

Investment Grade Audit Report

A Guaranteed Energy Savings Project Serving:

The PA Department of Conservation & Natural Resources (DCNR) – State Parks & Forests Central Region, PA

Project No. GESA 2018-2
Contract No. GESA 2018-2.1

Commonwealth of Pennsylvania
Department of General Services
Harrisburg, PA

March 20, 2020

Submitted by:



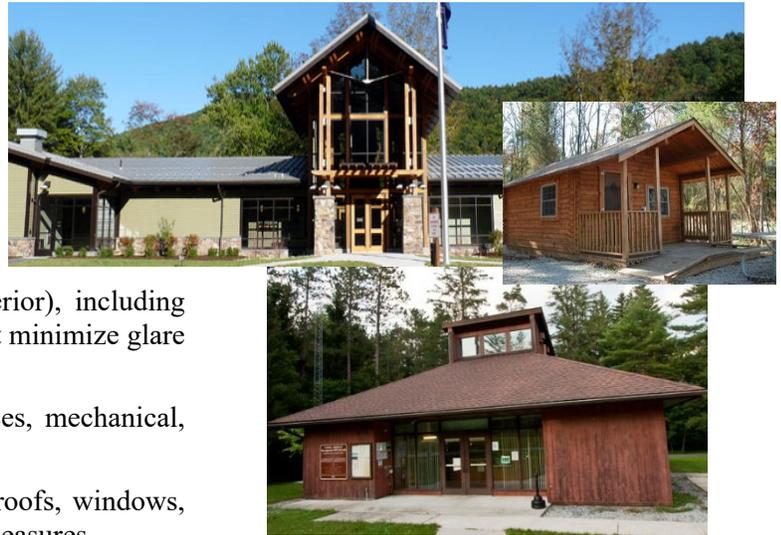
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Table of Contents

1. EXECUTIVE SUMMARY	1
2. PROJECT FINANCIALS	3
3. SCOPE OF WORK	27
4. MEASUREMENT & VERIFICATION	56
5. COMMISSIONING, PREVENTIVE MAINTENANCE & TRAINING	70
6. APPENDICES	74
A. LIGHTING LINE-BY-LINE DATA	
B. ENERGY SAVING CALCULATIONS	
C. EQUIPMENT SPECIFICATION / CUT-SHEETS	

1. Executive Summary

McClure Company is pleased to submit this Investment Grade Audit (IGA) report for providing a Pennsylvania legislated, Guaranteed Energy Savings Act (“GESAs”) solution serving the Pennsylvania Department of Conservation & Natural Resources (DCNR) and the State Parks & Forests comprising the DCNR Central Region. This GESAs program will make energy efficient upgrades and other targeted capital improvements to over 1,500 DCNR facilities distributed throughout the Commonwealth amongst 64 different State Parks and 16 Forest Districts, totaling over 2,138,222 square feet of space. Key improvements addressed for DCNR under this GESAs program include:



- LED lighting system upgrades (interior & exterior), including IDA approved “Dark Sky” lighting strategies that minimize glare while reducing light trespass and skyglow
- Upgrading HVAC and associated boilers/furnaces, mechanical, electrical and plumbing (MEP) systems
- Building envelope improvements, such as new roofs, windows, garage door, and other air infiltration reduction measures
- Domestic Hot Water (DHW) upgrades and other Water Conservation Measure improvements
- Enhanced automated control capabilities
- Implementation of a new on-lot sewage system for Mount Pisgah State Park
- Fuel Conversions, and many other customized measures that enhance efficiency, improve comfort, decrease operating costs, reduce carbon emission and provide for more sustainable operations

A complete listing of all proposed Energy Conservation Measures (ECMs) and capital improvements included under this GESAs program are listed within the table to the right. Detailed descriptions, including project costs and savings information, are enclosed in following sections of this report.

The development of this GESAs program was an open, collaborative effort between the McClure Company, DCNR, and PA DGS teams. As part of this effort, McClure’s team of Professional Engineers, Certified Energy Managers, estimators, and Construction Managers conducted multiple on-site surveys of each facility, interviewed DCNR staff, completed detailed analysis of provided utility history data and rate structures, outlined operating status of existing systems & conditions, and performed detailed savings calculations, developmental engineering, and hard cost analysis of the State Parks and Forest Districts comprising the DCNR Central Region. Work-scope development focused on addressing DCNR priorities and site needs, incorporating DCNR “Core Energy Conservation Measures (ECMs)”, defined “Wish-List” items, Park/Forestry staff requested improvements, McClure identified energy savings opportunities, and combination of jointly developed solutions that enhance DCNR operations and reduce operating costs for the long-term.

ECM #	DCNR GESAs Program - Central Region Energy Conservation Measure (ECM) Listing
1	LED Lighting
2	Building Envelope
3	Roofing Upgrades
4	Window Upgrades
5	Garage Door Upgrades
6	Storage Upgrades
7	HVAC System Upgrades
8	DHW System Upgrades
9	Boiler / Furnace Upgrades
10	Controls / Recommissioning
11	Residence HVAC/Boiler/DHW
12	Cabin HVAC
13	Cottage/Yurt Heating
14	Shower House DHW Upgrades
15	Restroom DHW Upgrades
16	Water Conservation
17	Solar Vent Fan
18	Gas Well / Alternative Fuel Source
19	Underground Utility Replacement
20	EV Charging Station
21	On Lot Sewage System Upgrades

Cost & Savings Summary

As a result of this Investment Grade Audit, McClure Company has identified and developed twenty-one (21) recommended ECM opportunities and capital improvement projects across multiple sites, which in aggregate will generate over \$500,000 per year in energy costs savings for DCNR Central Region sites. DCNR will also recognize significant annual Operation and Maintenance (O&M) “material” cost savings as a result of implementing the recommended LED lighting and mechanical/HVAC systems improvements. This supports the implementation of a GESA program that addresses more energy related deferred maintenance and capital improvement needs resulting in more cost-effective, sustainable DCNR operations. Collectively, these ECMs provide a comprehensive GESA solution that will produce over 35.99% in utility cost savings from the total annual operational spend of DCNR Central Region State Parks and Forest Districts. Post construction, and over the twenty (20) year GESA term, these ECMs will generate \$23,193,405 in total project related savings.

DCNR Central Region GESA Program Summary	
Repayment Term	18 Years
Total Value of Facility Improvements	\$16,458,615
Year 1 Guaranteed Savings - Energy & Operational Costs Savings	\$612,825
Total Project Related Savings	\$23,193,405

GESA Program Environmental & Economic Impact Summary

Through the implementation of the recommended ECMs and associated DCNR selected energy related cost savings (ERCS) projects comprising this GESA program, DCNR will also realize significant greenhouse gas, environmental, and economic benefits as detailed within the table below. McClure will update and track all environmental & economic benefits generated by this GESA program as the full scope-of-work is implemented.

Environmental Benefits							
Projected Greenhouse Gas (GhG) Emission & Carbon Footprint Reductions							
Annual Avoided Emission Production							
Utility & Unit	Annual Unit Savings	Annual GHG Emission Reductions (Lbs.) 	Cars Not Driven 	Gallons of Gasoline Not Consumed 	Pounds of Coal Not Burned 	Houses Powered 	Acres of Trees Planted 
Electric (kWh)	3,868,938	6,030,732	591	307,808	3,014,139	316	3,572
Natural Gas (CCF)	2,316	27,015	2.6	1,379	13,502	1.4	16
Oil (Gal)	33,609	658,484	63.4	33,609	329,108	34.5	390
Totals (Annual):		6,716,231	657	342,796	3,356,749	351.9	3,978
Total (18 Year):		120,892,158	11,826	6,170,328	60,421,482	6,334	71,604

Local Economic Benefits – Projected New Jobs Created	
New Direct, Indirect, &/or Induced Jobs	270 - 280

McClure Company looks forward to working with DCNR and DGS towards the successful implementation of this very important GESA program that addresses DCNR’s capital improvement needs, plans, and deferred maintenance issues while effectively reducing operational costs, emissions production, and utility demands over the long term.

2. Project Financials

This section includes the financial summaries and tables for the recommended project scope outlined in Section 3 Scope of Work.

Cashflow Analysis

The below table is the representative cash flow for the project, based on 20-year term, 18-year financing at 2.9%, including all applicable operation and maintenance savings as detailed within the scopes of work, and necessary energy related cost savings.

Full Project GESA Model				
Total Project Cost:	\$	16,458,615	Interest Rate:	2.90%
Rebates /Incentives:	\$	-	Annual Utility Escalation Rate:	1%
Net Project Cost to be Financed:	\$	16,458,615	Construction Period (Months):	24
First Year Energy Savings:	\$	513,796	Payment Frequency:	Annual

Year	A Annual Energy Costs without Improvements	B Annual Energy Costs with Improvements	C Annual Energy Cost Savings (A-B)	D O&M (Includes ACT 129)	E Total Savings (C + D)	F Payments for Financing Equipment	G Energy Related Cost Savings	H Payments for Monitoring & Maintenance Services	I Net Annual Benefit	J Cumulative Cash Flow
Const.	\$1,413,646	\$1,159,292	\$254,355	\$0	\$254,355	\$0	\$0	\$0	\$254,355	\$254,355
1	\$1,427,783	\$913,986	\$513,796	\$99,028	\$612,825	\$1,180,152	\$600,000	\$22,000	\$10,672	\$265,027
2	\$1,442,061	\$923,126	\$518,934	\$99,028	\$617,962	\$1,180,152	\$597,500	\$22,660	\$12,650	\$277,677
3	\$1,456,481	\$932,358	\$524,124	\$99,028	\$623,152	\$1,180,152	\$595,000	\$23,340	\$14,660	\$292,336
4	\$1,471,046	\$941,681	\$529,365	\$99,028	\$628,393	\$1,180,152	\$570,000	\$0	\$18,241	\$310,577
5	\$1,485,757	\$951,098	\$534,659	\$99,028	\$633,687	\$1,180,152	\$565,000	\$0	\$18,534	\$329,111
6	\$1,500,614	\$960,609	\$540,005	\$99,028	\$639,033	\$1,180,152	\$560,000	\$0	\$18,881	\$347,992
7	\$1,515,620	\$970,215	\$545,405	\$99,028	\$644,433	\$1,180,152	\$555,000	\$0	\$19,281	\$367,273
8	\$1,530,776	\$979,917	\$550,859	\$99,028	\$649,887	\$1,180,152	\$545,000	\$0	\$14,735	\$382,008
9	\$1,546,084	\$989,716	\$556,368	\$99,028	\$655,396	\$1,180,152	\$535,000	\$0	\$10,244	\$392,252
10	\$1,561,545	\$999,614	\$561,932	\$99,028	\$660,960	\$1,180,152	\$525,000	\$0	\$5,807	\$398,059
11	\$1,577,161	\$1,009,610	\$567,551	\$99,028	\$666,579	\$1,180,152	\$520,000	\$0	\$6,427	\$404,485
12	\$1,592,932	\$1,019,706	\$573,226	\$99,028	\$672,254	\$1,180,152	\$515,000	\$0	\$7,102	\$411,588
13	\$1,608,861	\$1,029,903	\$578,959	\$99,028	\$677,987	\$1,180,152	\$505,000	\$0	\$2,834	\$414,422
14	\$1,624,950	\$1,040,202	\$584,748	\$99,028	\$683,776	\$1,180,152	\$500,000	\$0	\$3,624	\$418,046
15	\$1,641,200	\$1,050,604	\$590,596	\$99,028	\$689,624	\$1,180,152	\$497,000	\$0	\$6,471	\$424,517
16	\$1,657,612	\$1,061,110	\$596,502	\$99,028	\$695,530	\$1,180,152	\$492,000	\$0	\$7,377	\$431,895
17	\$1,674,188	\$1,071,721	\$602,467	\$99,028	\$701,495	\$1,180,152	\$487,000	\$0	\$8,342	\$440,237
18	\$1,690,930	\$1,082,438	\$608,491	\$99,028	\$707,519	\$1,180,152	\$481,703	\$0	\$9,070	\$449,307
19	\$1,707,839	\$1,093,263	\$614,576	\$99,028	\$713,604	\$0	\$0	\$0	\$713,604	\$1,162,911
20	\$1,724,917	\$1,104,195	\$620,722	\$99,028	\$719,750	\$0	\$0	\$0	\$719,750	\$1,882,661
Totals:	\$32,852,003	\$21,284,363	\$11,567,640	\$1,980,562	\$13,548,202	\$21,242,743	\$9,645,203	\$68,000	\$1,882,661	

NPV of Cashflow (Column I):

For the above table, construction or Year (0) savings are the result of phased implementation of ECM's during the construction period prior to the commencement of the saving guarantee, and are a portion of the total expected, guaranteed Year 1 savings. Included O&M savings are derived from material and repair costs based on equipment type and use and does not include any cost savings for DCNR labor. The interest rate was provided by PA DGS based on financing of similar projects at the time of this report. The escalation rate for energy costs and O&M savings have been dictated by PA DGS at 1% and 0% respectively. At this time, there are no expected ACT 129 savings associated with the scope of work, as many of the sites are within Rural Electric Cooperatives or Associations (REC/REAs) which are not required to offer utility sponsored rebates. However, should rebates be available, McClure will review and apply as necessary on DCNR's behalf. Any rebates received will be credited towards project contingency. The above cashflow is for informational purposes only, as a final financing package and any customer desired contingency are required.

Project Scope Summary Costs

The below table (Scope Summary Total Costs & Savings by Site) provides selected scope and total costs by site, along with associated project savings by site. Selections within the cells of the table are indicators of scope as shown below. The costs shown in this Scope Summary Total Cost Savings by Site include all applicable allowances further detailed in the Scope Summary Cost Savings Breakout and scopes of work in Section 3.

	MCCLURE ADDED SCOPE
	SITE REQUESTED SCOPE
	SITE/MCCLURE SCOPE AGREEMENT
	WISHLIST ITEM
	ORIGINAL RFP SCOPE
DF	DUAL FUEL
TBD	PRICE TBD; NOT INCLUDED IN TOTAL COST
FC	FUEL CONVERSION
#	QUANTITY OF SCOPE

Scope Summary – Total Costs & Savings by Site																													
Site	LED Lighting	Building Envelope	Roofing Upgrades	Window Upgrades	Garage Door Upgrades	Storage Upgrades	HVAC System Upgrades	DHW System Upgrades	Boiler/Furnace Upgrades	Controls/Recommissioning	Residence HVAC/Boiler/DHW	Cabin HVAC	Cottage/Yurt Heating	Shower House DHW Upgrades	Restroom DHW Upgrades	Water Conservation	Solar	Solar Vent Fan	Sewage Metering	Gas Well/Alternate Fuel Source	Underground Utility Replacement	EV Charging Station	On Lot Sewage System Upgrades	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Energy Related Cost Savings	Simple Payback
Michaux Forest District #1 RMC	X	X					X		X															\$153,385	\$5,559	\$125,130	\$34,720	\$93,002	10.86
FFP Black Moshannon Tanker	X																							\$1,187	\$153	\$3,444	\$80	\$0	7.76
Buchanan Forest District #2 RMC																						X							
FD 2 Bear Valley	X	X					X																	\$185,430	\$2,991	\$67,366	\$3,140	\$144,599	13.65
FD2 Chaneyville HQ																													
FD2 Sideling Hill HQ	X	X																											
Tuscarora Forest District #3 RMC	X	X		X	X		X																	\$308,317	\$11,188	\$251,873	\$44,405	\$182,624	11.23
FD3 Bryner HQ	X	X																											
FD3 East Licking Creek HQ	X	X																											
Rothrock Forest District #5 RMC	X	X					X				X																		
FD5 Whipple Dam HQ	X	X																											
FD5 Stony Point HQ	X	X																						\$372,874	\$12,596	\$283,590	\$39,560	\$193,512	14.24
FD5 Trough Creek HQ	X	X																											
FD5 Greenwood HQ	X	X																											
Bald Eagle Forest District #7 RMC	X	X			X		X																						
FD7 Eastville HQ	X	X		X	X				FC																				
FD7 Hickernell HQ	X	X		X	X																			\$422,771	\$6,207	\$139,755	\$33,300	\$302,899	19.31
FD7 NLV HQ	X	X																											
FD7 Troxelville HQ	X	X			X																								
Moshannon Forest District #9 RMC	X	X																											
FD9 Black Moshannon HQ	X	X							X															\$236,797	\$11,393	\$256,507	\$18,500	\$91,193	12.78
FD9 Quehanna HQ	X	X																											
FD9 Dague Forest HQ	X	X																											
Sproul Forest District #10 RMC	X	X					X	FC	FC																				
FD10 Cooks Run HQ	X	X							FC		FC													\$288,119	\$8,987	\$202,349	\$43,879	\$172,205	12.90
FD10 Snow Shoe HQ	X	X																											
FD10 Hyner Forest HQ	X	X																											
Tiadaghton Forest District #12 RMC	X	X									X																		
FD12 Jersey Mills HQ	X	X			X																			\$357,672	\$22,701	\$511,117	\$35,903	\$132,990	9.90
FD12 Rauchtown HQ	X	X			X				FC																				
FD12 Waterville HQ	X	X			X						X																		



Scope Summary – Total Costs & Savings by Site																													
Site	LED Lighting	Building Envelope	Roofing Upgrades	Window Upgrades	Garage Door Upgrades	Storage Upgrades	HVAC System Upgrades	DHW System Upgrades	Boiler/Furnace Upgrades	Controls/Recommissioning	Residence HVAC/Boiler/DHW	Cabin HVAC	Cottage/Yurt Heating	Shower House DHW Upgrades	Restroom DHW Upgrades	Water Conservation	Solar	Solar Vent Fan	Sewage Metering	Gas Well/Alternate Fuel Source	Underground Utility Replacement	EV Charging Station	On Lot Sewage System Upgrades	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Energy Related Cost Savings	Simple Payback
Pump House Structure							FC																						
Elk Forest District #13 RMC	X	X																											
FD13 Hick's Run HQ	X																												
FD13 Brooks Run HQ	X	X																											
FD13 Sizerville HQ	X	X																											
Susquehannock Forest District #15 RMC	X	X			X		X	X	X																				
FD15 Cross Forks Forest HQ	X	X			X																								
FD15 Lyman Run Forest HQ	X	X			X																								
FD15 Bark Shanty HQ	X	X			X																								
Tioga Forest District #16 RMC	X	X																											
FD16 Ansonia HQ	X	X																											
FD 16 Armenia HQ	X	X																											
Mira Lloyd Dock RCC Forest District #21 ("Penn Nursery")	X	X				X			X	X																			
Park Region 1 Office (Included with Elk Forest District #13)																													
Bald Eagle State Park	X	X							FC	X			6																
Bendigo State Park	X	X																											
Black Moshannon State Park	X	X					X		X			7	2	1															
Chapman State Park	X	X					X	X	X				5																
Cherry Springs State Park	X																												
Denton Hill State Park	X																												
Elk Country Visitor Center	X	X																											
Hills Creek State Park	X	X									X	10	5	3															
Hyners Run State Park	X	X												1															
Kettle Creek State Park	X	X												1															
Kinzua Bridge State Park	X	X																											
Leonard Harrison State Park	X	X					FC							1															
Little Pine State Park	X	X					FC						5	1															



Scope Summary – Total Costs & Savings by Site																													
Site	LED Lighting	Building Envelope	Roofing Upgrades	Window Upgrades	Garage Door Upgrades	Storage Upgrades	HVAC System Upgrades	DHW System Upgrades	Boiler/Furnace Upgrades	Controls/Recommissioning	Residence HVAC/Boiler/DHW	Cabin HVAC	Cottage/Yurt Heating	Shower House DHW Upgrades	Restroom DHW Upgrades	Water Conservation	Solar	Solar Vent Fan	Sewage Metering	Gas Well/Alternate Fuel Source	Underground Utility Replacement	EV Charging Station	On Lot Sewage System Upgrades	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Energy Related Cost Savings	Simple Payback
Lyman Run State Park	X	X																						\$101,484	\$7,312	\$164,620	\$9,900	\$0	13.88
Mount Pisgah State Park	X	X					FC		FC				1										X	\$1,584,520	\$10,535	\$237,169	\$218,513	\$1,405,063	17.03
Ole Bull State Park	X	X					FC				X	1	2											\$191,830	\$9,540	\$214,773	\$33,360	\$101,985	9.42
Parker Dam State Park	X						X																X	\$609,923	\$5,994	\$134,952	\$95,820	\$516,130	15.65
Poe Paddy State Park	X																							\$6,758	\$251	\$5,653	\$420	\$1,738	20.00
Poe Valley State Park	X	X											4											\$45,823	\$1,042	\$23,465	\$6,200	\$24,983	20.00
Ravensburg State	X												1											\$23,151	\$430	\$9,672	\$2,865	\$17,144	13.97
Raymond B. Winter State Park	X	X											3	1										\$117,638	\$5,065	\$114,017	\$20,420	\$20,804	19.12
Reeds Gap State Park	X	X																						\$98,991	\$5,466	\$123,050	\$5,320	\$28,917	12.82
Shikellamy State Park	X	X																						\$34,991	\$5,765	\$129,783	\$6,318	\$0	6.07
Simon B. Elliott State Park	X	X																						\$9,961	\$1,526	\$34,349	\$5,440	\$0	6.53
Sinnemahoning State Park	X	X					X	X	X		X	1	1	6										\$1,088,087	\$16,516	\$371,859	\$163,180	\$849,553	14.44
Sizerville State Park	X	X									X		1											\$127,360	\$3,558	\$80,119	\$19,900	\$69,001	16.40
Park Region 3 Office	X	X						X																\$106,677	\$7,353	\$165,536	\$9,740	\$19,036	11.92
Big Spring State Forest Picnic Area																													
Blue Knob State Park	X	X										4	2	1										\$179,100	\$6,265	\$141,022	\$52,860	\$71,895	17.11
Boyd Big Tree Preserve Conservation Area	X																							\$2,963	\$373	\$8,390	\$639	\$0	7.94
Caledonia State Park	X	X										1	1											\$219,712	\$9,909	\$223,086	\$19,180	\$56,787	16.44
Canoe Creek State Park	X	X					X		DF			8	1	1										\$532,361	\$17,736	\$399,325	\$51,020	\$317,538	12.11
Codus State Park	X	X					FC		FC		FC		5	5		X								\$683,767	\$23,635	\$532,114	\$72,060	\$334,003	14.80
Colonel Denning State Park	X	X					FC		FC		FC													\$203,204	\$4,649	\$104,643	\$31,522	\$161,583	8.95
Cowan's Gap State Park	X	X																						\$87,803	\$10,088	\$227,104	\$18,520	\$0	8.70
Fowler's Hollow State Park	X	X																						\$2,416	\$260	\$5,862	\$414	\$0	9.29
Gifford Pinchot State Park	X	X		X			X	FC	FC		FC	10	5	8										\$1,265,951	\$26,888	\$605,377	\$132,960	\$913,124	13.12
Greenwood Furnace State Park	X	X						FC	FC		FC		1											\$285,951	\$13,021	\$293,164	\$75,100	\$199,177	6.66
Joseph E. Ibberson Conservation Area	X																							\$1,414	\$69	\$1,556	\$451	\$0	20.49
Kings Gap Environmental Ed. Center	X																							\$71,026	\$6,471	\$145,680	\$23,280	\$8,047	9.73



Scope Summary – Total Costs & Savings by Site																													
Site	LED Lighting	Building Envelope	Roofing Upgrades	Window Upgrades	Garage Door Upgrades	Storage Upgrades	HVAC System Upgrades	DHW System Upgrades	Boiler/Furnace Upgrades	Controls/Recommissioning	Residence HVAC/Boiler/DHW	Cabin HVAC	Cottage/Yurt Heating	Shower House DHW Upgrades	Restroom DHW Upgrades	Water Conservation	Solar	Solar Vent Fan	Sewage Metering	Gas Well/Alternate Fuel Source	Underground Utility Replacement	EV Charging Station	On Lot Sewage System Upgrades	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Energy Related Cost Savings	Simple Payback
Little Buffalo State Park	X	X						FC			FC			1										\$274,209	\$13,795	\$310,586	\$38,830	\$104,278	12.32
Mont Alto State Park																													
Penn-Roosevelt State Park																													
Pine Grove Furnace State Park	X	X					X	FC	FC		FC	1												\$323,450	\$15,939	\$358,846	\$57,340	\$166,832	9.83
Prince Gallitzin State Park	X	X					X		DF			10	5	4							X			\$1,751,264	\$48,738	\$1,097,317	\$99,460	\$1,275,736	9.76
Samuel S. Lewis State Park	X	X	X								FC													\$65,588	\$1,082	\$24,360	\$8,080	\$56,409	8.48
Shawnee State Park	X	X										1	5	2	3									\$302,443	\$22,628	\$509,426	\$59,120	\$82,031	9.74
Susquehannock State Park	X	X																						\$15,923	\$2,085	\$46,932	\$880	\$0	7.64
Trough Creek State Park	X	X						FC	FC			1												\$124,782	\$6,939	\$156,228	\$13,380	\$46,203	11.32
Warriors Path State Park																													
Whipple Dam State Park																													
Sub-total																						\$15,882,776	\$513,796	\$11,567,640	\$1,980,562	\$9,645,203	12.14		
Bond																						\$99,355							
Contingency																						\$476,483							
Total																						\$16,458,615							

The below table provides detailed breakouts of the proposed scope by site and by scope within that site. Bold and italicized values are the totals for the respective site, with breakouts below for scope at the site. Items 6.b.v and 6.c.iv are show as customer allowances. Final cost for these measures will be secured (if included) during preconstruction from an applicable vendor (Residential Windows) and any difference in cost will become additional project contingency. Item 29.e also listed as an allowance. Final cost for this measure will be determined during preconstruction as onsite engineering investigations are required. As with the other allowances, and difference in cost will become additional project contingency.





Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
1) Michaux Forest District #1	\$153,385	\$5,559	\$125,130	\$34,720	\$159,850	\$93,002	\$252,852	10.86
a) RMC								
i) LED Lighting	\$42,163	\$4,648	\$104,602	\$22,720	\$127,322	\$0	\$127,322	9.07
ii) Building Envelope & Air Sealing	\$11,334	\$395	\$8,901	\$0	\$8,901	\$3,434	\$12,335	20.00
iii) HVAC/Boiler System Upgrades	\$99,888	\$516	\$11,627	\$12,000	\$23,627	\$89,568	\$113,195	20.00
2) FFP Black Moshannon Tanker	\$1,187	\$153	\$3,444	\$80	\$3,524	\$0	\$3,524	7.76
a) LED Lighting	\$1,187	\$153	\$3,444	\$80	\$3,524	\$0	\$3,524	7.76
3) Buchanan Forest District #2	\$185,430	\$2,991	\$67,366	\$3,140	\$70,506	\$144,599	\$215,105	13.65
a) RMC								
i) Installation of EV Charging Station	\$85,526	\$0	\$0	\$0	\$0	\$85,526	\$85,526	N/A
b) FD2 Bear Valley								
i) LED Lighting	\$16,618	\$1,304	\$29,367	\$1,240	\$30,607	\$0	\$30,607	12.74
ii) Building Envelope & Air Sealing	\$13,755	\$147	\$3,319	\$0	\$3,319	\$10,815	\$14,134	20.00
iii) HVAC System Upgrades	\$30,396	\$0	\$0	\$0	\$0	\$30,396	\$30,396	N/A
c) FD2 Chaneyville HQ- no scopes								
d) FD2 Sideling Hill HQ								
i) LED Lighting	\$17,853	\$1,369	\$30,827	\$1,900	\$32,727	\$0	\$32,727	13.04
ii) Building Envelope & Air Sealing	\$21,282	\$171	\$3,853	\$0	\$3,853	\$17,862	\$21,715	20.00
iii) Roof Replacement- site provided roof replacement proposal for metal roofing area currently leaking (per Karl Maul in 10/23/19 email remove from scope)								
4) Tuscarora Forest District #3	\$308,317	\$11,188	\$251,873	\$44,405	\$296,278	\$182,624	\$478,902	11.23
a) RMC								
i) LED Lighting (includes Bryner HQ)	\$78,982	\$6,907	\$155,496	\$13,089	\$168,585	\$0	\$168,585	11.44
ii) Building Envelope & Air Sealing	\$4,808	\$854	\$19,225	\$0	\$19,225	\$0	\$19,225	5.63
(1) McClure Recommended Other Envelope Upgrades	\$24,108				\$0	\$24,108	\$24,108	N/A
iii) HVAC System Upgrades	\$133,467	\$772	\$17,373	\$30,000	\$47,373	\$118,027	\$165,400	20.00



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
iv) Window Upgrades	\$27,963	\$103	\$2,327	\$0	\$2,327	\$25,903	\$28,230	20.00
b) FD3 Bryner HQ								
i) LED Lighting (included in RMC)								
ii) Building Envelope & Air Sealing	\$7,419	\$1,066	\$23,995	\$0	\$23,995	\$0	\$23,995	6.96
iii) Controls Upgrades and Recommissioning	\$19,526	\$247	\$5,564	\$0	\$5,564	\$14,586	\$20,150	20.00
c) FD3 East Licking Creek HQ								
i) LED Lighting	\$9,403	\$935	\$21,044	\$1,316	\$22,360	\$0	\$22,360	10.06
ii) Building Envelope & Air Sealing	\$2,641	\$304	\$6,849	\$0	\$6,849	\$0	\$6,849	8.69
5) Rothrock Forest District #5								
\$372,874	\$12,596	\$283,590	\$39,560	\$323,150	\$193,512	\$516,662	14.24	
a) RMC								
i) LED Lighting	\$10,226	\$312	\$7,029	\$1,380	\$8,409	\$3,986	\$12,395	20.00
ii) Building Envelope & Air Sealing	\$31,737	\$2,280	\$51,337	\$0	\$51,337	\$0	\$51,337	13.92
iii) HVAC System and Controls/Recommissioning Upgrades	\$95,837	\$2,941	\$66,209	\$0	\$66,209	\$37,017	\$103,226	20.00
(4) McClure Recommended alternate pricing allowance/contingency for replacement of the heat pumps and energy recovery unit.	\$116,802	\$143	\$3,215	\$30,000	\$33,215	\$113,942	\$147,157	20.00
b) FD5 Whipple Dam HQ								
i) LED Lighting	\$23,913	\$2,429	\$54,680	\$3,300	\$57,980	\$0	\$57,980	9.84
ii) Building Envelope & Air Sealing	\$19,004	\$181	\$4,076	\$0	\$4,076	\$15,384	\$19,460	20.00
c) FD5 Stony Point HQ								
i) LED Lighting	\$19,435	\$2,135	\$48,071	\$2,420	\$50,491	\$0	\$50,491	9.10
ii) Building Envelope & Air Sealing	\$10,404	\$75	\$1,677	\$0	\$1,677	\$8,904	\$10,581	20.00
d) FD5 Trough Creek HQ								
i) LED Lighting	\$18,230	\$1,460	\$32,867	\$1,420	\$34,287	\$0	\$34,287	12.49
ii) Building Envelope & Air Sealing	\$7,054	\$91	\$2,057	\$0	\$2,057	\$5,234	\$7,291	20.00
e) FD5 Greenwood HQ								
i) LED Lighting	\$9,607	\$470	\$10,589	\$1,040	\$11,629	\$0	\$11,629	20.44
ii) Building Envelope & Air Sealing	\$10,625	\$79	\$1,783	\$0	\$1,783	\$9,045	\$10,828	20.00
6) Bald Eagle Forest District #7								
\$422,771	\$6,207	\$139,755	\$33,300	\$173,055	\$302,899	\$475,954	19.31	



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
a) RMC								
i) LED Lighting	\$66,100	\$2,800	\$63,047	\$14,580	\$77,627	\$10,100	\$87,727	20.00
ii) Building Envelope & Air Sealing	\$20,087	\$917	\$20,638	\$0	\$20,638	\$0	\$20,638	21.91
iii) Garage Door Upgrades	\$9,336	\$17	\$389	\$0	\$389	\$8,996	\$9,385	20.00
iv) HVAC System/Boiler Upgrades	\$6,111				\$0	\$6,111	\$6,111	N/A
b) FD7 Eastville HQ								
i) LED Lighting	\$19,528	\$1,039	\$23,386	\$2,260	\$25,646	\$0	\$25,646	18.79
ii) Building Envelope & Air Sealing	\$10,773	\$208	\$4,687	\$0	\$4,687	\$6,613	\$11,300	20.00
iii) HVAC/Boiler System Upgrades								
(1) Maintenance	\$32,939	-\$1,018	-\$22,910	\$6,000	-\$16,910	\$53,299	\$36,389	N/A
(2) Residence	\$31,291	-\$678	-\$15,273	\$6,000	-\$9,273	\$44,851	\$35,578	N/A
iv) Garage Door Upgrades	\$14,005	\$50	\$1,126	\$0	\$1,126	\$13,005	\$14,131	20.00
v) Residence Window Upgrades- McClure recommended allowance	\$47,195				\$0	\$47,195	\$47,195	N/A
c) FD7 Hickernell HQ								
i) LED Lighting	\$13,597	\$918	\$20,665	\$1,340	\$22,005	\$0	\$22,005	14.81
ii) Building Envelope & Air Sealing	\$14,339	\$200	\$4,511	\$0	\$4,511	\$10,339	\$14,850	20.00
iii) Garage Door Upgrades	\$9,337	\$28	\$627	\$0	\$627	\$8,777	\$9,404	20.00
iv) Residence Window Upgrades-McClure recommended allowance	\$45,050				\$0	\$45,050	\$45,050	N/A
d) FD7 NLV HQ								
i) LED Lighting	\$24,946	\$1,055	\$23,753	\$2,460	\$26,213	\$3,846	\$30,059	20.00
ii) Building Envelope & Air Sealing	\$14,339	\$200	\$4,511	\$0	\$4,511	\$10,339	\$14,850	20.00
iii) HVAC/Boiler System Upgrades								
e) FD7 Troxelville HQ								
i) LED Lighting	\$9,846	\$299	\$6,725	\$660	\$7,385	\$3,866	\$11,251	20.00
ii) Building Envelope & Air Sealing	\$10,609	\$116	\$2,606	\$0	\$2,606	\$8,289	\$10,895	20.00
iii) Garage Door Upgrades	\$23,343	\$56	\$1,267	\$0	\$1,267	\$22,223	\$23,490	20.00
7) Moshannon Forest District #9								
a) RMC								
i) LED Lighting	\$74,600	\$5,284	\$118,969	\$6,420	\$125,389	\$0	\$125,389	14.12



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
ii) Building Envelope & Air Sealing	\$26,614	\$338	\$7,606	\$0	\$7,606	\$19,854	\$27,460	20.00
b) FD9 Black Moshannon HQ								
i) LED Lighting	\$15,751	\$1,690	\$38,047	\$4,660	\$42,707	\$0	\$42,707	9.32
ii) Building Envelope & Air Sealing	\$18,749	\$1,178	\$26,522	\$0	\$26,522	\$0	\$26,522	15.92
iii) HVAC/Boiler System Upgrades	\$23,594	\$143	\$3,221	\$6,000	\$9,221	\$20,734	\$29,955	20.00
c) FD9 Quehanna HQ.								
i) LED Lighting	\$9,393	\$1,583	\$35,646	\$460	\$36,106	\$0	\$36,106	5.93
ii) Building Envelope & Air Sealing	\$38,503	\$192	\$4,323	\$0	\$4,323	\$34,663	\$38,986	20.00
iii) HVAC/Boiler System Upgrades(Karl Maul email 10/23/19 remove from scope)								
d) FD9 Dague Forest HQ								
i) LED Lighting	\$11,491	\$877	\$19,745	\$960	\$20,705	\$0	\$20,705	13.10
ii) Building Envelope & Air Sealing	\$18,102	\$108	\$2,428	\$0	\$2,428	\$15,942	\$18,370	20.00
8) Sproul Forest District #10								
a) RMC								
i) LED Lighting	\$43,664	\$2,604	\$58,636	\$8,726	\$67,362	\$0	\$67,362	16.77
ii) Building Envelope & Air Sealing	\$12,547	\$1,135	\$25,547	\$0	\$25,547	\$0	\$25,547	11.05
iii) HVAC/Boiler System Upgrades	\$111,054	\$233	\$5,248	\$18,000	\$23,248	\$106,394	\$129,642	20.00
iv) Domestic Hot Water (included in HVAC/Boiler System Upgrades above)								
b) FD10 Cooks Run HQ								
i) LED Lighting	\$11,903	\$1,284	\$28,910	\$3,423	\$32,333	\$0	\$32,333	9.27
ii) Building Envelope & Air Sealing	\$8,538	\$793	\$17,858	\$0	\$17,858	\$0	\$17,858	10.77
iii) HVAC System/Boiler Upgrades	\$80,591	\$739	\$16,643	\$12,000	\$28,643	\$65,811	\$94,454	20.00
c) FD10 Snow Shoe HQ								
i) LED Lighting	\$4,658	\$653	\$14,706	\$1,204	\$15,910	\$0	\$15,910	7.13
ii) Building Envelope & Air Sealing	\$4,896	\$439	\$9,885	\$0	\$9,885	\$0	\$9,885	11.15
d) FD10 Hyner Forest HQ								
i) LED Lighting	\$6,881	\$804	\$18,091	\$526	\$18,617	\$0	\$18,617	8.56
ii) Building Envelope & Air Sealing	\$3,387	\$303	\$6,825	\$0	\$6,825	\$0	\$6,825	11.18



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
9) Tiadaghton Forest District #12	\$357,672	\$22,701	\$511,117	\$35,903	\$547,020	\$132,990	\$680,010	9.90
Lighting District Wide	\$95,698	\$7,917	\$178,247	\$17,903	\$196,150	\$0	\$196,150	12.09
a) RMC								
i) LED Lighting								
ii) Building Envelope & Air Sealing	\$3,045	\$317	\$7,133	\$0	\$7,133	\$0	\$7,133	9.61
iii) Control Upgrades and Recommissioning	\$76,950	\$11,284	\$254,056	\$0	\$254,056	\$0	\$254,056	6.82
b) FD12 Jersey Mills HQ								
i) LED Lighting								
ii) Building Envelope & Air Sealing	\$14,290	\$910	\$20,498	\$0	\$20,498	\$0	\$20,498	15.70
iii) HVAC/Boiler System Upgrades (Karl Maul email on 10/23/19 remove from scope)								
iv) Garage Door Upgrades	\$4,668	\$16	\$360	\$0	\$360	\$4,348	\$4,708	20.00
c) FD12 Rauchtown HQ								
i) LED Lighting								
ii) Building Envelope & Air Sealing	\$6,354	\$653	\$14,705	\$0	\$14,705	\$0	\$14,705	9.73
iii) Furnace/DHW System Upgrades	\$33,599	-\$72	-\$1,628	\$6,000	\$4,372	\$35,039	\$39,411	20.00
iv) Garage Door Upgrades	\$18,675	\$102	\$2,306	\$0	\$2,306	\$16,635	\$18,941	20.00
d) FD12 Waterville HQ								
i) LED Lighting								
ii) Building Envelope & Air Sealing	\$3,625	\$384	\$8,651	\$0	\$8,651	\$0	\$8,651	9.44
iii) HVAC/Boiler System Upgrades (Karl Maul email on 10/23/19 remove from scope)								
iv) Control Upgrades and Recommissioning for systems tied to RMC building	\$36,053	\$627	\$14,122	\$12,000	\$26,122	\$23,513	\$49,635	20.00
v) Garage Door Upgrades	\$37,349	\$244	\$5,494	\$0	\$5,494	\$32,469	\$37,963	20.00
e) Pump House Structure								
i) HVAC/Boiler System Upgrade	\$27,366	\$319	\$7,173	\$0	\$7,173	\$20,986	\$28,159	20.00
10) Elk Forest District #13								
Lighting District Wide	\$93,562	\$8,514	\$191,694	\$15,646	\$207,340	\$0	\$207,340	10.99
a) RMC								



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
i) LED Lighting	\$2,538	\$239	\$5,382	\$0	\$5,382	\$0	\$5,382	10.62
ii) Building Envelope & Air Sealing								
b) FD13 Hick's Run HQ								
i) LED Lighting								
c) FD13 Brooks Run HQ								
i) LED Lighting	\$459	\$327	\$7,371	\$0	\$7,371	\$0	\$7,371	1.40
ii) Building Envelope & Air Sealing								
d) FD13 Sizerville HQ								
i) LED Lighting	\$10,123	\$760	\$17,102	\$0	\$17,102	\$0	\$17,102	13.32
ii) Building Envelope & Air Sealing								
11) Susquehannock Forest District #15	\$420,839	\$14,488	\$326,195	\$60,660	\$386,855	\$205,314	\$592,169	14.88
a) RMC								
i) LED Lighting	\$70,570	\$4,930	\$110,994	\$9,420	\$120,414	\$0	\$120,414	14.31
ii) Building Envelope & Air Sealing	\$28,091	\$1,072	\$24,143	\$0	\$24,143	\$6,651	\$30,794	20.00
iii) HVAC/Boiler System Upgrades	\$130,756	\$755	\$16,997	\$44,000	\$60,997	\$115,656	\$176,653	20.00
iv) Garage Door Upgrades	\$14,005	\$36	\$806	\$0	\$806	\$13,285	\$14,091	20.00
b) FD15 Cross Forks Forest HQ								
i) LED Lighting	\$32,627	\$2,131	\$47,977	\$1,900	\$49,877	\$0	\$49,877	15.31
ii) Building Envelope & Air Sealing	\$16,772	\$490	\$11,028	\$0	\$11,028	\$6,972	\$18,000	20.00
iii) Garage Door Upgrades	\$23,343	\$120	\$2,707	\$0	\$2,707	\$20,943	\$23,650	20.00
c) FD15 Lyman Run Forest HQ								
i) LED Lighting	\$14,666	\$1,142	\$25,720	\$2,000	\$27,720	\$0	\$27,720	12.84
ii) Building Envelope & Air Sealing	\$14,205	\$420	\$9,463	\$0	\$9,463	\$5,805	\$15,268	20.00
iii) Garage Door Upgrades	\$18,675	\$98	\$2,195	\$0	\$2,195	\$16,715	\$18,910	20.00
d) FD15 Bark Shanty HQ								
i) LED Lighting	\$23,162	\$2,560	\$57,631	\$3,340	\$60,971	\$0	\$60,971	9.05
ii) Building Envelope & Air Sealing	\$15,292	\$638	\$14,369	\$0	\$14,369	\$2,532	\$16,901	20.00
iii) Garage Door Upgrades	\$18,675	\$96	\$2,165	\$0	\$2,165	\$16,755	\$18,920	20.00
12) Tioga Forest District #16	\$84,358	\$6,553	\$147,532	\$14,480	\$162,012	\$0	\$162,012	12.87



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
a) RMC								
i) LED Lighting	\$34,661	\$3,264	\$73,487	\$7,108	\$80,595	\$0	\$80,595	10.62
ii) Building Envelope & Air Sealing	\$4,261	\$334	\$7,514	\$0	\$7,514	\$0	\$7,514	12.76
b) FD16 Ansonia HQ								
i) LED Lighting	\$19,441	\$1,488	\$33,503	\$3,686	\$37,189	\$0	\$37,189	13.07
ii) Building Envelope & Air Sealing	\$1,459	\$119	\$2,670	\$0	\$2,670	\$0	\$2,670	12.26
c) FD 16 Armenia HQ								
i) LED Lighting	\$20,413	\$1,060	\$23,874	\$3,686	\$27,560	\$0	\$27,560	19.26
ii) Building Envelope & Air Sealing	\$4,123	\$288	\$6,484	\$0	\$6,484	\$0	\$6,484	14.32
13) Mira Lloyd Dock RCC Forest District #21 ("Penn Nursery")								
	\$228,941	\$8,988	\$202,346	\$26,292	\$228,638	\$96,914	\$325,552	14.69
i) LED Lighting	\$61,787	\$5,476	\$123,287	\$14,292	\$137,579	\$0	\$137,579	11.28
ii) Building Envelope & Air Sealing	\$53,261	\$1,625	\$36,574	\$0	\$36,574	\$20,761	\$57,335	20.00
iii) Seed Extraction Storage Cooler Upgrades	\$13,565	\$36	\$807	\$0	\$807	\$12,845	\$13,652	20.00
iv) Control Upgrades and Recommissioning – Recommission Geothermal System and ERU (include boiler scope in v. below)	\$67,120	\$1,564	\$35,214	\$6,000	\$41,214	\$35,840	\$77,054	20.00
(1) McClure Recommended alternate pricing allowance/contingency for replacement of the energy recovery unit.	\$33,208	\$287	\$6,464	\$6,000	\$12,464	\$27,468	\$39,932	20.00
v) Boiler Upgrades (included with iv. above)								
14) Park Region 1 Office -included with Elk Forest District #13								
15) Bald Eagle State Park								
	\$262,757	\$6,911	\$155,586	\$37,708	\$193,294	\$131,993	\$325,287	18.92
a) LED Lighting	\$99,323	\$5,055	\$113,800	\$19,708	\$133,508	\$0	\$133,508	19.65
b) Building Envelope & Air Sealing	\$23,741	\$1,471	\$33,120	\$0	\$33,120	\$0	\$33,120	16.14
c) WWTP Sewage Meters- already in place								
d) Nature Center Recommissioning- select replacement of VRF System	\$41,756	\$66	\$1,485	\$0	\$1,485	\$40,436	\$41,921	20.00



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
e) Cottage/Yurt Heating- (4) Cottages/ (2) Yurts	\$28,826	\$0	\$0	\$6,000	\$6,000	\$28,826	\$34,826	N/A
f) HVAC System/Boiler Upgrades	\$69,111	\$319	\$7,181	\$12,000	\$19,181	\$62,731	\$81,912	20.00
16) Bendigo State Park	\$26,194	\$2,681	\$60,374	\$1,840	\$62,214	\$0	\$62,214	9.77
a) LED Lighting	\$15,846	\$965	\$21,731	\$1,840	\$23,571	\$0	\$23,571	16.42
b) Building Envelope & Air Sealing	\$10,348	\$1,716	\$38,643	\$0	\$38,643	\$0	\$38,643	6.03
17) Black Moshannon State Park	\$432,109	\$7,993	\$179,955	\$45,420	\$225,375	\$314,046	\$539,421	14.77
a) LED Lighting	\$67,704	\$4,312	\$97,086	\$15,420	\$112,506	\$0	\$112,506	15.70
b) Building Envelope & Air Sealing	\$19,746	\$1,940	\$43,675	\$0	\$43,675	\$0	\$43,675	10.18
c) Restroom DHW Upgrades- (1) Year-Round Restrooms	\$6,773	\$549	\$12,368	\$2,000	\$14,368	\$0	\$14,368	12.34
d) Cottage Heating- (2) Cottages	\$9,973	\$0	\$0	\$2,000	\$2,000	\$9,973	\$11,973	N/A
e) Cabin HVAC- (7) Cabins	\$241,728	\$959	\$21,582	\$14,000	\$35,582	\$222,548	\$258,130	20.00
i) (5) cabins provided with typical scope.								
ii) Cabin #13								
iii) Cabin #14								
f) HVAC System/Boiler Upgrades	\$86,185	\$233	\$5,244	\$12,000	\$17,244	\$81,525	\$98,769	20.00
18) Chapman State Park	\$235,065	\$8,027	\$180,732	\$20,860	\$201,592	\$135,418	\$337,010	12.41
a) LED Lighting	\$48,528	\$4,658	\$104,876	\$7,860	\$112,736	\$0	\$112,736	10.42
b) Building Envelope & Air Sealing	\$41,999	\$2,913	\$65,590	\$0	\$65,590	\$0	\$65,590	14.42
c) Cottage/Yurt Heating- (3) Cottages/ (2) Yurts	\$23,840	\$0	\$0	\$5,000	\$5,000	\$23,840	\$28,840	N/A
d) HVAC System/Boiler Upgrades	\$120,698	\$456	\$10,266	\$8,000	\$18,266	\$111,578	\$129,844	20.00
e) DHW Upgrades (included with HVAC System/Boiler Upgrade above)								
19) Cherry Springs State Park	\$6,627	\$869	\$19,567	\$720	\$20,287	\$0	\$20,287	7.63
a) LED Lighting	\$6,627	\$869	\$19,567	\$720	\$20,287	\$0	\$20,287	7.63
20) Denton Hill State Park	\$42,325	\$10,762	\$242,298	\$5,100	\$247,398	\$0	\$247,398	3.93
a) LED Lighting	\$42,325	\$10,762	\$242,298	\$5,100	\$247,398	\$0	\$247,398	3.93
21) Elk Country Visitor Center	\$71,095	\$2,645	\$59,574	\$8,130	\$67,704	\$16,047	\$83,751	20.81



