savings model yielded 40 MCF in annual natural gas savings. These savings will be mutually agreed upon throughout the duration of the performance period and shall remain constant as long as the installed equipment is properly maintained and/or operated.

Refer to the Post Installation Measurement and Verification report for equations and supporting data utilized to calculate the achieved savings for the measurement year, as detailed in the Savings Summary section of this report.

Annual Findings

The new domestic hot water system remains installed at Belmont Career Center and operating flawlessly. During the site visit on October 3, 2017, it was visually inspected and the operational characteristics were discussed with maintenance personnel. The following snapshots were taken during the inspection.



BCC Upgraded Domestic Hot Water System

The savings captured for the measurement year associated with this ECM are summarized within the following table.

ECM 7	Year Three Annual Achieved Savings			
	Electric Energy (kWh)	Fuel (MCF)	Water & Sewer (kgal)	Utility Cost Savings
DHW System Replacement	0	40	0	\$532



ECM 8.0: Harrison: Lighting Upgrade/Occupancy Sensors

Annual Measurement and Verification Plan

Savings for this ECM are based upon IPMVP Volume I, EVO 10000-1:2012, Option "A" (Retrofit Isolation: Key Parameter Measurement) where the retrofitted fixture circuits are isolated, wattages are measured, and the operating hours are estimated.

Savings from this ECM are directly related to the lighting retrofit and therefore the measurement boundary is drawn around the retrofitted fixtures and their corresponding circuits. A statistically determined sample size of the representative fixture wattages was measured during the baseline and the post installation periods. Upon completion of the measurements in the baseline and post installation phases, the measurements are utilized to recalculate the actual energy savings. These energy savings are confirmed annually by visiting the ECM and its components, to verify the fixtures remain in place and are being replaced with the equal or less wattage-consuming lamp/ballast combinations as needed.

Refer to the Post Installation Measurement and Verification report, published October 6, 2014, for equations and supporting data utilized to calculate the achieved savings for the measurement year.

Annual Findings

On October 3, 2017, a representative from CNE inspected the lighting upgrades at the Harrison Career Center to ensure proper operation. Upon inspection it was determined that the interior lighting and light sensors remained installed and were operating as intended.

Additionally, the maintenance staff verified that the Belmont-Harrison facilities have sufficient inventory in the event of a lamp or ballast failure. The Career Centers rarely experience failures with the equipment installed under this ECM.