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
a) LED Lighting	\$47,773	\$2,245	\$50,554	\$6,130	\$56,684	\$0	\$56,684	21.28
b) Building Envelope & Air Sealing	\$6,375	\$355	\$8,003	\$0	\$8,003	\$0	\$8,003	17.96
c) Homestead HVAC	\$16,947	\$45	\$1,017	\$2,000	\$3,017	\$16,047	\$19,064	20.00
22) Hills Creek State Park								
	\$605,752	\$15,156	\$341,238	\$56,960	\$398,198	\$436,668	\$834,866	11.16
a) LED Lighting	\$48,464	\$9,125	\$205,449	\$11,960	\$217,409	\$0	\$217,409	5.31
b) Building Envelope & Air Sealing	\$115,506	\$3,567	\$80,312	\$0	\$80,312	\$44,166	\$124,478	20.00
c) Shower House DHW Upgrades- (3) Shower Houses	\$59,405	\$377	\$8,486	\$12,000	\$20,486	\$51,865	\$72,351	20.00
d) Cottage/Yurt Heating- (3) Cottages/ (2) Yurts	\$23,047	\$0	\$0	\$5,000	\$5,000	\$23,047	\$28,047	N/A
e) Cabin HVAC- (10) Cabins	\$330,966	\$1,957	\$44,067	\$20,000	\$64,067	\$291,826	\$355,893	20.00
f) HVAC System/Boiler Upgrades	\$28,364	\$130	\$2,924	\$8,000	\$10,924	\$25,764	\$36,688	20.00
g) DHW System Upgrades (included with HVAC System/Boiler Upgrade above)								
23) Hyner Run State Park								
	\$50,360	\$3,508	\$78,959	\$9,190	\$88,149	\$16,264	\$104,413	9.72
a) LED Lighting	\$23,939	\$2,708	\$60,967	\$5,190	\$66,157	\$0	\$66,157	8.84
b) Building Envelope & Air Sealing	\$6,937	\$639	\$14,376	\$0	\$14,376	\$0	\$14,376	10.86
c) Shower House DHW Upgrades- (1) Shower House	\$19,484	\$161	\$3,616	\$4,000	\$7,616	\$16,264	\$23,880	20.00
24) Kettle Creek State Park								
	\$89,760	\$7,069	\$159,175	\$9,160	\$168,335	\$16,024	\$184,359	10.43
a) LED Lighting	\$34,575	\$5,151	\$115,981	\$7,160	\$123,141	\$0	\$123,141	6.71
b) Building Envelope & Air Sealing	\$35,701	\$1,745	\$39,295	\$0	\$39,295	\$0	\$39,295	20.46
c) Shower House DHW Upgrades- (1) Shower House	\$19,484	\$173	\$3,899	\$2,000	\$5,899	\$16,024	\$21,923	20.00
25) Kinzua Bridge State Park								
	\$64,071	\$4,969	\$111,859	\$11,620	\$123,479	\$0	\$123,479	12.89
a) LED Lighting	\$55,840	\$4,259	\$95,878	\$11,620	\$107,498	\$0	\$107,498	13.11
b) Building Envelope & Air Sealing	\$8,231	\$710	\$15,981	\$0	\$15,981	\$0	\$15,981	11.59
26) Leonard Harrison State Park								
	\$98,063	\$4,554	\$102,539	\$15,642	\$118,181	\$44,008	\$162,189	11.87
a) LED Lighting	\$24,854	\$2,874	\$64,710	\$5,642	\$70,352	\$0	\$70,352	8.65
b) Building Envelope & Air Sealing	\$4,759	\$487	\$10,966	\$0	\$10,966	\$0	\$10,966	9.77
c) Shower House DHW Upgrades- (1) Shower House	\$19,802	\$961	\$21,633	\$4,000	\$25,633	\$0	\$25,633	20.61



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
d) HVAC/Boiler System Upgrades	\$48,648	\$232	\$5,230	\$6,000	\$11,230	\$44,008	\$55,238	20.00
27) Little Pine State Park	\$190,705	\$6,085	\$136,996	\$35,155	\$172,151	\$71,486	\$243,637	19.59
a) LED Lighting	\$69,554	\$3,290	\$74,077	\$10,155	\$84,232	\$0	\$84,232	21.14
b) Building Envelope & Air Sealing	\$9,245	\$774	\$17,420	\$0	\$17,420	\$0	\$17,420	11.94
c) Shower House DHW Upgrades- (1) Shower House	\$19,484	\$595	\$13,404	\$2,000	\$15,404	\$7,584	\$22,988	20.00
d) HVAC/Boiler System Upgrades	\$70,007	\$1,426	\$32,095	\$18,000	\$50,095	\$41,487	\$91,582	20.00
e) Cottage/Yurt Heating- (3) Cottages/ (2) Yurts	\$22,415	\$0	\$0	\$5,000	\$5,000	\$22,415	\$27,415	N/A
28) Lyman Run State Park	\$101,484	\$7,312	\$164,620	\$9,900	\$174,520	\$0	\$174,520	13.88
a) LED Lighting	\$47,090	\$4,884	\$109,963	\$9,900	\$119,863	\$0	\$119,863	9.64
b) Building Envelope & Air Sealing	\$54,394	\$2,428	\$54,657	\$0	\$54,657	\$0	\$54,657	22.40
29) Mount Pisgah State Park	\$1,584,520	\$10,535	\$237,169	\$218,513	\$455,682	\$1,405,063	\$1,860,745	17.03
a) LED Lighting	\$14,968	\$2,063	\$46,447	\$4,513	\$50,960	\$0	\$50,960	7.26
b) Building Envelope & Air Sealing	\$13,369	\$916	\$20,627	\$0	\$20,627	\$0	\$20,627	14.59
c) Shower House DHW Upgrades- (1) Shower House	\$20,329	\$51	\$1,145	\$2,000	\$3,145	\$19,309	\$22,454	20.00
d) HVAC System/Boiler Upgrades	\$85,854	\$931	\$20,951	\$12,000	\$32,951	\$67,234	\$100,185	20.00
e) On Lot Sewage System- Not Included	\$1,450,000	\$6,574	\$147,999	\$200,000	\$347,999	\$1,318,520	\$1,666,519	N/A
30) Ole Bull State Park	\$191,830	\$9,540	\$214,773	\$33,360	\$248,133	\$101,985	\$350,118	9.42
a) LED Lighting	\$38,315	\$5,716	\$128,687	\$13,360	\$142,047	\$0	\$142,047	6.70
b) Building Envelope & Air Sealing	\$33,270	\$2,911	\$65,549	\$0	\$65,549	\$0	\$65,549	11.43
c) Shower House DHW Upgrades- (2) Shower Houses	\$39,603	\$592	\$13,319	\$8,000	\$21,319	\$27,763	\$49,082	20.00
d) HVAC System/Boiler Upgrades	\$41,159	\$321	\$7,218	\$12,000	\$19,218	\$34,739	\$53,957	20.00
e) Lodge Cooling	\$39,483	\$0	\$0	\$0	\$0	\$39,483	\$39,483	N/A
31) Parker Dam State Park	\$609,923	\$5,994	\$134,952	\$95,820	\$230,772	\$516,130	\$746,902	15.65
a) LED Lighting	\$93,793	\$17,342	\$390,449	\$57,720	\$448,169	\$0	\$448,169	5.41
b) HVAC System/Boiler Upgrades	\$8,535	\$0	\$0	\$0	\$0	\$8,535	\$8,535	N/A
c) Natural Gas Well Review/Alternate Fuel Source	\$507,595	-\$11,348	-\$255,497	\$38,100	-\$217,397	\$507,595	\$290,198	N/A



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
32) Poe Paddy State Park	\$6,758	\$251	\$5,653	\$420	\$6,073	\$1,738	\$7,811	20.00
a) LED Lighting	\$6,758	\$251	\$5,653	\$420	\$6,073	\$1,738	\$7,811	20.00
33) Poe Valley State Park	\$45,823	\$1,042	\$23,465	\$6,200	\$29,665	\$24,983	\$54,648	20.00
a) LED Lighting	\$14,243	\$570	\$12,841	\$2,200	\$15,041	\$2,843	\$17,884	20.00
b) Building Envelope & Air Sealing	\$11,634	\$472	\$10,624	\$0	\$10,624	\$2,194	\$12,818	20.00
c) Cottage Heating- (4) Cottages	\$19,946	\$0	\$0	\$4,000	\$4,000	\$19,946	\$23,946	N/A
34) Ravensburg State Park	\$23,151	\$430	\$9,672	\$2,865	\$12,537	\$17,144	\$29,681	13.97
a) LED Lighting	\$3,667	\$313	\$7,042	\$865	\$7,907	\$0	\$7,907	11.72
b) Shower House DHW Upgrades- (1) Shower House	\$19,484	\$117	\$2,630	\$2,000	\$4,630	\$17,144	\$21,774	20.00
35) Raymond B. Winter State Park	\$117,638	\$5,065	\$114,017	\$20,420	\$134,437	\$20,804	\$155,241	19.12
a) LED Lighting	\$73,089	\$3,861	\$86,919	\$15,420	\$102,339	\$0	\$102,339	18.93
b) Building Envelope & Air Sealing	\$10,105	\$522	\$11,742	\$0	\$11,742	\$0	\$11,742	19.36
c) Shower House DHW Upgrades- (1) Shower House	\$19,484	\$682	\$15,356	\$2,000	\$17,356	\$5,844	\$23,200	20.00
d) Cottage Heating- (3) Cottages	\$14,960	\$0	\$0	\$3,000	\$3,000	\$14,960	\$17,960	N/A
36) Reeds Gap State Park	\$98,991	\$5,466	\$123,050	\$5,320	\$128,370	\$28,917	\$157,287	12.82
a) LED Lighting	\$36,614	\$3,793	\$85,387	\$5,320	\$90,707	\$0	\$90,707	9.65
b) Building Envelope & Air Sealing	\$62,377	\$1,673	\$37,663	\$0	\$37,663	\$28,917	\$66,580	20.00
37) Shikellamy State Park	\$34,991	\$5,765	\$129,783	\$6,318	\$136,101	\$0	\$136,101	6.07
a) LED Lighting	\$27,749	\$5,244	\$118,058	\$6,318	\$124,376	\$0	\$124,376	5.29
b) Building Envelope & Air Sealing	\$7,242	\$521	\$11,725	\$0	\$11,725	\$0	\$11,725	13.90
38) Simon B. Elliott State Park	\$9,961	\$1,526	\$34,349	\$5,440	\$39,789	\$0	\$39,789	6.53
a) LED Lighting	\$7,259	\$1,234	\$27,783	\$5,440	\$33,223	\$0	\$33,223	5.88
b) Building Envelope & Air Sealing	\$2,702	\$292	\$6,566	\$0	\$6,566	\$0	\$6,566	9.25
39) Sinnemahoning State Park	\$1,088,087	\$16,516	\$371,859	\$163,180	\$535,039	\$849,553	\$1,384,592	14.44
a) LED Lighting	\$62,603	\$7,464	\$168,041	\$13,180	\$181,221	\$0	\$181,221	8.39
b) Building Envelope & Air Sealing	\$53,791	\$2,945	\$66,309	\$0	\$66,309	\$0	\$66,309	18.27



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
c) Shower House DHW Upgrades- (1) Shower House	\$16,688	\$726	\$16,344	\$0	\$16,344	\$2,168	\$18,512	20.00
d) Restroom DHW Upgrades- (6) Year-Round Restrooms	\$42,542	\$997	\$22,446	\$14,000	\$36,446	\$22,602	\$59,048	20.00
e) HVAC System/Boiler Upgrades	\$67,683	\$618	\$13,921	\$12,000	\$25,921	\$55,323	\$81,244	20.00
f) Park Office	\$561,950	\$3,721	\$83,781	\$52,000	\$135,781	\$487,530	\$623,311	20.00
i) McClure Recommended alternate pricing allowance/contingency for central plant equipment	\$222,833	\$0	\$0	\$70,000	\$70,000	\$222,833	\$292,833	N/A
g) DHW Upgrades (included with HVAC System/Boiler Upgrade above)								
h) Brooks Run Cabin HVAC	\$59,997	\$45	\$1,017	\$2,000	\$3,017	\$59,097	\$62,114	20.00
40) Sizerville State Park								
	\$127,360	\$3,558	\$80,119	\$19,900	\$100,019	\$69,001	\$169,020	16.40
a) LED Lighting	\$26,159	\$1,948	\$43,865	\$3,900	\$47,765	\$0	\$47,765	13.43
b) Building Envelope & Air Sealing	\$43,799	\$938	\$21,127	\$0	\$21,127	\$25,039	\$46,166	20.00
c) Shower House DHW Upgrades- (1) Shower House	\$19,802	\$412	\$9,279	\$4,000	\$13,279	\$11,562	\$24,841	20.00
d) HVAC System/Boiler Upgrades	\$37,600	\$260	\$5,848	\$12,000	\$17,848	\$32,400	\$50,248	20.00
i) Residence 1 – The existing propane-fired, HW boiler shall be replaced with a new propane-fired boiler in the same location.								
ii) Residence 3 – The existing propane-fired, HW boiler shall be replaced with a new propane-fired boiler in the same location.								
41) Park Region 3 Office-								
	\$106,677	\$7,353	\$165,536	\$9,740	\$175,276	\$19,036	\$194,312	11.92
a) LED Lighting	\$15,343	\$2,058	\$46,326	\$1,740	\$48,066	\$0	\$48,066	7.46
b) Building Envelope & Air Sealing	\$68,338	\$5,097	\$114,754	\$0	\$114,754	\$0	\$114,754	13.41
c) DHW Upgrades	\$22,996	\$198	\$4,456	\$8,000	\$12,456	\$19,036	\$31,492	20.00
42) Big Spring State Forest Picnic Area								
43) Blue Knob State Park								
	\$179,100	\$6,265	\$141,022	\$52,860	\$193,882	\$71,895	\$265,777	17.11
a) LED Lighting	\$24,259	\$1,826	\$41,102	\$4,860	\$45,962	\$0	\$45,962	13.29



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
b) Building Envelope & Air Sealing	\$46,446	\$2,614	\$58,841	\$0	\$58,841	\$0	\$58,841	17.77
c) Shower House DHW Upgrades- (1) Shower House, (1) Group Camp Shower House	\$39,256	\$1,141	\$25,678	\$18,000	\$43,678	\$16,436	\$60,114	20.00
d) Restroom DHW Upgrades- (1) Year-Round Restrooms	\$7,119	\$193	\$4,349	\$0	\$4,349	\$3,259	\$7,608	20.00
e) Cabin HVAC- (3) Cabins	\$44,198	\$491	\$11,052	\$30,000	\$41,052	\$34,378	\$75,430	20.00
f) HVAC System/Boiler Upgrades (removed from scope by Region 3)								
g) Twin Fawn House Cooling	\$17,822	\$0	\$0	\$0	\$0	\$17,822	\$17,822	N/A
44) Boyd Big Tree Preserve Conservation Area	\$2,963	\$373	\$8,390	\$639	\$9,029	\$0	\$9,029	7.94
a) LED Lighting	\$2,963	\$373	\$8,390	\$639	\$9,029	\$0	\$9,029	7.94
45) Caledonia State Park	\$219,712	\$9,909	\$223,086	\$19,180	\$242,266	\$56,787	\$299,053	16.44
a) LED Lighting	\$124,945	\$8,193	\$184,456	\$17,180	\$201,636	\$0	\$201,636	15.25
b) Building Envelope & Air Sealing	\$35,800	\$1,607	\$36,185	\$0	\$36,185	\$0	\$36,185	22.28
c) Shower House DHW Upgrades- (1) Shower House	\$19,484	\$109	\$2,445	\$2,000	\$4,445	\$17,304	\$21,749	20.00
d) Cottage #2 Cooling	\$39,483	\$0	\$0	\$0	\$0	\$39,483	\$39,483	N/A
46) Canoe Creek State Park	\$532,361	\$17,736	\$399,325	\$51,020	\$450,345	\$317,538	\$767,883	12.11
a) LED Lighting	\$68,254	\$9,352	\$210,548	\$19,020	\$229,568	\$0	\$229,568	7.30
b) Building Envelope & Air Sealing	\$38,669	\$2,989	\$67,305	\$0	\$67,305	\$0	\$67,305	12.94
c) Shower House DHW Upgrades- (1) Shower House	\$19,051	\$416	\$9,364	\$2,000	\$11,364	\$10,731	\$22,095	20.00
d) Restroom DHW Upgrades- (1) Year-Round Restrooms	\$6,830	\$204	\$4,591	\$2,000	\$6,591	\$2,750	\$9,341	20.00
e) Cabin HVAC- (8) Cabins	\$261,816	\$1,180	\$26,575	\$16,000	\$42,575	\$238,216	\$280,791	20.00
f) HVAC System/Boiler Upgrades	\$137,741	\$3,595	\$80,942	\$12,000	\$92,942	\$65,841	\$158,783	20.00
47) Codorus State Park	\$683,767	\$23,635	\$532,114	\$72,060	\$604,174	\$334,003	\$938,177	14.80
a) LED Lighting	\$183,304	\$15,312	\$344,724	\$31,060	\$375,784	\$0	\$375,784	11.97
b) Building Envelope & Air Sealing	\$40,419	\$1,752	\$39,445	\$0	\$39,445	\$5,379	\$44,824	20.00
c) Shower House DHW Upgrades- (5) Shower Houses	\$97,738	\$1,355	\$30,506	\$12,000	\$42,506	\$70,638	\$113,144	20.00
d) Cottage Heating- (3) Cottages	\$23,840	\$0	\$0	\$5,000	\$5,000	\$23,840	\$28,840	N/A



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
e) HVAC System/Boiler Upgrades	\$156,423	-\$105	-\$2,360	\$24,000	\$21,640	\$158,523	\$180,163	20.00
f) Water Conservation	\$182,043	\$5,321	\$119,799	\$0	\$119,799	\$75,623	\$195,422	20.00
48) Colonel Denning State Park								
	\$203,204	\$4,649	\$104,643	\$31,522	\$136,165	\$161,583	\$297,748	8.95
a) LED Lighting	\$36,781	\$4,761	\$107,185	\$7,522	\$114,707	\$0	\$114,707	7.73
b) Building Envelope & Air Sealing	\$9,431	\$242	\$5,439	\$0	\$5,439	\$4,591	\$10,030	20.00
c) HVAC System/Boiler Upgrades	\$156,992	-\$354	-\$7,981	\$24,000	\$16,019	\$156,992	\$173,011	N/A
49) Cowan's Gap State Park								
	\$87,803	\$10,088	\$227,104	\$18,520	\$245,624	\$0	\$245,624	8.70
a) LED Lighting	\$71,550	\$8,527	\$191,969	\$18,520	\$210,489	\$0	\$210,489	8.39
b) Building Envelope & Air Sealing	\$16,253	\$1,561	\$35,135	\$0	\$35,135	\$0	\$35,135	10.41
e) HVAC System/Boiler Upgrades (Removed from scope by Region 3)						\$0		
50) Fowler's Hollow State Park								
	\$2,416	\$260	\$5,862	\$414	\$6,276	\$0	\$6,276	9.29
a) LED Lighting	\$1,465	\$152	\$3,431	\$414	\$3,845	\$0	\$3,845	9.64
b) Building Envelope & Air Sealing	\$951	\$108	\$2,431	\$0	\$2,431	\$0	\$2,431	8.81
51) Gifford Pinchot State Park								
	\$1,265,951	\$26,888	\$605,377	\$132,960	\$738,337	\$913,124	\$1,651,461	13.12
a) LED Lighting	\$128,511	\$15,012	\$337,975	\$33,960	\$371,935	\$0	\$371,935	8.56
b) Building Envelope & Air Sealing	\$61,296	\$3,725	\$83,859	\$0	\$83,859	\$0	\$83,859	16.46
c) Shower House DHW Upgrades- (7) Shower Houses	\$311,322	\$3,655	\$82,308	\$30,000	\$112,308	\$238,222	\$350,530	20.00
d) Cottage/Yurt Heating- (3) Cottages/ (2) Yurts	\$22,255	\$0	\$0	\$5,000	\$5,000	\$22,255	\$27,255	N/A
e) Cabin HVAC- (10) Cabins	\$331,124	\$4,367	\$98,316	\$20,000	\$118,316	\$243,784	\$362,100	20.00
f) HVAC System/Boiler Upgrades	\$326,764	-\$92	-\$2,064	\$44,000	\$41,936	\$328,604	\$370,540	20.00
g) DHW Upgrades (included in HVAC System/Boiler Upgrades)								
h) Window Upgrades	\$84,679	\$221	\$4,983	\$0	\$4,983	\$80,259	\$85,242	20.00
i) Solar PV Water Treatment and Wastewater Treatment Plants(per Jarod West email 10/8/19 at direction of John Dubaich)								
52) Greenwood Furnace State Park								
	\$285,951	\$13,021	\$293,164	\$75,100	\$368,264	\$199,177	\$567,441	6.66