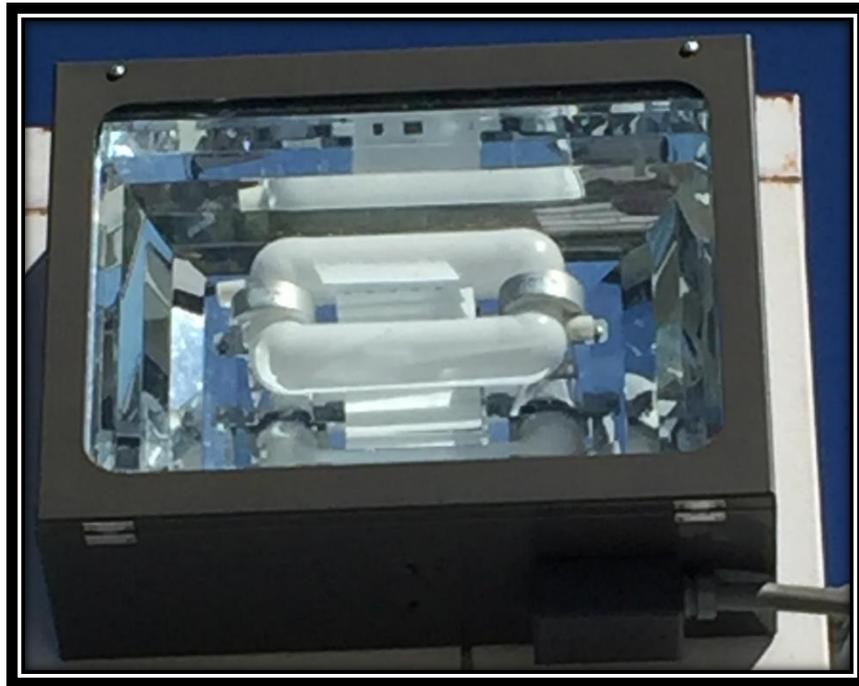


HCC Maintenance Room Upgraded Lighting



HCC Interior Lamp Failure

HCC has experienced and couple failures of lamps. It was described that the lamp type, as shown in the previous snapshots, have proven problematic at a few locations. Aside from the usual burnout, the ECM continues to operate as intended.



Exterior Lighting Upgrade Example

With equipment remaining installed and operating as intended for this ECM, the savings for the measurement year may be captured. The associated savings are summarized within the table below.

ECM 8	Year Three Annual Achieved Savings			
	Electric Energy (kWh)	Fuel (MCF)	Water & Sewer (kgal)	Utility Cost Savings
Lighting Upgrade/ Occupancy Sensors HCC	93,663	0	0	\$7,832



ECM 9.0: Harrison: Air Compressor Retro-Commission

Annual Measurement and Verification Plan

There is no measurement and verification plan associated with this ECM as detailed in the GESC. Savings are calculated based upon engineering calculations and assumptions. The energy savings model was updated with as-built nameplate information where appropriate to determine the annual energy savings. The updated energy savings model yielded 17,137 kWh in annual electric savings. These savings are mutually agreed upon throughout the duration of the performance period and shall remain constant if the installed equipment is properly maintained and operated.

Refer to the Post Installation Measurement and Verification report for equations and supporting data utilized to calculate the achieved savings for the measurement year.

Annual Findings

The annual savings associated with this ECM are summarized within the following table.

ECM 9	Year Three Annual Achieved Savings			
	Electric Energy (kWh)	Fuel (MCF)	Water & Sewer (kgal)	Utility Cost Savings
Air Compressor Retro-Commission HCC	17,137	0	0	\$1,433



Conclusion

The cover letter of this report designates the total captured savings throughout measurement year three for the Belmont-Harrison Vocational School District, which exceed the guaranteed savings amount by \$6,752. Maintenance crews at the Belmont-Harrison Vocational School District continue to adequately address any issues regarding installed equipment through this project as they arise. As long as this effort remains, the district shall realize the guaranteed savings annually.

The lighting upgrade energy conservation measure installed at the Belmont Career Center, as well as the Harrison Career Center, delivers the majority of the energy savings. Combined, the lighting measures account for 64% of the overall savings for the project, before consideration of operation and maintenance savings. The boiler replacement ECM implemented at the Belmont Career Center accounts for another 18% of the overall project savings. With the combination of the two ECMs, this equates to 82% of the overall project savings.

The lighting is inspected daily and the boilers receive at least annual inspections, conducted by a third party professional. Belmont-Harrison has performed phenomenally in regards to continuing preventative maintenance for the implemented ECMs thus far, which produces the greatest savings in return.

The standard State of Ohio Annual Savings Report follows. Third annual performance period metered data was attained from the Belmont-Harrison Vocational School District, analyzed, and results summarized within the corresponding updated utility table. Supporting data is included with the report.



Appendix A:

State of Ohio Standard Forms and Documents

Annual Savings Report

State of Ohio Standard Forms and Documents

Project Name Belmont-Harrison Career Centers Date 10/09/2017
 Project Number 1293

Project Summary	
School District Name	Belmont-Harrison Career Centers
State Project Number (SN)	1293
School Building Name(s)	Belmont Career and Technical Center Harrison Career and Technical Center
Total Project Cost (\$)	\$726,606
Length of Contract Term (years)	15
Projected Avg. Annual Savings (\$)	\$64,969
Construction Started/Completed	Start Date: 2/18/2013 Completion Date: 10/22/2013
Reporting Year (1, 2 or 3)	3
ESCO Name	Constellation NewEnergy, Inc.
ESCO Address	100 Constellation Way, Suite 1000C Baltimore, MD 21202
ESCO Phone Number	(412) 489-9434
ESCO Contact Person	Adam Campbell
ESCO E-mail Address	Adam.Campbell@constellation.com