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
a) LED Lighting	\$74,698	\$12,076	\$271,891	\$17,100	\$288,991	\$0	\$288,991	6.19
b) Building Envelope & Air Sealing	\$4,776	\$580	\$13,051	\$0	\$13,051	\$0	\$13,051	8.23
c) Shower House DHW Upgrades- (1) Shower House	\$34,237	\$207	\$4,665	\$30,000	\$34,665	\$30,097	\$64,762	20.00
d) HVAC System/Boiler Upgrades	\$172,240	\$158	\$3,557	\$28,000	\$31,557	\$169,080	\$200,637	20.00
e) DHW Upgrades (included in HVAC System/Boiler Upgrades)								
53) Joseph E. Ibberson Conservation Area								
	\$1,414	\$69	\$1,556	\$451	\$2,007	\$0	\$2,007	20.49
a) LED Lighting	\$1,414	\$69	\$1,556	\$451	\$2,007	\$0	\$2,007	20.49
54) Kings Gap Environmental Ed. Center								
	\$71,026	\$6,471	\$145,680	\$23,280	\$168,960	\$8,047	\$177,007	9.73
a) LED Lighting	\$62,979	\$6,471	\$145,680	\$23,280	\$168,960	\$0	\$168,960	9.73
b) Solar Vent Fan Replacement	\$8,047	\$0	\$0	\$0	\$0	\$8,047	\$8,047	N/A
55) Little Buffalo State Park								
	\$274,209	\$13,795	\$310,586	\$38,830	\$349,416	\$104,278	\$453,694	12.32
a) LED Lighting	\$141,517	\$11,954	\$269,138	\$22,830	\$291,968	\$0	\$291,968	11.84
b) Building Envelope & Air Sealing	\$15,954	\$1,218	\$27,430	\$0	\$27,430	\$0	\$27,430	13.10
c) HVAC System/Boiler Upgrades	\$89,759	\$179	\$4,025	\$16,000	\$20,025	\$86,179	\$106,204	20.00
d) Shower House DHW Upgrades	\$26,979	\$444	\$9,993	\$0	\$9,993	\$18,099	\$28,092	20.00
56) Mont Alto State Park								
57) Penn-Roosevelt State Park								
58) Pine Grove Furnace State Park								
	\$323,450	\$15,939	\$358,846	\$57,340	\$416,186	\$166,832	\$583,018	9.83
a) LED Lighting	\$108,656	\$12,704	\$286,017	\$41,340	\$327,357	\$0	\$327,357	8.55
b) Building Envelope & Air Sealing	\$19,282	\$1,801	\$40,553	\$0	\$40,553	\$0	\$40,553	10.71
c) Cabin HVAC- (1) Cabin	\$42,536	\$41	\$922	\$2,000	\$2,922	\$41,716	\$44,638	20.00
d) HVAC System/Boiler Upgrades	\$152,976	\$1,393	\$31,354	\$14,000	\$45,354	\$125,116	\$170,470	20.00
e) DHW Upgrades (included with HVAC System/Boiler Upgrade)								
f) Electrical Upgrades								



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
59) Prince Gallitzin State Park	\$1,751,264	\$48,738	\$1,097,317	\$99,460	\$1,196,777	\$1,275,736	\$2,472,513	9.76
a) LED Lighting	\$142,434	\$28,440	\$640,324	\$20,460	\$660,784	\$0	\$660,784	5.01
b) Building Envelope & Air Sealing	\$103,528	\$6,664	\$150,033	\$0	\$150,033	\$0	\$150,033	15.54
c) Shower House DHW Upgrades- (4) Shower Houses	\$103,526	\$7,332	\$165,066	\$16,000	\$181,066	\$0	\$181,066	14.12
d) Cottage Heating- (5) Cottages	\$24,993	\$0	\$0	\$5,000	\$5,000	\$24,993	\$29,993	N/A
e) Cabin HVAC- (10) Cabins	\$391,007	\$2,147	\$48,344	\$20,000	\$68,344	\$348,067	\$416,411	20.00
f) Campground Water Line Replacement	\$810,688	\$0	\$0	\$0	\$0	\$810,688	\$810,688	N/A
g) HVAC System/Boiler Upgrades	\$175,088	\$4,155	\$93,550	\$38,000	\$131,550	\$91,988	\$223,538	20.00
h) DHW Upgrades (included with HVAC System/Boiler Upgrades above)								
i) Solar PV – Water Treatment and Wastewater Treatment Plants(per Jarod West email 10/8/19 at direction of John Dubaich)								
60) Samuel S. Lewis State Park	\$65,588	\$1,082	\$24,360	\$8,080	\$32,440	\$56,409	\$88,849	8.48
a) LED Lighting	\$3,999	\$823	\$18,536	\$2,080	\$20,616	\$0	\$20,616	4.86
b) Building Envelope & Air Sealing	\$2,303	\$22	\$498	\$0	\$498	\$1,863	\$2,361	20.00
c) HVAC System/Boiler Upgrades	\$30,136	\$237	\$5,326	\$6,000	\$11,326	\$25,396	\$36,722	20.00
d) Roofing Upgrades	\$29,150	\$0	\$0	\$0	\$0	\$29,150	\$29,150	N/A
61) Shawnee State Park	\$302,443	\$22,628	\$509,426	\$59,120	\$568,546	\$82,031	\$650,577	9.74
a) LED Lighting	\$110,274	\$15,023	\$338,230	\$32,120	\$370,350	\$0	\$370,350	7.34
b) Building Envelope & Air Sealing	\$52,558	\$4,726	\$106,392	\$0	\$106,392	\$0	\$106,392	11.12
c) Shower House DHW Upgrades- (2) Shower Houses	\$52,918	\$2,327	\$52,383	\$22,000	\$74,383	\$6,378	\$80,761	20.00
d) Restroom DHW Upgrades- (3) Year-Round Restrooms	\$18,759	\$552	\$12,421	\$0	\$12,421	\$7,719	\$20,140	20.00
e) Cottage/Yurt Heating- (3) Cottages/ (2) Yurt	\$29,549	\$0	\$0	\$5,000	\$5,000	\$29,549	\$34,549	N/A
f) Lakeside Lodge Cooling	\$38,385	\$0	\$0	\$0	\$0	\$38,385	\$38,385	N/A
62) Susquehannock State Park	\$15,923	\$2,085	\$46,932	\$880	\$47,812	\$0	\$47,812	7.64
a) LED Lighting	\$7,979	\$1,290	\$29,038	\$880	\$29,918	\$0	\$29,918	6.19
b) Building Envelope & Air Sealing	\$7,944	\$795	\$17,894	\$0	\$17,894	\$0	\$17,894	9.99



Scopes	Costs	Annual Energy Savings	Total Energy Savings	Total Operational & Maintenance Savings	Total Savings (4+5)	Energy Related Cost Savings	Total Savings (4+5+7)	Simple Payback (2-7)/3
63) Trough Creek State Park								
	\$124,782	\$6,939	\$156,228	\$13,380	\$169,608	\$46,203	\$215,811	11.32
a) LED Lighting	\$14,542	\$3,679	\$82,827	\$5,380	\$88,207	\$0	\$88,207	3.95
b) Building Envelope & Air Sealing	\$16,936	\$1,126	\$25,352	\$0	\$25,352	\$0	\$25,352	15.04
c) HVAC System/Boiler Upgrade	\$47,101	\$2,134	\$48,049	\$8,000	\$56,049	\$0	\$56,049	22.07
d) DHW Upgrades (included with HVAC System/Boiler Upgrades above)								
e) Lodge Cooling	\$46,203	\$0	\$0	\$0	\$0	\$46,203	\$46,203	N/A
64) Warriors Path State Park								
65) Whipple Dam State Park								
Sub-Totals	\$15,882,776	\$513,796	\$11,567,640	\$1,980,562	\$13,548,202	\$9,645,203	\$23,193,405	12.14
Bond	\$99,355							
Contingency	\$476,483							
Total	\$16,458,615							

3. Scope of Work

This section of the IGA report details the specific scopes of work associated with each site. Many sites receive the same general scopes of work, such as lighting, building envelop upgrades, and fuel conversions, which are generally described below with any specific details concerning each site described within that site’s scope of work. The table below indicates the general scopes of work for all considered measures.

ECM	General Description	Number of Sites
LED Lighting	Replacement of existing light fixtures or lamps with new LED fixtures or lamps	88
Building Envelope	Air sealing of penetrations/cracks, door weatherstripping/sweeps, added insulation	77
Roofing Upgrades	Repair or replacement of roofing systems	1
Window Upgrades	Replacement of existing windows	4
Garage Door Upgrades	Replacement of existing garage doors	12
Storage Upgrades	Air sealing and insulating of cold storage areas	1
HVAC System Upgrades	Upgrades or replacements of terminal HVAC equipment and distribution systems	22
DHW System Upgrades	Replacement of DHW systems, including fuel conversions	10
Boiler/Furnace Upgrades	Upgrades or replacements of central boilers/furnaces including fuel conversions	21
Controls/ Recommissioning	Upgrades or replacements of controls systems, including recommissioning of systems	6
Residence HVAC/Boiler/DHW	Upgrades or replacements of central boilers/furnaces or terminal HVAC equipment including fuel conversions at Residences	12
Cabin HVAC	HVAC equipment installations	13
Cottage/Yurt Heating	HVAC equipment installations	11
Shower House DHW Upgrades	Replacement of DHW systems, including fuel conversions	20
Restroom DHW Upgrades	Replacement of DHW systems, including fuel conversions	5
Water Conservation	Upgrades or replacements for toilets, urinals, showers, and lavatories	1
Solar	Installation of photovoltaic solar arrays to supplement water/ wastewater treatment plants	0
Solar Vent Fan	Installation of solar powered exhaust fans	1
Sewage Metering	Installation of meters for monitoring wastewater inflows	0
Gas Well/Alternate Fuel Source	Upgrades to fuel delivery systems, including fuel conversions	1
Underground Utility Replacement	Replacement of underground utility distribution systems	1
EV Charging Station	Installation of electric vehicle charging stations	1
On Lot Sewage System Upgrades	Upgrades and replacement of existing wastewater system to on lot style system	1

General Conditions and Assumptions

For the below listed scopes of work, McClure Company will provide the necessary design, documentation, labor, materials, and equipment, along with the required post construction services for training, commissioning, and measurement and verification for a turnkey solution at each site.

Each site's work will be fully coordinated during preconstruction with McClure's Project Manager and Site Project Manager to minimize disruptions to the site's operation. Special consideration has been given to State Park sites with campgrounds and impacts to operation during prime seasons.

McClure Company will be responsible for applicable safety, code, and health standard compliances, along with any required site clearance documentation, to maintain a clean, safe, and productive working environment for the scopes described below. McClure will be responsible for code compliance on the proposed scope of work only. Existing to remain or existing code deficiencies not specifically addressed through the proposed scope determined during the course of construction will be noted to DCNR/DGS.

Design documentation, such as engineering drawings or specifications, will be provided as needed for approval or completion of work. McClure will provide all required permits and provide a project schedule for the overall project as well as short term interval schedules (as needed) for site specific work.

General Assumptions and Exclusions

The following indicate the general assumptions and exclusions that apply to the scopes of work described below. Not all general assumptions or exclusions will apply to every scope item or site. Specific assumptions and exclusions are included within each site's scope of work descriptions if applicable.

Assumptions

- Existing to remain equipment is in operable condition
- Modifications to existing operating parameters, including but not limited to schedules or set points, is capable to be implemented on existing to remain equipment
- Existing site infrastructure and utilities are sufficient to support installation of any new equipment unless otherwise noted
- Existing control systems, including valves, dampers, controllers, safeties, and wiring is adequate for operation of existing to remain equipment and support any new equipment unless otherwise noted
- Drawings used to develop scope of work are accurate to site conditions
- For fuel conversion sites, the site is responsible for providing and connecting the fuel storage, along with procurement of fuel supplier. McClure will provide necessary connection points at the exterior of the building
- Existing building infrastructure proposed to be reused is in operable condition

Exclusions

- Testing and Balancing of existing to remain equipment
- Resolution of existing code or life safety deficiencies not addressed through the scope of work below.
- Remediation of hazardous materials, including but not limited to asbestos or lead paint, not in the near area of work performed by McClure
- Fuel storage and procurement unless otherwise noted

Warranties

For all General ECMs refer to General ECM description for details on warranties. For the other scope items, labor and workmanship carry a one-year warranty. Equipment warranties vary by manufacturer and will be included in post construction O&M documentation.

Energy Conservation Measures

Lighting Upgrades- General

During the IGA, McClure Company surveyed all 96 sites within the (12) Forest Districts and (2) State Park Regions, totaling over 19,500 fixtures. The surveys conducted in June 2019, revealed a variety of lighting technologies ranging from the inefficient incandescent to a more energy efficient T8 fluorescent lamp and ballast. Of the 19,500 fixtures recorded in our survey, approximately 1,049 fixtures are excluded primarily due to their present energy efficiency or lack of a more cost-effective energy efficient replacement source that would provide any significant gain in performance. The excluded fixtures may consist of, but not limited to, LED fixtures, exterior wall packs, recessed can fixtures, vanity fixtures, stairwell fixtures, and post top lighting.

Most fixtures overall are in good serviceable condition and are well maintained with minimal lamp or ballast outages. Survey notes have been recorded for current lamp burn outs or inoperable fixtures for M&V purposes. Based on existing fixture condition most fixtures will be addressed with an energy saving retrofit consisting of a reduced wattage, self-ballasted LED. The existing fluorescent ballast will be removed from service, and fixture re-wired to provide direct voltage to the tombstones. In designated areas a total of 2,202 new fixtures have been proposed to replace any fixtures in poor condition or to improve on the energy savings performance. Design consideration to standardize the lamp or fixture type, installation method, material or manufacturer, and necessary light levels for areas of installation have all been included in the design. Select mockups of similar spaces may be included at DCNR discretion and with approval by McClure based on space type and not by site location.

See Appendix 3 Lighting Line by Lines for detailed scope related to each site with recommendations by building.

Labor and workmanship carry a one-year warranty. Manufacturer warranty varies by application and lamp/fixture type. Typical LED warranties, both lamp and fixture, range from 5 to 10 years. Manufacturer warranties will be provided as part of the post project O&M manuals. Warranties will commence upon component installation and beneficial use.

Building Envelope Improvements- General

McClure Company is proposing to reduce the amount of infiltration air and increase critical insulation areas for 77 of the listed sites. Infiltration can be defined as unregulated outside air entering a building unintentionally. This air must be treated (heated or cooled) by the building's heating or cooling system to maintain acceptable indoor temperatures. Even the smallest cracks / penetrations can have a significant impact on the annual heating and cooling energy consumption.

Common savings areas include door weather stripping, air sealing roof wall interfaces, and air sealing interior to exterior penetrations. Specific scope quantities are found within each site's details below.

Labor and workmanship carry a one-year warranty.

Cabin HVAC

McClure Company is proposing to provide cooling for the (45) typical cabins throughout Region 1 & 3. This includes (7) at Black Moshannon, (10) at Hills Creek, (10) at Gifford Pinchot, (10) at Prince Gallitzin, and (8) at Canoe Creek. A wall-mounted, ductless split system heat pump will be installed in the common area for each cabin capable of providing heating and cooling. The associated condensing unit will be installed on grade outside the cabin. The existing electric resistance heat will be replaced, in kind, with new electric heat in the same location. It will operate as supplemental heat. A new programmable thermostat will be installed with the system to sequence the staged heat.

Cottage/Yurt Heating

The existing cottages are served by electric baseboard heating or wall-mounted, electric unit heaters. McClure Company is proposing to replace the existing electric resistance heat, in kind, with new electric heat in the same location for (36) typical cottages throughout Region 1 & 3. This includes (4) at Bald Eagle, (2) at Black Moshannon, (3) at Chapman, (3) at Hills Creek, (4) at Poe Valley, (3) at RB Winter, (3) at Codorus, (3) at Gifford Pinchot, (5) at Prince Gallitzin, (3) at Shawnee, and (3) at Little Pine.

The existing yurts are also served by electric resistance heating. McClure Company is proposing to replace the existing electric heat, in kind, with new electric heat in the same location for (14) typical yurts throughout Region 1 & 3. This includes (2) at Bald Eagle, (2) at Hills Creek, (2) at Chapman, (2) at Little Pine, (2) at Codorus, (2) at Gifford Pinchot, and (2) at Shawnee.

Michaux Forest District #1

Work within the Michaux Forest District focuses on upgrades to the Resource Management Center (RMC). General measures include lighting upgrades and building envelope improvements as detailed above. Approximately 385 total lighting retrofits or replacements are included, along with weatherstripping of (12) doors, air sealing of 150 LF of corrugated panels in the Mechanics Garage and insulating approximately 672 SF of attic in the Woodshop.

The existing office is served by a 300-MBH natural gas-fired, hot water boiler from 1972 which provides hot water throughout the building via (5) inline zone pumps. Additionally, there are (3) ducted air conditioning units located in the attic. The building has issues with uneven heating which causes comfort complaints. McClure proposes to replace the old boiler with a new natural gas-fired boiler of similar capacity. The (5) inline, hot water zone pumps shall be replaced, in kind, as well. The oldest existing AC unit in the attic shall be replaced with a new unit in the same location. The other (2) existing attic units shall remain. Additional controls shall be provided to better integrate the temperature control of the attic units and hot water baseboard zone heat.

In the Maintenance Building the existing natural gas-fired furnace only serves one garage bay and would be undersized to provide heating for the other bays. McClure proposes to replace the existing natural gas-fired furnace with a larger natural gas fired furnace to serve the additional Maintenance Building bays. The existing ductwork shall be reconfigured and extended to the additional bays.

FFP Black Moshannon Tanker

Work at the Black Moshannon Tanker site is limited to lighting upgrades. Approximately (9) fixtures are scheduled for retrofits or replacements.

Buchanan Forest District #2

Work within the Buchanan Forest District focuses primarily on the Headquarter Buildings (HQ) at Bear Valley and Sideling Hill. No work is proposed for Chaneyville. General measures include lighting upgrades and building envelope improvements as detailed above. Approximately 189 total lighting retrofits or replacements are included (83 at Bear Valley and 106 at Sideling Hill).

At Sideling Hill, (1) attic hatch will be weather-stripped, along with installation of approximately 3,770 SF of insulation above the ceiling. At Bear Valley, (2) pulldown stair access will be weather-stripped.

The Bear Valley HQ was built in 2013 and is served by a dual fuel wood/oil furnace. The building has issues with air stratification. McClure proposes to modify the existing supply ductwork to discharge lower to the occupied space in order to improve air distribution. Additionally, (4) new supplemental electric unit heaters shall be provided at each corner of the building to improve comfort in the space.

The limited work at the RMC surrounds installation of an electric vehicle charging station. The station will be similar in design to others installed by DCNR. McClure is proposing to install (4) charging stations on (2) pedestals, interconnecting to the existing building electrical system. Stations are proposed to be located within 75' of the existing building.

For this scope of work McClure has assumed the following:

- Location of charging station to be within 75' of the existing building
- No service upgrades or modifications are required for the charging stations
- No modifications or expansions of the existing parking area is required

Tuscarora Forest District #3

Work within the Tuscarora Forest District focuses on upgrades to the Resource Management Center (RMC) and Bryner Headquarters (HQ) with only general measures at East Licking Creek HQ. General measures include lighting upgrades and building envelope improvements as detailed above. Approximately 423 total lighting retrofits or replacements are included (302 at RMC, 86 at Bryner HQ, and 35 at East Licking Creek HQ).

At the RMC, approximately (29) doors will be weather-stripped or receive new sweeps, including (2) overhead doors, and (47) window perimeters will be air sealed. For Bryner HQ, (28) doors will be weather-stripped or receive new sweeps, including (5) overhead doors. At East Licking Creek HQ, approximately (9) doors will be weather-stripped or receive new sweeps, including (1) overhead door, as well as sealing gaps around existing window air conditioner and air sealing 124 LF of roof/wall interface.

The RMC is served by (5) existing geothermal heat pumps installed in 2001. The equipment is approaching the end of its service life, and therefore recommended for replacement. McClure proposes to provide (5) new geothermal heat pumps to replace the existing units, in kind.

Also, at the RMC, McClure is proposing to replace (15) single and (1) double window units, double hung type.

At Bryner HQ, new space thermostats and garage door sensors shall be provided to better control heating system during winter door operation.

Rothrock Forest District #5

Work within the Rothrock Forest District focuses on upgrades to the Resource Management Center (RMC) and general measures at the District's Headquarter (HQ) buildings. General measures include lighting upgrades and building envelope improvements as detailed above. Approximately 406 total lighting retrofits or replacements are included (123 at RMC, 43 at Greenwood HQ, 72 at Stony Point HQ, 48 at Trough Creek HQ, and 120 at Whipple Dam HQ).

At the RMC, (1) pulldown stair access will be weather-stripped, along with 3,100 SF of sheathing truss bottoms. For Greenwood HQ, (1) attic hatch will be weather-stripped, along with air sealing 630 LF of corrugated panels. At Stony Point HQ, (3) doors and (2) attic hatches will be weather-stripped, along with air sealing 400 LF of corrugated panels and caulking 750 LF of plywood joints. For Trough Creek HQ, (2) doors and (1) attic hatch will be weather-stripped, along with air sealing 504 LF of corrugated panels. At Whipple Dam HQ, (5) doors and (1) attic hatch will be weather-stripped, along with insulating approximately 3,690 SF of attic, sealing 104 LF of band joist, and caulking 1,600 LF of plywood joints

The RMC was renovated in 2006 with a geothermal heat pump system. McClure proposes to entirely re-balance the air and waterside of the existing mechanical systems to ensure that they are working as designed. The existing control system is antiquated, and the control line has been discontinued making product replacement/repair difficult and expensive. McClure proposes to provide a complete replacement of the existing controls with a new ATC control system. The new controls shall be open protocol with a web-based graphical interface. Additionally, there is very limited heat in the front entrance restroom. McClure proposes to install a wall-mounted, electric heater to improve the comfort within the space.

As part of this scope McClure has included alternate pricing as an allowance for the replacement of the (5) heat pumps and energy recovery unit should it be determined during recommissioning that the units warrant replacement. Results of the recommissioning will be discussed with DCNR prior to executing the use of allowance funds.

Bald Eagle Forest District #7

Work within the Bald Eagle Forest District focuses on upgrades to both the Resource Management Center (RMC) and the District's Headquarter (HQ) buildings. General measures include lighting upgrades and building envelope improvements as detailed above. Approximately 540 total lighting retrofits or replacements are included (321 at RMC, 76 at Eastville HQ, 61 at Hickernell HQ, 62 at NLV HQ, and 20 at Troxelville HQ).

At the RMC, (9) doors will be weather-stripped, along with sealing 220 LF of window box sills. Additionally, (2) overhead doors will be replaced. For Hickernell HQ, (6) doors will be weather stripped, along with 2,400 SF of air seal and insulation for the attic. Additionally, (2) overhead doors will be replaced. At Eastville HQ, (5) doors will be weather-stripped, along

with 1,800 SF of air seal and insulation for the attic. Additionally, (3) overhead doors will be replaced. For NLV HQ, (6) doors will be weather-stripped, along with 2,400 SF of air seal and insulation for the attic. At Troxelville HQ, (9) doors will be weather-stripped, along with caulking (5) window frames. Additionally, (5) overhead doors will be replaced.

At the RMC, an existing unit heater is in need of replacement due to equipment failure. This unit will be replaced in kind.

At the Maintenance building for Eastville HQ, the firebox on the existing 140 MBH dual fuel, wood/oil furnace is starting to wear. McClure proposes to provide a new propane-fired furnace in the same location. The existing above ground oil tank shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank by DCNR. At the Eastville residence the existing 140 MBH dual fuel, wood/oil furnace is recommended for replacement. McClure proposes to provide a new propane-fired furnace in the same location. The existing oil tank located in the basement shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank by DCNR.

At the Eastville and Hickernell residences, the existing windows are scheduled for replacement as part of this proposal. The current cost is listed as a not to exceed allowance based on replacement of approximately (22) windows at Eastville and (21) at Hickernell. Final costs will be provided during preconstruction from a residential contractor. Any non-utilized funding from the allowance will become part of the project contingency.

Moshannon Forest District #9

Work within the Moshannon Forest District focuses on upgrades to the Black Moshannon Headquarters (HQ) with general measures at other District sites. General measures include lighting upgrades and building envelope improvements as detailed above. Approximately 914 total lighting retrofits or replacements are included (572 at RMC, 213 at Black Moshannon HQ, 87 at Dague Forest HQ, and 42 at Quehanna HQ).

At the RMC, (5) doors will be weather-stripped, along with sealing 365 LF of window box sills and air sealing/insulating 3,230 SF of attic. Additionally, (2) entry doors will be replaced. For Black Moshannon HQ, (20) doors will be weather-stripped. At Quehanna HQ, (21) doors will be weather-stripped, along with air sealing and insulating 6,200 SF of attic. For Dague Forest HQ, (6) doors will be weather-stripped, along with air sealing and insulating 3,600 SF of attic.

At the Black Moshannon HQ, the existing 198 MBH propane-fired, hot water boiler was installed in 1997 and is poor condition. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity.