At a minimum, the following items must be included in the annual report in order to support the summary table above. Additional information may be included and the items below are in no particular order within your report. Please check that the following are included in the report:

- Baseline utility tables (gas, electric, water/sewage, etc.) including rates
- Actual monthly utility data for the current year
- List of adjustments from baseline to current year and the supporting documentation
- Adjusted utility tables for the current reporting year
- Conclusion as to whether the project has met its savings projection
- Conclusion as to whether the project has met its guarantee (for projects approved after September 2013)
- In case of shortfall, what measures are proposed to remedy the shortfall (if applicable)

Prepared by: Adam Campbell

Adam Campbell, PAE
Constellation NewEnergy, Inc.

10-11-2017
Date

Certified by: Mark A Lucas

Mark Lucas, Treasurer
Belmont-Harrison Vocational School District

10/26/17
Date

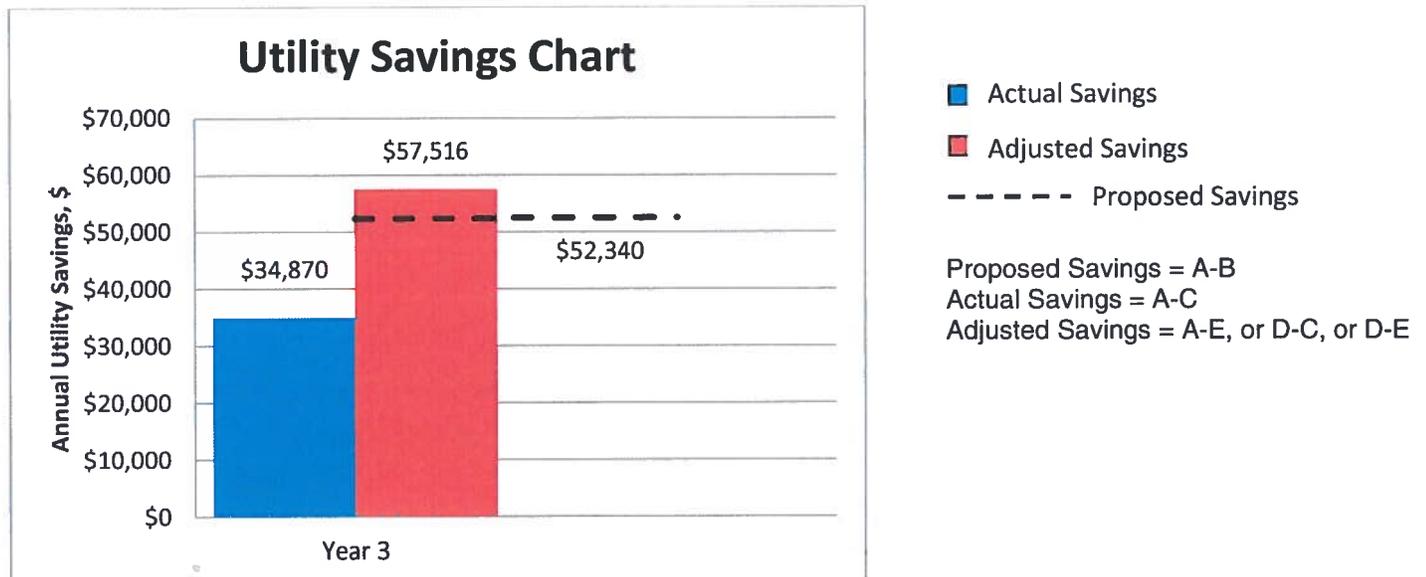
Annual Savings Report

Utility Table

Electricity	Baseline	Proposed	Actual	Adjusted Baseline year	Adjusted Current year
Annual Usage, kWh	1,239,909	803,448	1,083,157	N/A	758,494
Annual Cost, \$	\$107,574	\$69,579	\$93,992	\$N/A	\$65,645
CDD	564		1222	N/A	N/A
Fuel (if applicable)	Baseline	Proposed	Actual	Adjusted Baseline year	Adjusted Current year
Annual Usage, _____ Units	4,360	3,638	3,087	N/A	3,554
Annual Cost, \$	\$57,967	\$48,368	\$41,043	\$N/A	\$47,254
HDD	5,533		4,789	N/A	N/A
Water/Sewage (if applicable)	Baseline	Proposed	Actual	Adjusted Baseline year	Adjusted Current year
Annual Usage _____ Units	936	482	519	N/A	470
Annual Cost, \$	\$9,793	\$5,047	\$5,430	\$N/A	\$4,920
Total Annual Utility Cost, \$	\$175,335(A)	\$122,994(B)	\$140,465(C)	\$N/A(D)	\$117,819(E)

Note: Adjustments can be to baseline year or current (measured) year, or both if baselines are adjusted to a historical average. Adjustments include weather, occupancy, utility rate, over-rides, additions, etc. Please justify these adjustments in the body of the report.

Utility Savings Chart



Belmont Utility Data Comparison
Baseline vs Third Performance Year

Baseline Belmont Utility Usage													
Month	075-530-300-1-1 Metered Usage kWh	075-530-300-1-1 Total Cost	074-696-725-1-8 Metered Usage kWh	074-696-725-1-8 Total Cost	070-764-078-0-3 Metered Usage kWh	070-764-078-0-3 Total Cost	078-164-078-0-8 Metered Usage kWh	078-164-078-0-8 Total Cost	11125841-001 Metered Usage MCF	11125841-001 Total Cost	501-02001-00 Metered Usage kgal	501-02001-00 Total Cost	Grand Total Cost
Mar-11	89,000	\$7,856	25	\$2	127	\$11	396	\$35	689	\$9,159	47	\$492	\$17,556
Apr-11	68,000	\$6,003	24	\$2	150	\$13	336	\$30	374	\$4,970	65	\$680	\$11,698
May-11	62,000	\$5,473	24	\$2	165	\$15	300	\$26	49	\$646	78	\$816	\$6,978
Jun-11	53,000	\$4,678	1	\$0	86	\$8	270	\$24	28	\$374	37	\$387	\$5,471
Jul-11	47,000	\$4,149	0	\$0	88	\$8	288	\$25	26	\$342	137	\$1,433	\$5,957
Aug-11	54,000	\$4,767	1	\$0	102	\$9	327	\$29	26	\$342	47	\$492	\$5,638
Sep-11	88,000	\$7,768	25	\$2	109	\$10	360	\$32	44	\$590	104	\$1,088	\$9,490
Oct-11	66,000	\$5,826	27	\$2	124	\$11	420	\$37	120	\$1,590	115	\$1,203	\$8,670
Nov-11	75,000	\$6,621	23	\$2	161	\$14	444	\$39	493	\$6,556	71	\$743	\$13,975
Dec-11	78,000	\$6,885	17	\$2	217	\$19	480	\$42	776	\$10,323	58	\$607	\$17,878
Jan-12	79,000	\$6,974	26	\$2	156	\$14	471	\$42	913	\$12,135	118	\$1,235	\$20,401
Feb-12	82,000	\$7,238	25	\$2	214	\$19	396	\$35	823	\$10,941	59	\$617	\$18,853
Total	841,000	\$74,238	218	\$19	1,699	\$150	4,488	\$396	4,360	\$57,967	936	\$9,793	\$142,564

Baseline Contract Energy Rates			
Building	Electric Rate (\$/kWh)	Natural Gas Rate (\$/MCF)	Water & Sewer Rate (\$/kgal)
Belmont	\$0.08827	\$13.30	\$10.46