Sproul Forest District #10

Work within the Sproul Forest District focuses on upgrades at the Resource Management Center (RMC) and Cooks Run Headquarters (HQ), with general measures at other District sites. General measures include lighting upgrades and building envelope improvements as detailed above. Approximately 382 total lighting retrofits or replacements are included (196 at RMC, 33 at Snow Shoe HQ, 92 at Cooks Run HQ, 16 at Hyner HQ, 26 at Shinetown HQ, and 19 at the ATV Pole Barn).

At the RMC, (34) doors will be weather-stripped, along with installing (2) new exterior doors and sealing 240 LF of window perimeter. At Cooks Run HQ, (23) doors will be weather-stripped. At Hyner HQ, (7) doors will be weather-stripped. For Snow Shoe HQ, (11) doors will be weather-stripped.

At the RMC Maintenance, the existing 109 MBH oil-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The (2) existing oil tanks located in the garage shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank by DCNR. The older part of the office is served by an existing 156 MBH oil-fired furnace that was installed in 1999. The basement storage area requires additional heat for comfort. Also, there a lower level office area that is served by an existing floor-mounted unit ventilator with condensing unit outside on grade. McClure proposes to replace the existing furnace with a new propane-fired boiler of the same capacity. A new electric unit heater shall be provided in the basement storage area. The lower level office unit ventilator shall be replaced, in kind, with a unit in the same location. The existing oil tank located on grade shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank by DCNR. The Maintenance building is served by a 12-gallon electric tank domestic water heater. McClure proposes to replace the existing domestic hot water storage type unit with a new electric tankless, instantaneous unit of the same capacity. The office is served by a 50-gallon electric tank domestic water heater. McClure

propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity.

At the Cooks Run HQ Building the existing 200 MBH oil-fired, hot water boiler is in need of replacement. Additionally, there are (5) hot water zone pumps that are recommended for replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The inline, hot water zone pumps shall be replaced in kind. The (2) existing oil tanks located indoors shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank by DCNR. At the Cooks Run HQ residence the existing 125 MBH oil-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The existing oil tanks located in the basement shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank by DCNR.

Tiadaghton Forest District #12

Work within the Tiadaghton Forest District focuses on upgrades at the Resource Management Center (RMC) and all Headquarters (HQ) buildings, including general measures at all District sites. General measures include lighting upgrades and building envelope improvements as detailed above. Approximately 512 total lighting retrofits or replacements are included.

At the RMC, (25) doors will be weather-stripped. At Jersey Mills HQ, (16) doors will be weather-stripped, along with air sealing and insulating approximately 2,280 SF of attic. Additionally, (1) overhead door will be replaced. At Rauchtown HQ, (33) doors will be weather-stripped. Additionally, (4) overhead doors will be replaced. For Waterville HQ, (19) doors will be weather-stripped. Additionally, (8) overhead doors will be replaced.

At the RMC, the existing automation system is a legacy Automated Logic (ALC) system with mechanical equipment that has Johnson Controls factory controls. There is limited ability to vary any of the equipment settings, programming, etc. McClure proposes to remove the existing control systems and provide an upgraded open protocol, web-based automation system as part of a controls upgrade/recommissioning process.

At Rauchtown HQ the existing oil-fired furnace is over 25 years old and in need of replacement. McClure proposes to replace the existing furnace with a new propane-fired furnace of the same capacity. The existing oil tanks located indoors shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank by DCNR.

At Waterville HQ, the New Maintenance Building is served by an oil-fired boiler which provides hot water to a makeup air unit. Due to noise complaints from the makeup air unit, McClure proposes to provide (3) new hot water unit heaters to operate as the primary heat source. The existing makeup air unit will be controlled to only operate when a space carbon monoxide sensor requires.

The control system for Waterville HQ is tied to RMC building. The existing Automated Logic (ALC) control system is an extension of the RMC system and does not allow for local control. McClure proposes to remove the existing control system and provide new upgraded controls to match the new RMC controls. The new system will be provided with local control for setpoint adjustment. Garage door controls will be provided to disable heating when the doors are open.

At the District's Pump House Structure, the garage addition is served by (4) 4kW electric unit heaters and is having difficulty maintaining temperature. The rest of the garage is served by (3) propane-fired unit heaters. McClure proposes to replace the (3) existing electric unit heaters with (3) propane-fired unit heaters to better maintain temperature within the building addition. The propane piping shall be extended from the existing propane unit heaters in the building.

Elk Forest District #13

Work within the Elk Forest District focuses on general measures only at the Resource Management Center (RMC) and Headquarters (HQ) buildings. General measures include lighting upgrades and building envelope improvements as detailed above. Approximately 442 total lighting retrofits or replacements are included.

At the RMC, (20) doors will be weather-stripped. At Brooks Run HQ, (13) doors will be weather-stripped along with sealing gaps around window air conditioners. At Sizerville HQ, (20) doors will be weather-stripped. For Snow Shoe HQ, (11) doors will be weather-stripped.

Susquehannock Forest District #15

Work within the Susquehannock Forest District focuses on upgrades at the Resource Management Center (RMC) with general measures at Headquarter (HQ) sites. General measures include lighting upgrades and building envelope improvements as detailed above. Approximately 452 total lighting retrofits or replacements are included (223 at RMC, 76 at Bark Shanty HQ, 94 at Cross Forks HQ, and 59 at Lyman Run HQ).

At the RMC, (13) doors will be weather-stripped along with air sealing and insulating 5,600 SF of attic. Additionally (3) overhead doors will be replaced. At Cross Forks HQ, (8) doors will be weather-stripped along with air sealing and insulating 3,486 SF of attic. Additionally, (5) overhead doors will be replaced. At Lyman Run HQ, (6) doors will be weather-stripped along with air sealing and insulating 3,000 SF of attic. Additionally, (4) overhead doors will be replaced. For Bark Shanty HQ, (8) doors will be weather-stripped along with air sealing and insulating 3,600 SF of attic. Additionally, (4) overhead doors will be replaced.

At the RMC Maintenance building the existing natural gas boiler is in need of replacement. McClure proposes to replace the existing boiler, in kind, with a new natural gas boiler of the same capacity. The RMC Office is served by 138-MBH and 92-MBH natural gas boilers from 1998 and 2000 in poor condition. Additionally, there are (3) HW/DX split system air handling units (AHU) also in poor condition. McClure proposes to replace the existing boilers, in kind, with new natural gas boilers of the same capacity. The (3) AHUs shall be replaced, in kind, with new HW/DX units in the same location. Domestic hot water at the office is served by a 40-gallon electric tank domestic water heater. McClure proposes to replace the existing domestic hot water storage type unit with a new gas-fired tankless, instantaneous unit of the same capacity.

Tioga Forest District #16

Work within the Tioga Forest District focuses on general measures only at the Resource Management Center (RMC) and Headquarters (HQ) buildings. General measures include lighting upgrades and building envelope improvements as detailed above. Approximately 358 total lighting retrofits or replacements are included.

At the RMC, (13) doors will be weather-stripped along with 1 attic/roof hatch. At Ansonia HQ, (6) doors will be weather-stripped. At Armenia HQ, (10) doors will be weather-stripped. For Darling Run Contact Station, (2) doors will be weather-stripped.

Mira Lloyd Dock RCC Forest District #21 "Penn Nursery"

Work at the Mira Lloyd Dock RCC or Penn Nursery focuses on general measures and improvements to the cold storage, controls system for the main office, and boiler upgrades at the table shop. General measures include lighting upgrades and building envelope improvements as detailed above. Approximately 456 total lighting retrofits or replacements are included.

Approximately (55) doors will be weather-stripped along with air sealing 200 LF of roof/wall interface, installing 3,750 SF of insulation, and air sealing (50) window perimeters. Additionally, the seed cooler located in the Seed Extraction building will be air sealed to create an air resistant boundary within the constructed cooler. A new commercial cooler door will be installed to aid in mitigating infiltration and exfiltration of conditioned air.

The Main Office is currently conditioned by a geothermal system. McClure is recommending a recommissioning effort and upgrades to the system controls. The existing control system is a legacy Johnson Controls system which still operates adequately but does not offer a user-friendly control interface. McClure proposes to provide a more user-friendly operator's station with upgraded graphics package for easy access and review of zone temperatures, setpoints, etc. Additionally, Johnson Controls shall recommission the existing to remain controllers to ensure proper operation of the automation system.

As part of this scope McClure has included alternate pricing as an allowance for the replacement of the energy recovery unit should it be determined during recommissioning to warrant replacement. Results of the recommissioning will be discussed with DCNR prior to executing the use of allowance funds.

The Table Shop is heated by an existing wood-fired furnace. McClure proposes to replace the existing furnace with a new wood-fired gasification furnace in the same location. A new makeup air door louver shall be provided at the furnace closet to provide adequate ventilation and minimize pressure issues currently experienced in the facility.

Park Region 1 Office (Included with Elk Forest District #13)

The scope of work for the Region 1 Office is included with the Elk Forest District #13 scope, as both entities utilize the same building.

Bald Eagle State Park

Work within Bald Eagle State Park focuses on general measures, fuel conversions for HVAC equipment, and HVAC upgrades at the Nature Inn, (4) Cottages, and (2) Yurts. Additionally, recommissioning and equipment replacement is proposed for the Nature Inn. Approximately 583 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Beach house- Weather-strip (10) doors
- Environmental Learning Center- Weather-strip (5) doors
- EQ Building- Weather-strip (1) door
- Maintenance/Park Office- Weather-strip (7) doors, air seal window air conditioners
- Marina- Weather-strip (3) doors
- Nature Inn- Weather-strip (24) doors
- Oak Bath House- Weather-strip (3) doors
- Park Residence- Weather-strip (3) doors
- Pump Station- Weather-strip (2) doors
- Wastewater Treatment- Weather-strip (3) doors
- Storage- Weather-strip (6) doors
- Sycamore Bath House- Weather-strip (3) doors
- Well House- Weather-strip (2) doors

The Nature Inn is served by a water-cooled, variable refrigerant flow (VRF) system. The system serving the second-floor guest rooms are experiencing temperature issues during peak cooling demand. Upon evaluating the systems, it was determined that the VRF fan coil units are undersized to meet peak cooling demand. McClure proposes to replace the (8) fan coil units serving the second-floor guest rooms with larger units to improve the comfort of spaces during the summer cooling season. The existing VRF refrigerant piping serving these units shall be reused. The second-floor system shall be rebalanced to ensure proper operation.

The Maintenance building is served by an existing 113 MBH oil-fired, hot water boiler and a DX split system unit. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The existing split system shall be replaced with a new DX/propane-fired split system in the same location. The existing oil tank located underground shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

Bendigo State Park

Work within Bendigo State Park focuses on general measures only. Approximately 120 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Maintenance Building- Weather-strip (5) doors

- Residence- Weather-strip (4) doors, air seal 250 LF of window perimeter and 160 LF of box sills
- Pool Building- Weather-strip (1) door

Black Moshannon State Park

Work within Black Moshannon State Park focuses on general measures and HVAC upgrades at the Cabins and Cottages. Approximately 419 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Beach house- Weather-strip (6) doors
- Cabins- Weather-strip (24) doors
- Comfort Station- Weather-strip (4) doors
- Food/Concession- Weather-strip (6) doors, air seal various penetrations
- Shower houses- Weather-strip (8) doors
- Maintenance Building- Weather-strip (9) doors, caulk 300 LF of exterior gap, air seal 80 LF of window perimeters
- Park Office- Weather-strip (4) doors
- Wastewater Treatment- Weather-strip (3) doors
- Water Treatment- Weather-strip (3) doors

The (1) existing restroom is served by a propane-fired domestic water heater tank. Additionally, there is a small electric domestic water heater tank that serves the year-round winter restroom. McClure proposes to replace the existing electric water heater tank with a new electric, tankless instantaneous unit in the same location. The existing propane-fired unit shall remain.

At Cabin #13, DCNR has issues with the existing propane-fired boiler. McClure proposes to replace the existing propane-fired boiler with a new propane-fired boiler in the same location. The existing electric domestic water heater tank shall be replaced with a propane-fired, tankless instantaneous water heater. A new wall-mounted, ductless split system heat pump will be installed in the common area for the cabin to provide heating and cooling.

At Cabin #14, DCNR would like to replace the wood fireplace with a gas option. McClure proposes to install a propane-fired, ventless fireplace insert. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR. A new wall-mounted, ductless split system heat pump will be installed in the common area for the cabin to provide heating and cooling.

The other (5) existing cabins are served by electric resistance heating. McClure proposes to provide the typical Cabin heat pump and electrical resistance upgrades outlined above in the report.

The Park Office is served by a 150-MBH propane-fired, hot water boiler and (4) packaged terminal air conditioners (PTAC). The building addition is served by a 59-MBH propane/DX furnace. McClure proposes to replace the existing propane-fired boiler, in kind, with a new propane-fired boiler of the same capacity. The (4) existing PTAC units shall be replaced, in kind, with new PTACs in the same location. Additionally, the existing DX/propane-fired furnace shall be replaced with a new unit.

Chapman State Park

Work within Chapman State Park focuses on general measures and HVAC upgrades at the (3) Cottages and (2) Yurts. Approximately 359 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Park Office- Weather-strip (3) doors, air seal and insulate 1,000 SF of attic, air seal 140 LF of box sills
- Maintenance Building- Weather-strip (7) doors, air seal and insulate 3,200 SF of attic
- Water Treatment- Weather-strip (2) doors, air seal and insulate 400 SF of attic
- Restrooms- Weather-strip (16) doors
- Cottages- Weather-strip (3) doors
- Beach House- Weather-strip (6) doors

- Environmental Learning Center- Weather-strip (2) doors, air seal and insulate 500 SF of attic, air seal 500 SF of crawl space

The Park Office is served by a 112-MBH propane-fired boiler and (4) existing PTAC units that are in need of replacement. McClure proposes to replace the propane-fired boiler, in kind, with a new propane-fired boiler of the same capacity. The (4) existing PTAC units shall be replaced, in kind, with new PTACs in the same location.

At the Maintenance building the existing natural gas-fired boiler provides the garage with hot water radiant floor heat and provides hot water to an AHU serving the office area. There are comfort issues in the office area during peak heating demand. McClure proposes to install a natural gas-fired unit heater in the garage bay to provide supplemental heating. Also, additional controls shall be provided on the hot water piping to more properly balance the hot water supply between the office and garage during peak heating demand. The natural gas fired, HW boiler shall be existing to remain. The building is served by a 20-year-old, propane-fired 75-gallon tank water heater. McClure proposes to replace the existing domestic water heater with a propane-fired, tankless instantaneous water heater of the same capacity.

The Environmental Learning Center is served by a 51-MBH electric forced air furnace and a through-the-wall AC unit that are in need of replacement. McClure proposes to replace the existing furnace and wall AC unit with a new DX/propane-fired furnace. A new condensing unit shall be installed on pavers on grade. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR. The wall opening for the wall AC unit shall be properly sealed.

Cherry Springs State Park

Work within Cherry Springs State Park focuses on lighting upgrades only. Approximately (29) total lighting retrofits or replacements are included.

Denton Hill State Park

Work within Denton Hill State Park focuses on lighting upgrades only. Approximately 223 total lighting retrofits or replacements are included.

Elk County Visitor Center

Work within the Elk County Visitor Center focuses on general measures and HVAC upgrades at the Homestead. Approximately 249 total lighting retrofits or replacements are included. At the facility (23) doors will be weather-stripped, (52) window perimeters will be air sealed, along with 30 LF of wall joints.

At the Elk County Homestead, the existing 140 MBH propane-fired furnace is failing and in need of replacement. McClure proposes to replace the existing furnace, in kind, with a new propane-fired furnace of the same capacity.

Hills Creek State Park

Work within Hills Creek State Park focuses on general measures, fuel conversions for domestic hot water systems and HVAC equipment, and HVAC upgrades at (10) Cabins, (3) Cottages, (2) Yurts. Approximately 342 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Shower houses- Weather-strip (14) doors
- Well houses- Weather-strip (2) doors, air seal 64 LF of roof/wall interface
- Cabins- Weather-strip (10) doors, air seal and insulate 4,000 SF
- Cottages- Weather-strip (3) doors
- Nature Center- Weather-strip (3) doors, air seal window air conditioner
- Maintenance Building- Weather-strip (4) doors, air seal and insulate 1,800 SF, air seal (3) window perimeters, air seal window air conditioner
- Park Office- Weather-strip (4) doors, air seal and insulate 1,000 SF, air seal window air conditioners
- Park Residence- Weather-strip (5) doors, air seal window air conditioner

- Wastewater Treatment- Weather-strip (6) doors

The (3) existing shower houses are each served by (2) 75-gallon propane-fired tank water heaters. McClure proposes to replace the existing domestic hot water storage type units with new propane-fired, tankless instantaneous units of the same capacity.

At the Park Residence the existing 85 MBH propane-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The residence is served by a propane-fire, 40-gallon tank domestic water heater. McClure propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity.

Hyner Run State Park

Work within Hyner Run State Park focuses on general measures and domestic hot water system upgrades to a shower house. Approximately 141 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Lodge- Weather-strip (2) doors and (1) attic/roof hatch
- Maintenance Building- Weather-strip (6) doors
- Park Office- Weather-strip (2) doors
- Pump House- Weather-strip (1) door
- Shower house- Weather-strip (6) doors

The (1) existing shower house is served by (2) 75-gallon propane-fired tank water heaters and an instantaneous unit. McClure proposes to replace the existing domestic hot water storage type units with new propane-fired, tankless instantaneous units of the same capacity. The existing instantaneous unit shall remain.

Kettle Creek State Park

Work within Kettle Creek State Park focuses on general measures and domestic hot water system upgrades to a shower house. Approximately 209 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Office- Weather-strip (2) doors, air seal 550 LF of box sills and exterior seams, air seal and insulate 4,000 SF of attic, install 2,750 SF of air seal barrier in crawlspace
- Maintenance Shop- Weather-strip (1) door, air seal 240 LF of exterior seams
- Water Treatment- Weather-strip (2) doors, air seal 200 LF of exterior seams
- Campground Buildings- Weather-strip (2) doors, air seal and insulate 200 SF of attic, air seal 750 LF of exterior seams
- Wastewater Treatment- Weather-strip (1) door
- Restroom- Weather-strip (4) doors

The (1) existing shower house is served by a propane-fired tank water heater in poor condition. McClure proposes to replace the existing domestic hot water storage type unit with new propane-fired, tankless instantaneous unit of the same capacity.

Kinzua Bridge State Park

Work within Kinzua Bridge State Park focuses on general measures only. Approximately 308 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Office/Maintenance Buildings- Weather-strip (15) doors

Leonard Harrison State Park

Work within Leonard Harrison State Park focuses on general measures, as well as fuel conversions for domestic hot water systems and HVAC equipment. Approximately 157 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Shower houses- Weather-strip (4) doors
- Maintenance Building- Weather-strip (8) doors
- Park Office-Weather-strip (2) doors
- Visitor’s Center- Weather-strip (6) doors

The (1) existing shower house is served by (2) 119-gallon electric tank water heaters. McClure proposes to replace the existing domestic hot water storage type units with new propane-fired, tankless instantaneous units of the same capacity. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

At the Park Office the existing 119 MBH oil-fired/DX split system air handling unit is in need of replacement. McClure proposes to replace the existing AHU with a new propane-fired/DX unit of the same capacity. The existing underground oil tank shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

Little Pine State Park

Work within Little Pine State Park focuses on general measures, domestic hot water system upgrades to a shower house, and HVAC upgrades at the (3) Cottages and (2) Yurts. Approximately 325 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Cottages- Weather-strip (3) doors
- Comfort Stations- Weather-strip (14) doors
- Maintenance Building- Weather-strip (7) doors, air seal around window air conditions
- Park Office- Weather-strip (5) doors
- Well House- Weather-strip (2) doors

The (1) existing shower house is served by a 100-gallon propane-fired tank water heater. McClure proposes to replace the existing domestic hot water storage type unit with new propane-fired, tankless instantaneous unit of the same capacity.

At the Park Office, there are significant comfort issues surrounding areas served by (3) existing heat pump units. McClure proposes to replace the existing heat pumps with (3) propane-fired/DX split system air handling units in the same location. The propane piping shall connect to the existing propane line at the building.

Lyman Run State Park

Work within Lyman Run State Park focuses on general measures only. Approximately 186 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Park Office - Weather-strip (2) doors, air seal and insulate 1,500 SF of attic, air seal 300 LF of exterior gaps and 160 LF of box sills
- Pump House- Weather-strip (2) doors, insulate 800 SF of walls, air seal and insulate 600 SF of attic
- Maintenance Building- Weather-strip (4) doors, air seal and insulate 2,200 SF of attic
- Truck Garage- Weather-strip (3) doors, air seal and insulate 1,000 SF of attic
- Shower houses- Weather-strip (9) doors
- Park Residence- Weather-strip (2) doors, air seal and insulate 2,500 SF of attic, air seal 220 LF of box sills

Mount Pisgah State Park

Work within Mount Pisgah State Park focuses on general measures, as well as fuel conversions for domestic hot water systems and HVAC equipment. Additionally, there is an allowance for a new on-lot wastewater system to replace the aging wastewater treatment plant. Approximately (190) total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements.

- Lifeguard Station- Weather-strip (2) doors, air seal around window air conditioner
- Maintenance Building- Weather-strip (9) doors, air seal and insulate 2,300 SF, air seal around window air conditioner
- Park Manager's Residence- Weather-strip (4) doors
- Nature Center- Weather-strip (1) door
- Park Office- Weather-strip (4) doors, air seal and insulate 1,125 SF
- Pool Building- Weather-strip (3) doors
- Pump House- Weather-strip (1) door

The (1) existing shower house is served by a 32-gallon oil-fired tank water heater. McClure proposes to replace the existing domestic hot water storage type unit with new propane-fired, tankless instantaneous unit of the same capacity. The existing above ground oil tank in the water heater room shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

At the Maintenance building, the existing 292 MBH oil-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The existing oil tank located above ground shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

The Park Office is served by a 3-ton DX/oil-fired split system air handling unit. McClure proposes to replace the existing unit with a propane-fired/DX split system of the same capacity. The existing oil tank located underground shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

Existing wastewater from select buildings within the Park, are conveyed to the Wastewater Treatment Plant (WWTP). The Park has generated minimal flows given the limited connections and no outside connections to municipalities. The largest flows are during the summer and tied to the pool use. Current infiltration of ground water and runoff have artificially increased the treatment flows at the facility. Infiltration is likely from failing piping networks and basins within the conveyance infrastructure.

To address the infiltration issue and provide an on-lot style system, McClure is proposing a two part solution, with the first scope addressing the infiltration and treatment of solid wastes while the second scope address the treatment of effluent for discharge, ultimately removing the WWTP from service. The initial scope of work includes installation of septic tanks at select locations while also eliminating select facilities from the system, such as the Lakeside Restroom. The removed facilities would be converted to a traditional pre-cast vault style restroom with CXT building. Buildings currently slated for connection to the new on lot system include: Park Office, Pool, Environmental Learning Center, and Maintenance Shop. The pool area would also receive a Class 5 Injection well to properly treat the waste. In addition to the septic tanks, the existing conveyance network would be inspected, cleaned, and lined with new HDPE piping to eliminate infiltration. The second scope adds the necessary effluent system at or near the existing WWTP to effectively treat the liquid waste after the septic tanks. This includes new dose tanks, pump stations, and dispersion area. Also, included would be decommissioning of the WWTP.

The wastewater scope is currently listed as an allowance, as the final scope and design cannot be completed without incurring significant costs in site surveys and tests to determine the necessary dispersal area, treatment, and required permitting/review. Results of the surveys and final cost will be reviewed with DCNR prior to moving forward, and any non-utilized funds will be applied to project contingency.

Estimated timelines from date of acceptance of the IGA are:

- 4-6 weeks for site inspections, pre-review, testing concluding with final scope and pricing
- 3-6 months of final engineering, reviews, permitting concluding with construction mobilization and installation

Ole Bull State Park

Work within Ole Bull State Park focuses on general measures, domestic hot water system upgrades to a shower house, HVAC fuel conversions, and HVAC upgrades at the Lodge. Approximately 254 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Park Residence- Weather-strip (3) doors, air seal 200 LF of box sills, 500 SF of knee wall, and 500 LF of exterior gaps, install 260 SF of poly for crawlspace
- Park Office- Weather-strip (2) doors, air seal and insulate 1,300 SF of attic, air seal 130 LF of box sills and 240 LF of exterior gaps, install 1,300 SF of poly for crawlspace
- Cottages- Weather-strip (2) doors, air seal 170 LF of box sills and 500 LF of exterior gaps
- Campground Restrooms- Weather-strip (10) doors, air seal 300 LF of exterior gaps
- Maintenance Building- Weather-strip (3) doors, air seal 300 LF of exterior gaps

There are (2) existing shower houses. One of the shower houses is served by (2) 119-gallon electric tank water heaters. McClure proposes to replace the existing domestic hot water storage type units with new propane-fired, tankless instantaneous units of the same capacity. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR. The other shower house is served by a 119-gallon propane-fired tank water heater and a 40-gallon propane-fired tank water heater. McClure proposes to replace the existing domestic hot water storage type unit with new propane-fired, tankless instantaneous units of the same capacity.

At the Park Office the existing propane-fired/DX split system air handling unit is in need of replacement. McClure proposes to replace the existing unit, in kind, with a new propane-fired/DX split system air handling unit in the same location.

The Ole Bull Lodge is a 2-story building served by a propane boiler installed in 2008. The boiler is in adequate condition and will not be replaced. Per DCNR's request, the Lodge will be upgraded with cooling throughout and provided with an associated condensing unit located on grade.

At the Park Residence the existing 133 MBH propane-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler, in kind, with a new propane-fired boiler of the same capacity.

Parker Dam State Park

Work within Parker Dam State Park focuses on lighting, HVAC improvements, and a fuel switch from site supplied natural gas to propane for select buildings. Approximately 597 total lighting retrofits or replacements are included.

At the Park Office there is very limited heat in the front entrance restroom. McClure proposes to install a wall-mounted, electric wall heater to improve the comfort within the space.

DCNR has experienced natural gas pressure issues at the park and would like to switch the fuel source of the cabins to propane. The natural gas branch piping to the cabins shall be isolated from the main. A propane tank farm shall be installed, and new underground piping shall be run to connect to the branch piping. The existing cabin heating equipment will be replaced with propane-fired equipment. This includes (16) unit heaters in the cabins, (14) unit heaters in the bathhouses, and (7) tankless domestic water heaters in the bathhouses. This does not include the existing gas ranges.

For the fuel switch scope above, McClure has assumed the following:

- Existing distribution piping to the cabins can be reused for the new fuel, propane
- Included in the scope is the construction of a propane tank farm
- Isolation of the existing piping loop is possible to allow for cutting, capping, and intersection of the natural gas line without additional work to the infrastructure
- All other buildings will remain on the existing natural gas network

Poe Paddy State Park

Work within Poe Paddy State Park focuses on lighting upgrades only. Approximately (14) total lighting retrofits or replacements are included.

Poe Valley State Park

Work within Poe Valley State Park focuses on general measures and HVAC upgrades for the (4) cottages. Approximately (79) total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Beach house- Weather-strip (7) single doors
- Cottages- Weather-strip (4) doors and air seal 800 SF of crawl space decking
- Pump House- Weather-strip (1) door and air seal approximately 100 LF of building exterior

Ravensburg State Park

Work within Ravensburg State Park focuses on lighting and domestic hot water system upgrades to a shower house. Approximately (23) total lighting retrofits or replacements are included.

The (1) existing shower houses is served by electric tank water heaters. McClure proposes to replace the existing domestic hot water storage type units with new propane-fired, tankless instantaneous units of the same capacity. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

Raymond B. Winter State Park

Work within Raymond B. Winter State Park focuses on general measures, domestic hot water system upgrades to a shower house, and HVAC upgrades for the (3) cottages. Approximately 455 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Shower house- Weather-strip (4) doors
- Cottages- Weather-strip (3) doors
- Environmental Learning Center- Weather-strip (2) doors, air seal 206 LF of window perimeters
- Comfort Station- Weather-strip (4) doors
- Restrooms- Weather-strip (4) doors
- Maintenance Building- Weather-strip (9) doors
- Park Office- Weather-strip (3) doors
- Pump house- Weather-strip (1) door
- Lodge- Weather-strip (4) doors

The (1) existing shower house is served by a 119-gallon electric tank water heater. McClure proposes to replace the existing domestic hot water storage type unit with a new propane-fired, tankless instantaneous unit of the same capacity. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

Reeds Gap State Park

Work within Reeds Gap State Park focuses on general measures only. Approximately 160 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Office- Air seal 3,410 SF of roof deck
- Garage- Weather-strip (2) doors
- Pool house- Weather-strip (2) doors
- Pump House- Weather-strip (1) door, air seal 100 SF
- Restrooms- Weather-strip (6) doors

- Park Residence- Air seal and insulate 3,000 SF of attic

Shikellamy State Park

Work within Shikellamy State Park focuses on general measures only. Approximately 177 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Comfort Station- Weather-strip (7) doors
- Maintenance Building- Weather-strip (4) doors
- Park Office/Maintenance- Weather-strip (10) doors

Simon B. Elliott State Park

Work within Simon B. Elliott State Park focuses on general measures only. Approximately (82) total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Cabins- Weather-strip (6) doors

Sinnemahoning State Park

Work within Sinnemahoning State Park focuses on general measures, HVAC improvements, and fuel conversions for shower houses and restrooms. Approximately 417 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Wildlife Center- Weather-strip (5) doors
- Maintenance Shop- Weather-strip (7) doors, air seal and insulate 1,600 SF of attic, air seal 590 LF of exterior gaps
- Brooks Run Cabin- Weather-strip (3) doors, air seal and insulate 800 SF of attic, air seal 120 LF of box sills and 300 LF of exterior gaps, install 120 SF of poly crawl space barrier
- Park Residence- Weather-strip (6) doors, air seal and insulate 3,300 SF of attic, air seal 70 LF of box sills and 500 LF of exterior gaps
- Weld Shop- Weather-strip (1) door, air seal and insulate 400 SF of attic
- Shower houses- Weather-strip (3) doors, air seal and insulate 400 SF of attic, air seal 50 LF of exterior gaps

The (1) existing shower house is served by a 50-gallon electric tank water heater. McClure proposes to replace the existing domestic hot water storage type unit with a new propane-fired, tankless instantaneous unit of the same capacity. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

The (6) existing year-round restrooms are served by electric tank domestic water heaters. For each restroom, McClure proposes to replace the existing electric tank water heater with a new electric, tankless instantaneous unit in the same location.

The Brooks Run Cabin is served by a 140 MBH propane-fired, hot water Peerless boiler in poor condition. McClure proposes to replace the existing unit, in kind, with a new propane-fired boiler of the same capacity. Additionally, the existing hot water zone valves will be replaced to improve the temperature control of the hot water baseboard. Per DCNR's request, the Cabin will also be upgraded with cooling throughout and provided with an associated condensing unit located on grade.

The Park Residence is served by a 100 MBH propane-fired/DX split system air handling unit (AHU) in poor condition. McClure proposes to replace the existing unit, in kind, with a new propane-fired/DX split system AHU of the same capacity. The residence is served by an electric, 50-gallon tank domestic water heater. McClure propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity.

The Maintenance building is served by a 125 MBH propane-fired, forced air furnace in poor condition. McClure proposes to replace the existing unit, in kind, with a new propane-fired furnace in the same location. New supply ductwork shall

extend from the unit across the garage to provide better air distribution. The building is served by an electric, 30-gallon tank domestic water heater. McClure propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity.

The Park Office/Visitor Venter is served by a geothermal system with (8) heat pumps throughout the building. The existing system has difficulty maintaining winter temperatures and much of the mechanical equipment and piping require replacement due to poor water quality. McClure proposes to replace the existing mechanical piping and existing heat pumps throughout the building. New distribution pumps and accessories shall be provided in the mechanical room. A new propane-fired domestic water heater shall be provided. The water heater shall provide supplemental heating to the geothermal loop via a new heat exchanger. All the geothermal wells shall be pressure tested. An allowance has been included for the installation of a fluid cooler should it be determined that the well field no longer operates correctly. The

Sizerville State Park

Work within Sizerville State Park focuses on general measures, HVAC improvements, and fuel conversions for shower houses. Approximately 208 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Office- Weather-strip (4) doors, air seal and insulate 1,100 SF of attic
- Environmental Building- Weather-strip (2) doors, air seal and insulate 1,400 SF of attic
- Filter Building- Weather-strip (3) doors
- Maintenance Shop- Weather-strip (2) doors, air seal and insulate 2,900 SF of attic, air seal 360 LF of exterior gaps
- Regional Maintenance Shop- Weather-strip (3) doors, air seal and insulate 4,000 SF of attic, air seal 400 LF of exterior gaps
- Restroom- Weather-strip (3) doors, air seal 150 LF of exterior gaps

The (1) existing shower house is served by (2) 75-gallon electric tank water heaters. McClure proposes to replace the existing domestic hot water storage type units with new propane-fired, tankless instantaneous units of the same capacity. New propane piping shall be provided from the units to the exterior for connection to propane tank provided by DCNR.

At Park Residence 1 the existing 130 MBH propane-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity.

At Park Residence 3 the existing 150 MBH propane-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity.

Park Region 3 Office

General measure work at the Park Region 3 Office is included within the scopes at Shawnee State Park. However, specific scope to this facility includes replacement of existing domestic hot water units.

The office is served by (4) small electric tank domestic water heaters. McClure proposes to replace the (4) existing electric domestic hot water tanks with electric, tankless instantaneous water heaters.

For this scope of work McClure has assumed:

- Electrical service to the existing tank style units is sufficient for the new tankless style units
- No upgrades to the electrical service
- Existing equipment is of sufficient capacity for current use and new equipment is sized to match

Big Spring State Forest Picnic Area

No scope of work is proposed for this site.

Blue Knob State Park

Work within Blue Knob State Park focuses on general measures, fuel conversions for domestic hot water systems at (2) shower houses, and HVAC upgrades at (3) cabins. Approximately 231 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Office- Weather-strip (2) doors, air seal 800 SF of attic
- Maintenance- Weather-strip (10) doors, air seal 800 SF of attic
- Wood Shop- Weather-strip (1) door and caulk 200 LF of joints
- Cabins- Weather-strip (3) doors
- Burnt House Residence- Weather-strip (3) doors, air seal 3,500 SF of attic, air seal 260 LF of box sills
- Restroom- Weather-strip (3) doors
- Shower house- Weather-strip (5) doors, air seal 750 SF of attic

The (1) existing campground shower house is served by (4) 82-gallon electric tank water heaters. Additionally, there is a Group Camp shower house that is served by (4) 50-gallon electric tank water heaters. For each shower house, McClure proposes to replace the existing domestic hot water storage type units with new propane-fired, tankless instantaneous units of the same capacity. New propane piping shall be provided from the units to the exterior for connection to propane tank provided by DCNR.

The (1) existing year-round restroom is served by an electric tank domestic water heater. McClure proposes to replace the existing electric tank water heater with a new electric, tankless instantaneous unit in the same location.

The Bear's Den cabin is heated and cooled by an existing PTAC unit (packaged terminal air conditioner) which is in need of replacement. McClure proposes to replace the existing unit, in kind, with (1) new PTAC in the same location.

The Fisher's Haven cabin is heated and cooled by (2) existing PTAC units (packaged terminal air conditioners) which are in need of replacement. McClure proposes to replace the existing units, in kind, with (2) new PTACs in the same location.

The Director's cabin is heated and cooled by (2) existing PTAC units (packaged terminal air conditioners) which are in need of replacement. McClure proposes to replace the existing units, in kind, with (2) new PTACs in the same location.

The Twin Fawn House is currently served by an oil-fired furnace installed in 2018. Per DCNR's request, the building will be upgraded with cooling throughout and provided with an associated condensing unit located on grade. McClure will evaluate retrofitting the existing furnace with a DX cooling coil. If it is determined that the retrofit is not possible, then a wall-mounted, ductless split system unit shall be provided.

Boyd Big Tree Preserve Conservation Area

Work within Boyd Big Tree Preserve Conservation Area focuses on lighting upgrades only. Approximately (17) total lighting retrofits or replacements are included.

Caledonia State Park

Work within Caledonia State Park focuses on general measures, fuel conversions for (1) Shower House domestic hot water system, and HVAC upgrades at Cottage #2. Approximately 674 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Park Office- Weather-strip (4) doors and sheath 2,765 SF of truss bottoms
- Forestry Heritage Museum- Weather-strip (2) doors and (1) attic hatch
- Maintenance Garage- Weather-strip (4) doors and (1) attic hatch
- Cottage #2- Weather-strip (2) doors and air seal 112 LF of band joist
- Park Manager's Residence- Weather-strip (3) doors and sheath 288 SF of truss bottoms

The (1) existing pool shower house is served by electric tank domestic water heaters. McClure proposes to replace the existing domestic hot water storage type units with new propane-fired, tankless instantaneous units of the same capacity. New propane piping shall be provided from the units to the exterior for connection to propane tanks provided by DCNR.

The Caledonia Cottage #2 is a 2-story building which currently has no cooling. Per DCNR's request, the Cottage will be upgraded with cooling throughout and provided with an associated condensing unit located on grade.

Canoe Creek State Park

Work within Canoe Creek State Park focuses on general measures, fuel conversions for domestic hot water systems and HVAC equipment, and HVAC upgrades at (8) cabins. Approximately 451 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Office- Weather-strip (2) doors
- Maintenance Building- Weather-strip (7) doors, air seal/sheath 1,980 SF of ceiling
- Education Center- Weather-strip (3) doors, air seal and insulate 1,400 SF of attic
- Well Building- Weather-strip (2) doors
- Cabins- Weather-strip (8) doors
- Wastewater Plant- Weather-strip (3) doors
- Restroom- Weather-strip (4) doors

The (1) existing pool shower house is served by (2) 80-gallon electric tank water heaters. McClure proposes to replace the existing domestic hot water storage type units with new propane-fired, tankless instantaneous units of the same capacity. New propane piping shall be provided from the units to the exterior for connection to propane tank provided by DCNR.

The (1) existing year-round restroom is served by an electric tank domestic water heater. McClure proposes to replace the existing electric tank water heater with a new electric, tankless instantaneous unit in the same location.

The Park Office is served by a geothermal system that was installed in 2001. McClure proposes to replace the existing (1) geothermal heat pump, in kind, with a new heat pump of the same capacity.

The Maintenance building is served by an existing 210 MBH oil-fired, hot water boiler. McClure proposes to replace the existing boiler with a new dual fuel, propane-fired/wood boiler in the same location. New hot water unit heaters shall be provided at the existing unheated garage bays. New hot water piping shall be extended to the new unit heaters from the boiler. The existing oil tanks located outside on grade shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

Codorus State Park

Work within Codorus State Park focuses on general measures, fuel conversions for major HVAC systems along with (5) Shower houses, and HVAC upgrades at (3) Cottages and (2) Yurts. Water conservation is also included. Approximately 908 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Park Office/Visitors Center- Weather-strip (7) doors and air seal 172 LF of band joist
- Maintenance- Weather-strip (2) doors and sheath 3,500 SF of truss bottoms
- Main Launch Unisex Restroom- Sheath 208 SF of truss bottoms
- Park Manager's Residence- Weather-strip (3) doors and air seal 144 LF of band joist
- Assistant Park Manager's Residence- Weather-strip (1) door and air seal 133 LF of band joist

The (1) existing pool shower house is served by electric tank domestic water heaters. McClure proposes to replace the existing domestic hot water storage type units with new propane-fired, tankless instantaneous units of the same capacity. New propane piping shall be provided from the units to the exterior for connection to propane tanks provided by DCNR.

At the Classroom Building the office is served by a 189 MBH oil-fired/DX split system air handling unit (AHU) in poor condition. McClure proposes to replace the existing unit with a new propane-fire/DX split system AHU of the same capacity. The existing 1,000-gallon oil tank located underground shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

At the Assistant PM Residence, the existing oil-fired furnace is in need of replacement. McClure proposes to replace the existing furnace with a new propane-fired furnace of the same capacity. The existing 275-gallon oil tank located in the basement shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

At the Gift Shop the existing 140 MBH oil-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The existing 250-gallon oil tank located in the basement shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

At the Maintenance building the existing 250 MBH oil-fired furnace is in need of replacement. McClure proposes to replace the existing furnace with a new propane-fired furnace of the same capacity. The (3) existing oil tank located outdoors on grade shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank by DCNR.

The (5) existing shower houses (including the pool shower house) are each served by (1) 119-gallon electric tank water heater. For each shower house, McClure proposes to replace the existing domestic hot water storage type unit with new propane-fired, tankless instantaneous units of the same capacity. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

Codorus State Park is one of few parks within the DCNR system that does not generate its own domestic water supply onsite through treatment. Codorus State Park utilizes local utility water supply at its buildings. McClure is proposing the following:

- Installing (73) low flow aerators on sinks/faucets throughout the park.
- Installing (20) 1.5 GPM shower heads in various shower houses
- Replacing (68) toilets throughout the park with new 1.28 GPF toilets (either tank or valve type)
- Replacing (9) urinals throughout the park with new .125 GPF urinals

As part of the water conservation scope, McClure Company has assumed:

- Existing to remain fixtures are in operational condition, such as sink basins, shower handles/diverter valves, etc.
- No additional general conditions work is required for fixture replacements
- Isolation valves on the domestic water supply are in operational condition
- Fixtures will be replaced like for like, no new ADA style fixtures will be installed to replace non-ADA fixtures

Colonel Denning State Park

Work within Colonel Denning State Park focuses on general measures and fuel conversions for major HVAC systems. Approximately 209 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Garage- Weather-strip (5) doors
- Maintenance Building- Weather-strip (10) doors, air seal 48 LF window perimeters
- Park Office- Weather-strip (4) doors
- Park Residence- Weather-strip (4) doors and (1) attic hatch, air seal window air conditioners
- Water Treatment Plant- Weather-strip (1) door.

At the Maintenance building the existing oil-fired furnace is in need of replacement. McClure proposes to replace the existing furnace with a new propane-fired furnace of the same capacity. The existing 550-gallon oil tank located outdoors on grade at the rear of the building shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

The Park Office is served by an existing 2-Ton DX/oil-fired split system air handling unit (AHU) in poor condition. McClure proposes to replace the existing unit with a new propane-fired/DX split system AHU in the same location. The supply ductwork shall be reconfigured/extended to provide additional heating to the basement areas. The existing oil tank

located in the mechanical room shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

The residence is served by an existing 192 MBH oil-fired, hot water boiler and the garage is served by an existing 101 MBH oil-fired furnace. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The existing garage oil-fired furnace shall be replaced with a new propane-fired furnace of the same capacity. The existing 550-gallon underground oil tank at the residence and the existing 275-gallon above ground oil tank at the garage shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

Cowan's Gap State Park

Work within Cowan's Gap State Park focuses on general measures only. Approximately 509 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Park Office- Weather-strip (2) doors and (1) attic hatch
- Tower Building- Caulk 160 LF of joints
- Maintenance Building- Weather-strip (3)
- Shower houses- Weather-strip (4) doors, sheath 872 SF of truss bottoms
- Lift Station- Weather-strip (1) door, caulk 68 LF of joints
- Park Residence- Weather-strip (1) door, air seal 112 LF of band joist
- Water Tower Building- Caulk 160 LF of joints

Fowler's Hollow State Park

Work within Fowler's Hollow State Park focuses on general measures only. Approximately (11) total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Restroom- Weather-strip (4) doors
- Water Treatment Plant- Weather-strip (1) door

Gifford Pinchot State Park

Work within Gifford Pinchot State Park focuses on general measures, fuel conversions for major HVAC systems along with (8) Shower houses, and HVAC upgrades at (10) Cabins, (3) Cottages, and (2) Yurts. Approximately 895 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Park Manager's Residence- Weather-strip (7) doors, air seal 62 LF of band joist and 1,300 SF of attic, along with insulating 1,300 SF of attic
- Park Office- Weather-strip (6) doors, air seal 248 LF of band joist, sheath 1,696 SF of truss bottoms, and sheath/insulate, 1,176 SF of rafters
- New Maintenance Building- Weather-strip (8) doors and 1 pulldown stair cover
- Old Maintenance Building- Weather-strip (3) doors, sheath 380 SF of wall, and caulk 550 LF of plywood joints
- Assistant Manager's Residence- Weather-strip (5) doors
- Quaker Race Unisex Restroom- Weather-strip (1) door and sheath 100 SF of truss bottoms
- Water Treatment- Weather-strip (4) doors
- Boat Mooring Unisex Restroom- Weather-strip (3) doors, sheath 200 SF of truss bottoms, and caulk 50 LF of plywood joints
- Conewago Day Use- Weather-strip (2) doors and (1) attic hatch, sheath 64 SF of truss bottoms, caulk 50 LF of plywood joints, and air seal 188 LF of roof/wall interface

- Environmental Learning Center- Weather-strip (7) doors

The (7) existing shower houses are each served by (2) 119-gallon electric tank water heaters. Additionally, the beach shower house is served by (1) 119-gallon electric tank water heater. For each shower house, McClure proposes to replace the existing domestic hot water storage type units with new propane-fired, tankless instantaneous units of the same capacity. New propane piping shall be provided from the units to the exterior for connection to propane tank provided by DCNR.

In addition to the scope above, the existing electric unit heaters serving the (7) shower houses shall be replaced with propane-fired unit heaters in the same location. A unit heater shall be provided for each side of the shower house. This is typical for all the campground shower houses. New heaters will not be provided at the beach shower house.

The Environmental Learning Center is served by a wood stove and electric unit heaters. McClure proposes to install a new propane-fired/DX split system air handling unit to serve as the primary heating and cooling source for the building. The new unit will be located in the storage room. New supply and return ductwork shall be provided from the unit to serve the space. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR. The existing electric unit heaters shall remain as supplemental heating. New stand-alone controls will also be provided for the building as part of the HVAC upgrades. For domestic hot water the building is served by an electric, 66-gallon tank domestic water heater. McClure propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity.

At the Park Manager's Residence, the existing 105 MBH oil-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The existing 500-gallon oil tank located underground at the rear of the residence shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

At the Assistant Park Manager's Residence, the existing 175 MBH oil-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The (2) existing oil tanks located in the basement shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

At the Dam Apartments the existing oil-fired furnace is in need of replacement. McClure proposes to replace the existing furnace with a new propane-fired furnace of the same capacity. The existing oil tank located in the basement shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR. For domestic hot water the building is served by an electric, 50-gallon tank domestic water heater. McClure propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity.

At the New Maintenance Building the existing 400 MBH propane-fired furnace is failing and in need of replacement. McClure proposes to replace the existing furnace, in kind, with a new propane-fired furnace of the same capacity. For domestic hot water the building is served by an electric, 40-gallon tank domestic water heater. McClure propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity.

At the Old Maintenance Building the existing 156 MBH oil-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The existing oil tank located outdoors, on grade shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

At the Park Office the building is served by 112 MBH and 125 MBH DX/oil-fired split system air handling units (AHU). McClure proposes to replace the existing units with a new propane-fired/DX split system AHUs of same capacity. The existing oil tank located in the basement shall be removed. New propane piping shall be provided from the units to the exterior for connection to the existing 1,000-gallon propane tank by DCNR. For domestic hot water the office is served by an electric, 30-gallon tank domestic water heater. McClure propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity.