Total Baseline Consumption			
	Electric (kWh)	Natural Gas (MCF)	Water & Sewer (kGal)
Total	847,405	4,360	936
Total, \$	\$74,803	\$57,967	\$9,793

Year 3 Belmont Utility Usage													
Month	075-530-300-1-1 Metered Usage kWh	075-530-300-1-1 Total Cost	074-696-725-1-8 Metered Usage kWh	074-696-725-1-8 Total Cost	070-764-078-0-3 Metered Usage kWh	070-764-078-0-3 Total Cost	078-164-078-0-8 Metered Usage kWh	078-164-078-0-8 Total Cost	11125841-001 Metered Usage MCF	11125841-001 Total Cost	501-02001-00 Metered Usage kgal	501-02001-00 Total Cost	Grand Total Cost
Jul-15	48,000	\$4,237	2	\$0	22	\$2	288	\$25	13	\$173	46	\$481	\$4,919
Aug-15	56,000	\$4,943	2	\$0	21	\$2	327	\$29	14	\$186	53	\$555	\$5,715
Sep-15	70,000	\$6,179	3	\$0	22	\$2	360	\$32	18	\$239	85	\$889	\$7,342
Oct-15	49,000	\$4,325	3	\$0	22	\$2	420	\$37	21	\$279	65	\$680	\$5,324
Nov-15	63,000	\$5,561	3	\$0	52	\$5	444	\$39	101	\$1,343	39	\$408	\$7,356
Dec-15	69,000	\$6,091	2	\$0	396	\$35	480	\$42	615	\$8,177	33	\$345	\$14,690
Jan-16	69,000	\$6,091	2	\$0	790	\$70	471	\$42	793	\$10,543	21	\$220	\$16,965
Feb-16	65,000	\$5,738	3	\$0	714	\$63	396	\$35	614	\$8,163	32	\$335	\$14,334
Mar-16	63,000	\$5,561	3	\$0	416	\$37	396	\$35	536	\$7,126	35	\$366	\$13,126
Apr-16	57,000	\$5,031	3	\$0	29	\$3	336	\$30	320	\$4,255	38	\$398	\$9,716
May-16	55,000	\$4,855	4	\$0	24	\$2	300	\$26	25	\$332	43	\$450	\$5,666
Jun-16	64,000	\$5,649	3	\$0	24	\$2	270	\$24	17	\$226	29	\$303	\$6,205
Total	728,000	\$64,261	33	\$3	2,532	\$223	4,488	\$396	3,087	\$41,043	519	\$5,430	\$111,357

Year 3 Contract Energy Rates			
Building	Electric Rate (\$/kWh)	Natural Gas Rate (\$/MCF)	Water & Sewer Rate (\$/kgal)
Belmont	\$0.08827	\$13.30	\$10.46

Total Year 3 Consumption			
	Electric (kWh)	Natural Gas (MCF)	Water & Sewer (kGal)
Total	735,053	3,087	519
Total, \$	\$64,883	\$41,043	\$5,430

Belmont Proposed Savings				
Utility	Baseline Consump.	Proposed Savings	Proposed Consump.	Total Cost
Electric	847,405	332,315	515,090	\$45,467
NG	4,360	722	3,638	\$48,368
Water	936	454	482	\$5,047

Belmont Adjusted Consumption				
Utility	Baseline Consum.	Achieved Savings	Adjusted Consump.	Total Cost
Electric	847,405	370,015	477,390	\$42,139
NG	4,360	806	3,554	\$47,254
Water	936	466	470	\$4,920

*Note - Adjustments are based upon utilization of IPMVP Option A. The retrofit was isolated and Pre/Post Measurements were completed. See attached report for details