At the Water Treatment Plant, a new roof-mounted exhaust fan and wall-mounted outdoor air intake louver with motor-operated damper shall be provided to improve air circulation through the plant.

At the Environmental Learning Center, the existing windows are scheduled for replacement as part of this proposal. Approximately 960 SF of windows will be replaced. This includes removal and replacement of the existing single paned windows with a new storefront style system, basis of design Kawneer 541T Versa Glaze, within the existing wood framework. New glazing will be 1” insulated clear tempered glass with SolarBan 60 Low-E coating.

For the window upgrades at the ELC McClure has assumed the following:

- Existing window systems do not contain hazardous materials, and no cost has been included for disposal of hazardous materials if encountered.

Greenwood Furnace State Park

Work within Greenwood Furnace State Park focuses on general measures and fuel conversions for major HVAC systems. At the Park’s shower house, the domestic hot water system has recently been upgraded, however, the existing comfort heating will be upgraded to a propane fired system. Approximately 451 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Park Office- Weather-strip (4) doors
- Park Manager’s Residence- Weather-strip (3) doors
- Maintenance Building- Weather-strip (7) doors
- Shower house- Weather-strip (4) doors and (1) attic hatch
- Restrooms- Weather-strip (3) doors

The (1) shower house is served by existing propane-fired instantaneous domestic water heaters. McClure proposes to replace the (5) existing electric unit heaters used for comfort heating with propane-fired unit heaters in the same location. The existing propane domestic water heater shall remain. The new unit heaters will use the same propane fuel source and storage as the domestic water heaters.

The Park Office is served by (2) existing DX/oil-fired split system air handling units (AHU). McClure proposes to replace the existing units with (2) new propane-fired/DX split system AHUs of the same capacity. The existing oil tank shall be removed. The office is served by an electric, 50-gallon tank domestic water heater. McClure propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

At the Park Residence the existing 138 MBH oil-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The (2) existing oil tanks located in the basement shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

At the Beach House the existing oil-fired, forced air furnace is in need of replacement. McClure proposes to replace the existing furnace with a new propane-fired furnace of the same capacity. The existing 1,000-gallon oil tank located underground at the front corner of the building shall be removed. The building is served by an oil-fired, 86-gallon tank domestic water heater. McClure propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

Joseph E. Ibberson Conservation Area

Work within Joseph E. Ibberson Conservation Area focuses on lighting upgrades only. Approximately (12) total lighting retrofits or replacements are included.

Kings Gap Environmental Education Center

Work within Kings Gap Environmental Education Center focuses on lighting upgrades, but also includes replacement of solar vent fans. Approximately (427) total lighting retrofits or replacements are included.

DCNR has requested that the solar vent fans serving the (2) restrooms be replaced, as they are in poor or inoperable condition. McClure will replace each system, in kind, with a new solar vent fan at each location.

Little Buffalo State Park

Work within Little Buffalo State Park focuses on general measures, fuel conversions for major HVAC systems along with (1) Shower house. Approximately 661 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Shower house- Weather-strip (4) doors
- Campground Well House- Weather-strip (1) door
- Comfort Station #5- Weather-strip (5) doors, air seal 79 LF of roof/wall interface
- Maintenance Building- Weather-strip (7) doors, air seal 220 LF of roof/wall interface
- Park Office- Weather-strip (7) doors
- Rec Hall- Weather-strip (4) doors and air seal exterior penetrations
- Lodge- Weather-strip (3) doors, air seal 72 window perimeters
- Residence- Weather-strip (4) doors
- Wastewater Treatment- Weather-strip (5) doors
- Well House #1- Weather-strip (1) door and air seal exterior penetrations
- Well House #2- Weather-strip (1) door

At the Residence the existing oil-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The existing 500-gallon oil tank located underground at the front corner of the building shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

At the Residence barn the existing oil-fired, forced air furnace is in need of replacement. McClure proposes to replace the existing furnace with a new propane-fired boiler of the same capacity. The existing oil tank located indoors shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

The Maintenance building is served by an electric, 80-gallon tank domestic water heater. McClure propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity.

The (1) existing pool shower house is each served by (1) 120-gallon electric tank water heater. McClure proposes to replace the existing domestic hot water storage type unit with new propane-fired, tankless instantaneous units of the same capacity. New propane piping shall be provided from the units to the exterior for connection to propane tank provided by DCNR.

Mont Alto State Park

No scope of work is proposed for this site.

Penn-Roosevelt State Park

No scope of work is proposed for this site.

Pine Grove Furnace State Park

Work within Pine Grove Furnace State Park focuses on general measures, fuel conversions for major HVAC systems along with (1) Cabin. Approximately 885 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Park Office- Weather-strip (3) doors, sheath 104 SF of wall
- Park Manager's Residence- Weather-strip (1), air seal 122 LF of band joist, sheath and insulate 1,108 SF of rafters

- Maintenance- Weather-strip (8) doors
- Laurel Shower house- Weather-strip (2) doors, sheath 108 SF of truss bottoms, caulk 125 LF of plywood joints
- Fuller Shower house- Weather-strip (2) doors, sheath 108 SF of truss bottoms, caulk 125 LF of plywood joints
- Iron Master’s Mansion- Weather-strip (2) doors
- Furnace Comfort Station- Sheath 70 SF of truss bottoms, caulk 125 LF of plywood joints
- Family Shower house- Sheath 80 SF of truss bottoms, caulk 150 LF of plywood joints
- CXT Restrooms- Weather-strip (5) doors

The existing Paymaster’s Cabin is served by a propane-fired gas furnace and an electric domestic water heater tank. McClure proposes to replace the existing electric domestic water heater tank with a propane-fired, tankless instantaneous water heater in the same location. The existing propane-fired gas furnace shall remain. Per DCNR’s request, the Cabin will be upgraded with cooling throughout and provided with an associated condensing unit located on grade.

At the Maintenance building the existing oil-fired, forced air furnace is in need of replacement. McClure proposes to replace the existing furnace with a new propane-fired boiler of the same capacity. The existing oil tank located outdoors on grade shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR. For domestic hot water, the building is served by an electric, 50-gallon tank domestic water heater. McClure propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity.

At the Iron Master’s Mansion, the building is served by electric baseboard heating and window AC units. McClure proposes to install (2) new propane-fired/DX split system air handling units in the attic and basement. New ductwork shall be provided in the attic to serve the 2nd floor space. New ductwork shall be provided in the basement and up to the first-floor spaces. New condensing units shall be installed on pavers on grade. New duct chases shall be provided, as necessary, on the first floor for duct routing. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

At the Residence, the building domestic hot water is provided by the hot water heating system and is connected to an unused electric, 80-gallon tank domestic water heater. McClure propose to disconnect the domestic hot water from the heating system and replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity.

Prince Gallitzin State Park

Work within Prince Gallitzin State Park focuses on general measures, fuel conversions for major HVAC systems, and HVAC upgrades at (10) Cabins and (5) Cottages. Additionally, the underground domestic water line serving the campground is scheduled for replacement. Approximately 538 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Park Office- Weather-strip (6) doors
- Maintenance Building- Weather-strip (6) doors, air seal 3,200 SF of ceiling
- Carpenter’s Shop- Weather-strip (7) doors, air seal 210 LF of roof/wall interface
- Boat House- Weather-strip (1) door, air seal 100 SF of wall
- Cabins- Weather-strip (10) doors, air seal and insulate 6,000 SF of attic
- Pavilion 2 Restroom- Weather-strip (3) doors, air seal 500 SF of wall
- Water Treatment Plant- Weather-strip (3) doors, air seal and insulate 1,500 SF of attic
- Chemical Storage- Weather-strip (2) doors
- Campground Maintenance- Weather-strip (5) doors, air seal 130 LF of roof/wall interface, air seal and insulate 1,200 SF of attic
- Campground Shower House- Weather-strip (3) doors
- Campground Office- Weather-strip (1) door
- Pickerel Pond Restroom- Weather-strip (5) doors, air seal and insulate 1,000 SF of attic
- Beaver Valley Marina- Weather-strip (4) doors, air seal and insulate 1,000 SF of attic

The (4) existing shower houses are each served by (2) 225-gallon electric tank water heaters. For each shower house, McClure proposes to replace the existing domestic hot water storage type units with new propane-fired, tankless instantaneous units of the same capacity. New propane piping shall be provided from the units to the exterior for connection to propane tank provided by DCNR.

As detailed in the Typical Cabin scope summary above in the report, the (10) existing cabins will be upgraded with new wall-mounted, ductless split system heat pumps to provide heating and cooling, as well as new supplemental electric resistance heat. Additionally, the (10) cabins each have humidity building up in their crawlspace. McClure proposes to install an exhaust fan ducted to the exterior in each crawlspace. The exhaust fan shall operate in response to a crawlspace humidistat.

The main domestic water service to the campground is in poor condition, often failing during summer operation with leaks and pressure issues. McClure proposes to excavate approximately 4,545 LF of the existing water line to a depth of about 4 ft. The existing piping infrastructure will be removed and replaced with new 6" HDPE water mains tied into the existing main outside the campground. All branch piping to shower houses, restrooms, and hydrants is in good operations condition and is existing to remain. The existing branch piping will be tied into the new water main. Included in the scope is backfill, grading, and seeding as needed. In cases where the main drive is crossed, 2A subbase and paving will be provided.

The Park Office is served by an existing 175 MBH oil-fired, hot water boiler and (2) HW/DX split system air handling units (AHU). McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The (2) existing AHUs shall be replaced, in kind, with new HW/DX units of the same capacity. The (2) existing oil tanks located indoors shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR. The building is served by an electric, 30-gallon tank domestic water heater. McClure propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity.

The Maintenance building is served by an existing 210 MBH oil-fired, hot water boiler. McClure proposes to replace the existing boiler with a new dual fuel, propane-fired/wood boiler in the same location. The existing oil tank located outside on grade shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

At the Carpentry Building the existing 95 MBH oil-fired, forced air furnace is in need of replacement. McClure proposes to replace the existing furnace with a new propane-fired furnace boiler of the same capacity. The new furnace shall be located out of the wood shop area and the existing supply ductwork shall be reconfigured/extended to serve the space. The existing oil tank located indoors shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR.

As part of the campground water main replacement McClure has assumed the following:

- The existing path of piping will be retained with the new layout, no new trenching is included
- Branch piping is in operable condition and does not require modifications
- Final seeding and site work is not included. Trench will be backfilled, and seeding will be applied
- Any work requiring the trench to cross the drive path will be restored with 2A subbase and paving as needed, however, no paving of the main drive is included outside the above scope of work

Samuel S. Lewis State Park

Work within Samuel S. Lewis State Park focuses on general measures, fuel conversions for major HVAC equipment, and roofing upgrades. Approximately (37) total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Park Office- Weather-strip (3) doors and (1) pull down stair, caulk 286 LF of joints

For the Park Office/Maintenance Building and the (2) restrooms, McClure is proposing to remove the existing roofing, install synthetic roofing underlayment, necessary aluminum step, base, counter flashing and edge metal, along with limited lifetime architectural shingles.

Shawnee State Park

Work within Shawnee State Park focuses on general measures, domestic hot water fuel conversions for (2) shower houses, and HVAC improvements at (3) cottages and (2) yurts. Approximately 682 total lighting retrofits or replacements are included. General measures include work at the Park Region 3 office.

At various structures throughout the park, building envelope improvements are proposed.

- Park Office- Weather-strip (4) doors
- Maintenance Building- Weather-strip (13) doors
- Restrooms- Weather-strip (22) doors
- Contact Station- Weather-strip (2) doors
- Wastewater Treatment Plant- Weather-strip (2) doors
- Assistant Park Manager’s Residence- Weather-strip (3) doors, air seal and insulate 3,000 SF of attic
- Park Manager’s Residence- Weather-strip (3) doors, air seal and insulate 3,000 SF of attic

The (2) existing shower houses are each served by (4) 80-gallon electric tank water heaters. For each shower house, McClure proposes to replace the existing domestic hot water storage type units with new propane-fired, tankless instantaneous units of the same capacity. New propane piping shall be provided from the units to the exterior for connection to propane tank provided by DCNR. The remaining shower houses within the park have already been converted to propane.

The (3) existing year-round restrooms are served by electric tank domestic water heaters. For each restroom, McClure proposes to replace the existing electric tank water heater with a new electric, tankless instantaneous unit in the same location.

The Lakeside Lodge is a 2-story building which currently has no cooling. Per DCNR’s request, the Lodge will be upgraded with cooling throughout and provided with an associated condensing unit located on grade.

Susquehannock State Park c/o Gifford Pinchot State Park

Work within Susquehannock State Park focuses on general measures only. Approximately (47) total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Park Office- Weather-strip (6) doors, air seal and insulate 608 SF of attic

Trough Creek State Park c/o Canoe Creek State Park

Work within Trough Creek State Park focuses on general measures, fuel conversions for major HVAC equipment, and HVAC upgrades at the Lodge. Approximately 141 total lighting retrofits or replacements are included.

At various structures throughout the park, building envelope improvements are proposed.

- Park Office- Weather-strip (3) doors
- Maintenance Building- Weather-strip (5) doors
- Well House- Weather-strip (1) door, air seal and insulate 110 SF of attic
- Lodge- Weather-strip (2) doors, air seal and insulate 1,700 SF of attic, air seal 180 LF of box sills

At the Lodge the existing 192 MBH oil-fired, hot water boiler is in need of replacement. McClure proposes to replace the existing boiler with a new propane-fired boiler of the same capacity. The building is served by an electric, 50-gallon tank domestic water heater. McClure propose to replace the existing domestic hot water storage type unit with a new propane-fired tankless, instantaneous unit of the same capacity. The (2) existing oil tanks located in the basement shall be removed. New propane piping shall be provided from the unit to the exterior for connection to propane tank provided by DCNR. Additionally, per DCNR’s request, the Lodge will be upgraded with cooling throughout and provided with an associated condensing unit located on grade.

Warriors Path State Park

No scope of work is proposed for this site.

Whipple Dam State Park

No scope of work is proposed for this site.

4. Measurement and Verification

The following section details the intended measurement and verification plan for the scope of work proposed in Section 3. Additionally, this section details the utility baselines, adjustments, rates, and possible future adjustments as necessary.

This section of the IGA report details the specific scopes of work associated with each site. Many sites receive the same general scopes of work, such as lighting, building envelop upgrades, and fuel conversions, which are generally described below with any specific details concerning each site described within that site’s scope of work. The table below indicates the general scopes of work for all considered measures.

Utility Baseline Analysis

Methodology

The baseline for this project varies by site based on data provided through various sources such as site databases, EnergyCAP, DCNR Central Office records, and actual utility bills. The usage was analyzed on a monthly basis and totaled for the year. At some sites no or limited data exists, and assumptions of usage were necessary. The table on the following page indicates the baseline for each site by utility and if adjustments were made to the baseline, either in usage or rate.

Key	
E	Electric
NG	Natural Gas
P	Propane
O	Oil
C	Coal
W	Water
CY	Calendar Year

Site	Baseline	Adjustments
Michaux Forest District #1	E, NG CY 2016, P CY 2017	Yes E Usage/Rate, P Rate
FFP Black Moshannon Tanker	N/A	Yes E Usage/Rate
Buchanan Forest District #2	E, O CY 2017	No
Tuscarora Forest District #3	E CY 2017	Yes E Usage, O, P Usage/Rate
Rothrock Forest District #5	E CY 2017, O CY 2016	Yes E Usage
Bald Eagle Forest District #7	E, O CY 2016	No
Moshannon Forest District #9	E, O CY 2017	Yes P Usage/Rate
Sproul Forest District #10	E, O CY 2017	Yes E Usage
Tiadaghton Forest District #12	E, O, P CY 2017	Yes E Usage, P Rate
Elk Forest District #13	E, O, NG, P CY 2016	Yes E Usage, O, P Rate
Susquehannock Forest District #15	E, NG CY 2017, P CY 2016	Yes E Usage
Tioga Forest District #16	E, O, NG, P CY 2016	Yes E, O Usage, P Rate
Penn Nursery #21	E, O, P CY 2017	Yes P Rate
Park Region 1 Office	See Elk Forest District 13	
Bald Eagle State Park	E, O, P CY 2017	No
Bendigo State Park	E CY 2018, P CY 2016	No
Black Moshannon State Park	E CY 2018, P CY 2016	No
Chapman State Park	E, P CY 2017	Yes P Rate
Cherry Springs State Park	E CY 2016, P CY 2017	No
Denton Hill State Park	O CY 2017	No
Elk Country Visitor Center	E CY 2017	No
Hills Creek State Park	E, NG, P 10/2016-9/2017	Yes P Rate
Hyner Run State Park	E CY 2018, P CY 2016	No
Kettle Creek State Park	E, P CY 2016	No
Kinzua Bridge State Park	E CY 2018, O, P CY 2017	Yes P Rate
Leonard Harrison State Park	E CY 2018, O, P CY 2016	No
Little Pine State Park	E CY 2018, O, P, C CY 2016	No
Lyman Run State Park	E CY 2017, P CY 2016	No
Mount Pisgah State Park	E, O, P CY 2017	Yes P Rate
Ole Bull State Park	E, P CY 2016	No
Parker Dam State Park	E, P CY 2017	Yes P Rate
Poe Paddy State Park	E CY 2017	Yes E Usage
Poe Valley State Park	E CY 2018, P CY 2017	No
Ravensburg State Park	N/A	Yes E Usage/Rate
Raymond B. Winter State Park	E CY 2018, P CY 2017	Yes E Usage, P Rate
Reeds Gap State Park	E, O, P CY 2017	No
Shikellamy State Park	E CY 2018, NG CY 2017	Yes E Usage
Simon B. Elliott State Park	E CY 2017	No
Sinnemahoning State Park	E, P CY 2017	Yes P Rate
Sizerville State Park	E, P CY 2016	Yes P Rate
Park Region 3 Office	See Shawnee State Park	
Big Spring State Forest Picnic Area	N/A	
Blue Knob State Park	E, O CY 2017	No

Site	Baseline	Adjustments
Boyd Big Tree Preserve Conservation Area	E CY 2018	Yes E Usage
Caledonia State Park	E CY 2018, NG, W CY 2017	No
Canoe Creek State Park	E, O CY 2017	No
Codorus State Park	E, O, P 11/2016-10/2017	Yes E Usage/Rate, P Rate
Colonel Denning State Park	E CY 2017, O CY 2016	No
Cowan’s Gap State Park	E 11/2016-10/2017, O, P CY 2016	Yes P Rate
Fowler’s Hollow State Park	N/A	Yes E Usage/Rate
Gifford Pinchot State Park	E, O 10/2016-9/2017, P 10/2016-9/2017	No
Greenwood Furnace State Park	E, O, P CY 2017	Yes P Rate
Joseph E. Ibberson Conservation Area	N/A	
Kings Gap Environmental Education Center	E CY 2018, O CY 2017	No
Little Buffalo State Park	E CY 2018, O, P CY 2016	Yes E Rate
Mont Alto State Park	N/A	
Penn-Roosevelt State Park	N/A	Yes E Usage/Rate
Pine Grove Furnace State Park	E CY 2017, O, P CY 2016	Yes P Rate
Prince Gallitzin State Park	E, O CY 2016, P CY 2017	Yes E Usage, P Rate
Samuel S. Lewis State Park	N/A	Yes E Usage/Rate
Shawnee State Park	E, O, P 11/2016-10/2017	Yes E Usage
Susquehannock State Park	E CY 2018, O, P CY 2017	Yes O, P Rate
Trough Creek State Park	E, O CY 2017	No
Warriors Path State Park	N/A	
Whipple Dam State Park	N/A	Yes E Usage/Rate

Baseline Usage and Rates

The following table shows the baseline usage, rates, and adjustments by site as provided by the above detailed baseline period.

The utility unit cost (rate) is the annual cost divided by the annual usage for the baseline period, unless the unit cost has been adjusted.



Site	Electricity					Oil					Natural Gas					Propane				
	Providers	Usage	Adj Usage	Calculated Rate	Baseline Rate	Providers	Usage	Adj Usage	Calculated Rate	Baseline Rate	Providers	Usage	Adj Usage	Calculated Rate	Baseline Rate	Providers	Usage	Adj Usage	Calculated Rate	Baseline Rate
Michaux Forest District #1	Adams Electric	4,488	79,488	\$0.272	\$0.123						Columbia Gas	3,984		\$1.120	\$1.120	Suburban Propane	753		\$2.279	\$1.553
Buchanan Forest District #2																				
FD 2 Bear Valley	Adams Electric Coop	20,562		\$0.114	\$0.114	Glassmere/ Shipley	1,581		\$2.347	\$2.347										
FD2 Chaneyville HQ																				
FD2 Sideling Hill HQ																				
Tuscarora Forest District #3																				
FD3 Bryner HQ	Valley Rural Electric Coop	8	95,008	\$40.875	\$0.162	Unknown/ Assumed		3,500		\$2.200						Unknown/ Assumed		4,750		\$1.553
FD3 East Licking Creek HQ																				
Rothrock Forest District #5																				
FD5 Whipple Dam HQ	Valley Rural Electric Coop	34,750	99,750	\$0.168	\$0.168	Glassmere/ Snedeker	2,667		\$1.604	\$1.604										
FD5 Stony Point HQ																				
FD5 Trough Creek HQ																				
FD5 Greenwood HQ																				
Bald Eagle Forest District #7																				
FD7 Eastville HQ	PPL	105,840		\$0.088	\$0.088	Superior Plus	3,062		\$1.779	\$1.779										
FD7 Hickernell HQ																				
FD7 NLV HQ																				
FD7 Troxelville HQ																				
Moshannon Forest District #9																				
FD9 Black Moshannon HQ	United Electric Coop	120,541		\$0.158	\$0.158	Glassmere	971		\$2.400	\$2.400								2,500		\$1.553
FD9 Quehanna HQ																				
FD9 Dague Forest HQ																				
FFP Black Moshannon Tanker	Penelec		10,000		\$0.158															
Sproul Forest District #10																				
FD10 Cooks Run HQ	Penelec/PPL	7,379	100,379	\$0.154	\$0.154	Superior Plus Energy Services	7,373		\$2.719	\$2.719										
FD10 Snow Shoe HQ																				
FD10 Hyner Forest HQ																				
FD10 Hyner Forest HQ																				
Tiadaghton Forest District #12																				
FD12 Jersey Mills HQ	Tri-County Rec	22,468	102,468	\$0.160	\$0.160	Multiple	3,265		\$2.277	\$2.277						Heller Gas	548		\$1.690	\$1.553
FD12 Rauchtown HQ																				
FD12 Waterville HQ																				
Elk Forest District #13																				
FD13 Hick's Run HQ	Tri-County Rec	29,384	99,384	\$0.140	\$0.140	Glassmere	7,544		\$0.612	\$2.050	National Fuel	12,578		\$0.554	\$0.554	Amerigas	481		\$3.751	\$1.553
FD13 Brooks Run HQ																				
FD13 Sizerville HQ																				
Susquehannock Forest District #15																				
FD15 Cross Forks Forest HQ	Tri-county rec	85,625	105,625	\$0.151	\$0.151						UGI	6,094		\$1.198	\$1.198	Multiple	8,277		\$1.418	\$1.418
FD15 Lyman Run Forest HQ																				
FD15 Bark Shanty HQ																				