**Harrison Utility Data Comparison
Baseline vs Third Performance Year**

Baseline Harrison Utility Usage					
Month	075-629-996-0-2 Metered Usage kWh	075-629-996-0-2 Total Cost	078-729-996-0-7 Metered Usage kWh	078-729-996-0-7 Total Cost	Grand Total Cost
Mar-11	1,013	\$84.71	46,500	\$3,888.33	\$3,973.04
Apr-11	862	\$72.08	37,500	\$3,135.75	\$3,207.83
May-11	771	\$64.47	25,500	\$2,132.31	\$2,196.78
Jun-11	692	\$57.87	14,700	\$1,229.21	\$1,287.08
Jul-11	735	\$61.46	11,400	\$953.27	\$1,014.73
Aug-11	838	\$70.07	23,400	\$1,956.71	\$2,026.78
Sep-11	922	\$77.10	10,800	\$903.10	\$980.19
Oct-11	1,080	\$90.31	27,600	\$2,307.91	\$2,398.22
Nov-11	1,140	\$95.33	19,200	\$1,605.50	\$1,700.83
Dec-11	1,231	\$102.94	21,900	\$1,831.28	\$1,934.21
Jan-12	1,207	\$100.93	80,700	\$6,748.13	\$6,849.06
Feb-12	1,013	\$84.71	61,200	\$5,117.54	\$5,202.25
Total	11,504	\$961.96	380,400	\$31,809.05	\$32,771.01

Baseline Contract Energy Rates			
Building	Electric Rate (\$/kWh)	Natural Gas Rate (\$/MCF)	Water & Sewer Rate (\$/kgal)
Harrison	\$0.08362	N/A	N/A

Total Baseline Consumption	
Electric (kWh)	
Total	391,904
Total, \$	\$32,771.01

Year 3 Harrison Utility Usage					
Month	075-629-996-0-2 Metered Usage kWh	075-629-996-0-2 Total Cost	078-729-996-0-7 Metered Usage kWh	078-729-996-0-7 Total Cost	Grand Total Cost
Jul-15	735	\$61.46	6,300	\$526.81	\$588.27
Aug-15	838	\$70.07	7,800	\$652.24	\$722.31
Sep-15	922	\$77.10	18,600	\$1,555.33	\$1,632.43
Oct-15	1,080	\$90.31	18,000	\$1,505.16	\$1,595.47
Nov-15	1,140	\$95.33	27,000	\$2,257.74	\$2,353.07
Dec-15	1,231	\$102.94	49,800	\$4,164.28	\$4,267.21
Jan-16	1,207	\$100.93	56,400	\$4,716.17	\$4,817.10
Feb-16	1,013	\$84.71	51,300	\$4,289.71	\$4,374.41
Mar-16	1,013	\$84.71	45,000	\$3,762.90	\$3,847.61
Apr-16	862	\$72.08	26,100	\$2,182.48	\$2,254.56
May-16	771	\$64.47	19,200	\$1,605.50	\$1,669.98
Jun-16	692	\$57.87	11,100	\$928.18	\$986.05
Total	11,504	\$961.96	336,600	\$28,146.49	\$29,108.46

**Harrison Utility Data Comparison
Baseline vs Third Performance Year (Continued)**

Year 3 Contract Energy Rates			
Building	Electric Rate (\$/kWh)	Natural Gas Rate (\$/MCF)	Water & Sewer Rate (\$/kgal)
Harrison	\$0.08362	N/A	N/A

Total Year 3 Consumption	
Electric (kWh)	
Total	348,104
Total, \$	\$29,108.46

Harrison Proposed Savings				
Utility	Baseline Consumption	Proposed Savings	Proposed Consumption	Total Cost
Electric	391,904	103,546	288,358	\$24,112

Harrison Adjusted Consumption				
Utility	Baseline Consumption	Achieved Savings	Adjusted Consumption	Total Cost
Electric	391,904	110,800	281,104	\$23,506

*Note - Adjustments are based upon utilization of IPMVP Option A.
The retrofit was isolated and Pre/Post Measurements were completed.
See attached report for details