Site	Electricity					Oil					Natural Gas					Propane				
	Providers	Usage	Adj Usage	Calculated Rate	Baseline Rate	Providers	Usage	Adj Usage	Calculated Rate	Baseline Rate	Providers	Usage	Adj Usage	Calculated Rate	Baseline Rate	Providers	Usage	Adj Usage	Calculated Rate	Baseline Rate
Tioga Forest District #16	Wellsboro / Tri - County Electric Co	75,042	100,042	\$0.119	\$0.119	Glassmere	350	700	\$2.297	\$2.297	UGI	7,554		\$0.742	\$0.742	Suburban Propane	368		\$3.764	\$1.553
FD16 Ansonia HQ																				
FD16 Armenia HQ																				
Penn Nursery #21	West Penn Power	262,613		\$0.089	\$0.089	Superior Plus/ Glassmere	815		\$2.285	\$2.285						Snedeker Energy/Propane	1,741		\$2.544	\$1.553
Park Region 1 Office (shares building with Elk Forest District 13)	Tri-County Rec				\$0.140															
Bald Eagle State Park	Penelec/West Penn Power	1,111,029		\$0.082	\$0.082	Glassmere	11,825		\$2.199	\$2.199						Kessinger	2,179		\$1.149	\$1.149
Bendigo State Park	West Penn Power	51,103		\$0.095	\$0.095											Matheson	2,206		\$2.010	\$2.010
Black Moshannon State Park	Penelec	383,245		\$0.119	\$0.119											Provanta	10,165		\$0.837	\$0.837
Chapman State Park	Penelec	223,392		\$0.124	\$0.124											Superior Plus, Ferrellgas	3,203		\$1.866	\$1.553
Cherry Springs State Park	Tri-County Rec	18,118		\$0.158	\$0.158											WOC Energy	418		\$1.548	\$1.548
Denton Hill State Park	0	0			\$0.153	Glassmere	3,358		\$2.370	\$2.370										
Elk Country Visitor Center	West Penn Power	247,680		\$0.079	\$0.079															
Hills Creek State Park	Wellsboro Electric	276,751		\$0.170	\$0.170						UGI	636		\$1.190	\$1.190	WOC Energy	1,749		\$1.933	\$1.553
Hyner Run State Park	Penelec	108,309		\$0.130	\$0.130											Hellers Gas	3,531		\$1.497	\$1.497
Kettle Creek State Park	Tri-County Rec/PPL	120,056		\$0.140	\$0.140											Provanta	4,900		\$1.030	\$1.030
Kinzua Bridge State Park	West Penn Power	218,265		\$0.083	\$0.083											Matheson	3,492		\$2.333	\$1.553
Leonard Harrison State Park	Penelec	101,301		\$0.140	\$0.140	Glassmere	315		\$2.102	\$2.102						Williams/WOC	1,024		\$1.399	\$1.399
Little Pine State Park	West Penn Power	242,363		\$0.088	\$0.088	Superior Plus	352		\$2.247	\$2.247						Heller Gas	2,980		\$1.318	\$1.318
Lyman Run State Park	Tri-County Rec	85,625		\$0.151	\$0.151											WOC Energy	3,128		\$1.499	\$1.499
Mount Pisgah State Park	Tri-County Rec/Claverback Rural	124,868		\$0.122	\$0.122	Glassmere	3,700		\$2.183	\$2.183						Suburban	772		\$1.925	\$1.553
Ole Bull State Park	Tri-County Rec	144,873		\$0.140	\$0.140											Provanta	6,201		\$0.966	\$0.966
Parker Dam State Park	United Electric Coop	309,036		\$0.169	\$0.169											Moore Propane	1,787		\$1.682	\$1.553
Poe Paddy State Park	West Penn Power	1,180	5,580	\$0.149	\$0.149															
Poe Valley State Park	West Penn Power	150,465		\$0.087	\$0.087											Snedeker	1,261		\$1.526	\$1.526
Ravensburg State Park	PPL	5,000	5,000	\$0.115	\$0.115															
Raymond B. Winter State Park	PPL	4,702	80,702	\$0.380	\$0.115											Superior Plus	4,967		\$1.871	\$1.553
Reeds Gap State Park	West Penn Power	68,678		\$0.134	\$0.134	\$0.000	4,091		\$1.381	\$1.381						Snedeker Energy	1,748		\$0.924	\$0.924
Shikellamy State Park	PPL	36,241	70,241	\$0.138	\$0.138						UGI	3,886		\$0.812	\$0.812					
Simon B. Elliott State Park	United Electric Cooperative	16,091		\$0.415	\$0.169															
Sinnemahoning State Park	Tri-County Rec	253,223		\$0.118	\$0.118											Hellers Gas	4,652		\$1.613	\$1.553
Sizerville State Park	Tri-County Rec	38,999		\$0.134	\$0.134											Matheson	1,571		\$1.837	\$1.553
Park Region 3 Office (within Shawnee State Park)	Penelec			-	\$0.147															
Big Spring State Forest Picnic Area																				
Blue Knob State Park	Bedford/Valley Rural	132,790		\$0.161	\$0.161	Glassmere	6,266		\$2.065	\$2.065										



Site	Electricity					Oil					Natural Gas					Propane				
	Providers	Usage	Adj Usage	Calculated Rate	Baseline Rate	Providers	Usage	Adj Usage	Calculated Rate	Baseline Rate	Providers	Usage	Adj Usage	Calculated Rate	Baseline Rate	Providers	Usage	Adj Usage	Calculated Rate	Baseline Rate
Boyd Big Tree Preserve Conservation Area	PPL	98	5,098	\$7.163	\$0.115															
Caledonia State Park	West Penn Power	411,625		\$0.086	\$0.086						Columbia Gas	2,461		\$1.078	\$1.078					
Canoe Creek State Park	Valley Rural Electric Coop	169,105		\$0.128	\$0.128	Multiple	2,648		\$2.112	\$2.112										
Codorus State Park	Adams Electric Cooperative, Inc.	17,210	225,210	\$0.227	\$0.123	Talley/Shiple	1,772		\$1.846	\$1.846					AmeriGas	1,075		\$5.402	\$1.553	
Colonel Denning State Park	Adams Electric Cooperative, Inc.	84,219		\$0.151	\$0.151	Multiple	941		\$1.478	\$1.478										
Cowan's Gap State Park	Valley Rural Electric Coop	465,464		\$0.130	\$0.130	Leffler Energy	374		\$1.543	\$1.543					AmeriGas	1,137		\$1.568	\$1.553	
Fowler's Hollow State Park	0	0	5,000	\$0.152	\$0.152															
Gifford Pinchot State Park	Adams Electric Cooperative, Inc	426,825		\$0.124	\$0.124	Leffler/ Talley	2,631		\$1.846	\$1.846					Amerigas	959		\$1.467	\$1.467	
Greenwood Furnace State Park	Valley Rural Electric Coop	170,407		\$0.174	\$0.174	Glassmere/ Snedeker	3,215		\$1.948	\$1.948					Heller's Gas & Custom Fireplaces	235		\$1.681	\$1.553	
Joseph E. Ibberson Conservation Area																				
Kings Gap Environmental Ed. Center	MetEd	128,944		\$0.098	\$0.098	Shiple Energy, Talley Petroleum Enterprises Inc., Leffler Energy	3,723		\$1.901	\$1.901										
Little Buffalo State Park	PPL	578,051		\$0.047	\$0.115	Leffler Energy, Shiple Energy, Talley Petroleum Enterprises Inc., Snedeker Energy LLC	2,263		\$1.578	\$1.578					Swenson Fuels Inc.	2,624		\$1.100	\$1.100	
Mont Alto State Park																				
Penn-Roosevelt State Park	0	0	5,000	\$0.165	\$0.165															
Pine Grove Furnace State Park	MetEd/West Penn Power	455,421		\$0.102	\$0.102	Suburban Propane	891		\$3.013	\$3.013					Suburban Propane / State Line Gas / Mason's Propane Service / Amerigas	3,408		\$1.692	\$1.553	
Prince Gallitzin State Park	REA Energy Coop. Inc	11,367	350,367	\$0.186	\$0.186	Glassmere	11,263		\$1.740	\$1.740					Suburban	244		\$5.148	\$1.553	
Samuel S. Lewis State Park	PPL?		20,000	\$0.115	\$0.115															
Shawnee State Park	Valley Rural Electric Coop/ PenElec	189,035	249,035	\$0.147	\$0.147	Glassmere	2,385		\$2.016	\$2.016					Bedford Valley Petroleum	652		\$1.368	\$1.368	
Susquehannock State Park	PPL	24,194		\$0.134	\$0.134	Leffler Energy	512		\$5.643	\$1.543					Roy Ressler & Son, Inc.	187		\$2.802	\$1.553	
Trough Creek State Park	Valley Rural Electric Coop	42,732		\$0.198	\$0.198	Glassmere, Snedeker	1,858		\$3.270	\$3.270										
Warriors Path State Park																				
Whipple Dam State Park	Valley Rural Electric Coop		30,000	\$0.165	\$0.165															

Escalation

The escalation rate for all utilities has been fixed at 1%, starting in the construction year. The first year of measurement and verification will include the first-year escalation.

Adjustments

McClure Company may adjust the selected baseline during the measurement and verification process as required to account for variables impacting energy use. These circumstances include, but are not limited to, changes in the facilities use, changes in occupancy, adjustments for weather compared to the baseline heating and cooling degree days as provided by NOAA, and modification to the outside air ventilation flow rates as required by code.

Adjustments have been made to the baseline usages and rates due to missing or incomplete data, or values outside of the expected range from similar facilities or historical values. As such, DCNR and McClure agree the above adjustments best reflect the usages and rates expected at each facility in absence of sufficient data to generate the baselines. For propane rate adjustments, facilities with a rate higher than the overall average of all rates or no available rate have been set to the overall average, \$1.553/gallon.

General Assumptions

The following are a list of general assumptions for the baselines

- Data provided by DCNR and DGS in various forms is representative of the actual usage at each site
- Where incomplete or missing information has been determined, usage adjustments are based on facilities similar in size or operation.
- Where incomplete or missing information has been determined, rate adjustments are based on facilities in the same area and/or served by the same utility. For propane, an overall adjustment to rate has been included in which sites with rates higher than the overall average rate of all sites with propane have been adjusted to the average rate.
- Any site that does not currently have propane will use the overall average rate as the baseline rate
- McClure has no control over the rates or escalation, and guarantees energy units, which using the baseline rates, generates the anticipated cost increase or reductions.

Measurement and Verification Plan

Overview

This section provides procedures and guidelines for quantifying savings resulting from the installation of ECMs under energy performance contracts and is intended to comply with the International Performance Measurement & Verification Protocol (IPMVP). The IPMVP was developed to provide a commonly accepted methodology for measuring energy savings associated with performance contracts. There are two components of M&V for Energy Saving Performance Contracting (ESPC) projects:

- **Verifying ECM potential to perform and generate savings** - by confirming that: i) baseline conditions are accurately defined, and ii) the appropriate equipment components or systems are properly installed, performing per specification and have the potential to generate predicted savings.
- **Verifying ECM performance (savings)** - by determining the actual energy savings achieved by the installed ECM.

M&V Approach

McClure Company's proposed Measurement and Verification (M&V) plan, which adheres to the International Performance Measurement and Verification Protocol (IPMVP) is summarized below. There are four accepted options to verifying energy savings that were created as part of the IPMVP; Option A, B, C & D. McClure shall provide measurement and verification services to confirm project savings levels as indicated in the specific M&V plan for each ECM as described

below. Due to the seasonal nature of the savings associated with this project, a full operating year will be required to confirm the operating assumptions and annual savings level for the project.

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

McClure Company and DCNR will determine energy savings in accordance with the agreed-upon M&V method detailed below, using the verification techniques defined in the plan.

Verification Techniques

Baseline energy use, post-installation energy use and energy (and cost) savings will be determined using the following M&V techniques:

- Engineering Calculations
- Metering and Monitoring
- Utility Meter Billing Analysis
- Computer Simulations
- Agreed-Upon Stipulations by The Client and McClure Company

Verifying Energy Savings

There are numerous factors that can affect energy savings during the term of a contract such as weather, operating hours, process loads and equipment operational parameters. In general, one objective may be to adjust baseline energy use up or down for factors beyond the control of McClure Company (e.g., changes in building occupancy or weather), and adjust post-installation energy use for controllable factors (e.g., maintenance of equipment efficiency).

In order to calculate energy savings, the client may, in some cases, stipulate the value of factors that are difficult to determine or that may vary during the contract term. In other situations, continuous or regular interval measurements throughout the term of the contract may be compared to baseline energy measurements to determine savings.

There are four industry-accepted options to verifying energy savings. Option A emphasizes verification of performance factors and involves determining long-term savings through use of stipulations for operational factors. Option B and C involves use of long-term metering data; Option B involves end use data analysis and Option C involves whole building data analysis. Option D involves calibrated building simulation.

Option A focuses on physical assessment of equipment changes to ensure the installation is to specification, separated from the operation for other systems within the facility. Key performance factors are determined with spot or short-term measurements, while operational factors are often stipulated based on analysis of historical data or manufacturer's specified data. Option A includes processes to ensure baseline conditions are defined, equipment has been installed, meets specified conditions, and is operational, and any necessary measurements for operation of equipment.

Option A will be used to measure many of the electrical and fuel energy savings, using one-time pre and post measurement. Stipulated variables may include hours of operation, manufacturer's data, and industry standard engineering calculations. The savings will be projected through the remaining guarantee years, escalated annually.

Option A (Modified) is similar to Option A but utilizes partial field measurements or equipment specifications to determine energy savings, isolated from the energy use of the remainder of systems within the facility. As with Option A, processes are included to ensure baseline conditions are defined, equipment has been installed, meets specified conditions, and is operational. This method will primarily be used to verify savings associated with fuel conversions and HVAC upgrades. The savings will be projected through the remaining guarantee years, escalated annually.

Option B savings are determined after the project completion by short term or continuous measurements taken up to one year following the completion of the installation. The baseline for option B is determined through energy measurements during the pre-construction phase. The actual baseline is projected to an annual cost through use of industry standard

engineering calculations. The savings are determined by comparison of the baseline to the measured results post installation. Option B is not proposed for any measure in this project.

Option C is also referred to as the “whole house” method to determine savings. The current year utility bills are compared to historical bills. The historical bills are adjusted to account for factors such as weather. The savings are determined by analysis of utility meter (or sub-meter) data using techniques from simple comparison to regression analysis. While Option C is not proposed for any measure in this project, historic utility bills will be part of the Option A and A (Modified) analysis as detailed above as a form of fuel use measurement.

Option D or Agreed Upon Savings are determined through simulation of facility components and/or the whole facility. The savings are determined by energy simulation/modeling calibrated with monthly utility billing data and/or end-use metering. This method provides the documentation and industry standard engineering calculations verifying the operation of the system during the baseline and post installation of equipment. Much like Option A, parameters will be stipulated, such as equipment efficiency, hours of operation, changes to insulation values, or changes in existing conditions. Agreed Upon Energy Savings will be used to measure the upgrades to building envelope and commissioning of existing systems, as the verified changes are in insulating values or operational parameters, such as hours of operation, which are verified as part of the process. These changes are then part of industry standard engineering calculations to provide energy savings. The savings will be projected through the remaining guarantee years, escalated annually.

General M&V Options

General Scope	M&V Option
LED Lighting	A
Building Envelope	D
Roofing Upgrades	D
Window Upgrades	D
Garage Door Upgrades	D
Storage Upgrades	D
HVAC System Upgrades	A(m)
DHW System Upgrades	A(m)
Boiler/Furnace Upgrades	A(m)
Controls/Recommissioning	D
Residence HVAC/Boiler/DHW	A(m)
Cabin HVAC	A(m)
Cottage/Yurt Heating	N/A
Shower House DHW Upgrades	A(m)
Restroom DHW Upgrades	A(m)
Water Conservation	A(m)
Solar Vent Fan	N/A
Gas Well/Alternate Fuel Source	A(m)
Underground Utility Replacement	N/A
EV Charging Station	N/A
On Lot Sewage System Upgrades	D

LED Lighting – based on 10% pre and post installation measurements of volt/amps and light levels. Hours of operation will be stipulated.

Building Envelope, Roofing Upgrades, Window Upgrades, Garage Door Upgrades, Storage Upgrades – agreed upon savings based on inspection of existing conditions and verification of installation for weatherization, air sealing, or equipment based on manufacturer’s data for windows, doors, and sealants.

HVAC System Upgrades – specific equipment will be pre and post metered using dataloggers or control system. Boiler replacements included as part of this general scope will use fuel consumption data from historic utility bills and/or equipment efficiency for pre data, and combustion efficiency and/or manufacturer’s data for post data.

DHW System Upgrades, Boiler/Furnace Upgrades, Residence HVAC/Boiler/DHW – locations with similar systems will have 10% measured pre and post using dataloggers. Historic utility bills may be used for existing equipment data.

Controls/Recommissioning – agreed upon savings based on review of current operating parameters for pre-measurements and verification of revised parameters for post-measurements

Cabin HVAC– locations with similar systems will have 10% measured pre and post using dataloggers. Historic utility bills may be used for existing equipment data. With the addition of cooling, no direct measurement and verification is required for this measure, however, the increased energy usage as a result of implementing cooling can be provided for documentation purposes. This value will be a projection of usage increase similar to the calculation for thermal savings on the heating system.

Shower House DHW Upgrades and Restroom DHW Upgrades – locations with similar systems will have 10% measured pre and post using dataloggers. Historic utility bills may be used for existing equipment data. Equipment efficiency testing will be for pre and post installation.

Water Conservation – flow rates of fixtures will have a statistically valid sample measured to verify baseline flows. Manufacturer’s data will be used post installation to determine reduction in flows through industry standard engineering calculations along with stipulated variables, such as system usage.

Solar Vent Fans, Underground Utility Replacement, EV Charging Station – no measurement and verification is required as part of these scopes as no savings has been claimed

Gas Well/Alternate Fuel Source – locations with similar systems will have 10% measured pre and post using dataloggers. Historic utility bills may be used for existing equipment data.

On Lot Sewage System Upgrade – agreed upon savings based on review of current operating parameters for pre-measurements and verification of revised parameters for post-measurements

Hours of Operation

The follow table indicates the hours of operation by space type, not by actual site. McClure has provided these hours of operation based on investigation and information provided by each site to determine average hours of operation by space type. Not all space types are applicable to all sites. These hours also serve as the lighting hours for savings calculations.

Space Type	Description	Hours
Administrative	Admin/ Regional Office/ RMC Building	2600
	Park Office	4368
	Forest District HQ Building	2080
	Ranger Office	2080
	Marina Office	2520
	Low General Storage	520
	High General Storage	780
	Mech/ Elec Space	520
Maintenance & Storage	Maintenance/ Garage	2080
	Cold Storage	1040
	Hazardous Storage	780
	Lumber Shed	780
	Shed	780
	Vehicle Storage	780
	Warehouse	1300
	Sign Shop	2080
Bath, Toilet & Changing	Year-Round Restroom	8760
	Bath/ Shower/ Wash House	5880
	Changing/ Dressing Room	4200
	Comfort Station/ Seasonal Restroom	5880
Overnight	Cabin – Modern	2520
	Cabin – Rustic	2520
	Camping Cottage	2520
	Inn	2912
	Lodge	2912
	Yurt	2520
	Group Camp	1080
	Dwelling	Apartment
Housing		2912
Residence		2912
Staff Quarters		2912
Retail	Camp Store	720
	Gift Shop	3640
Food & Beverage	Concession	1680
	Kitchen	1680
Historical & Demonstration	Blacksmith Shop	780
	Carpentry Shop	780
	Sawmill	780
	Mill	780
	Carriage House	780
	Lighthouse	780

Space Type	Description	Hours	
	Mansion	780	
	Memorial	780	
	Museum	780	
	Iron Furnace	780	
	Limestone Kiln	780	
	Observatory	780	
	Chapel	780	
	Church	780	
	Temple	780	
	Agrarian	Barn	1560
		Stable	1560
Nursery		1560	
Education	Environmental Education Center	1500	
	Environmental Learning Center	1500	
	Nature Center	2600	
	Visitor Center	4368	
Shelters	Shelter	840	
	Pavilion	360	
	Gazebo	840	
Water & Recreation	Pool	1680	
	Pool Filter Building	420	
	Pier	1680	
	Boat House	1680	
	Boat Launch	1680	
	Boat Rental	1680	
	Marina	1680	
	Fuel	Gas House	520
Gas Pump Building		520	
Gas Shed		520	
Oil Shed		520	
Oil		520	
Natural Gas		520	
Propane		520	
Water Supply & Control	Gauge Station	520	
	Dam	520	
	Dam Control Tower	520	
	Weir	520	
Water Distribution	Pressure Station	520	
	Valve House	520	
	Water Distribution System	520	
	Potable Water	520	
	Pump House	520	
	Well House	520	

Space Type	Description	Hours
Potable Water	Tank Shed	520
	Buried Storage Reservoir	520
	Elevated Storage Reservoir	520
	Free Water Surface Storage Reservoir	520
Potable Water Treatment	Chlorine Station	520
	Water Treatment Building	2080
Wastewater Treatment	Pump Station	520
	Wastewater Treatment Plant	2912

Space Type	Description	Hours
Exterior	Exterior	4368

Operation and Maintenance Savings

As part of the IGA, McClure Company has identified additional savings in operation and maintenance at select sites through implementation of the detailed scope of work. These savings are agreed upon by McClure and DCNR and shown throughout the cashflow for the life of the project. Breakouts of the annual O&M savings are detailed below. Upon final acceptance of this project, the below values will be accepted as the final savings requiring no additional verification. No escalation has been applied to the O&M savings, and no regular labor burden has been included. The total annual Mechanical O&M savings is \$62,805 per year. Lighting O&M savings total \$36,223 per year for a total O&M annual savings of \$99,028.

Boiler, Furnace, and HVAC Upgrades – based on historical data, a value of \$300 per piece of equipment per year has been applied to cover failing equipment requiring procurement of parts, outside services, or overtime for DCNR staff. This is considered an average burden per piece of equipment. In total, approximately 90 pieces of equipment are included, totaling \$27,000 per year.

Domestic Water Heaters – based on historical data, a value of \$100 per piece of equipment per year has been applied to cover failing equipment requiring procurement of parts, outside services, or overtime for DCNR staff. This is considered an average burden per piece of equipment. In total, approximately 99 pieces of equipment are included, along with (5) pieces of HVAC equipment at Greenwood Furnace at \$300 per piece, totaling \$11,300 per year.

Electric Resistance Heating Replacement- based on historical data, a value of \$100 per building per year has been applied to cover failing equipment. For cottages and yurts, \$50 has been applied. In total there are approximately 98 instances totaling \$7,350 per year.

Sinnemahoning Visitor Center Geothermal – in conversation with site staff, between \$2,000-\$5,000 per year is spent on leaks or system repairs as related to the geothermal wellfield. To remain conservative, McClure has elected to include \$3,500 per year as the O&M savings.

Parker Dam State Park Natural Gas Conversion – the park has recurring issues with natural gas service, resulting in approximately \$1,905 of overtime and repairs annually.

Blue Knob State Park Cabin HVAC – the cabins utilize heat pumps for cabin conditioning, that requiring significant repairs or replacements. Similar to the Boiler, Furnace, and HVAC values above, McClure has used \$300 per piece of equipment per year, for the 5 units, totaling \$1,500 per year.

Prince Gallitzin State Park Cabin Crawlspace Dehumidification – the cabins utilize residential dehumidifiers to maintain conditions within the cabin crawl spaces that will no longer be required based on the proposed scope. Expecting a 2-year cycle before the equipment requires replacement at \$50 per unit, McClure has included savings of \$250 per year for the dehumidifiers.

Mount Pisgah State Park Wastewater Treatment Plant – the site currently utilizes a wastewater treatment plant, however, as part of the above scope, it will be replaced with an on-lot style system. While the energy savings for decommissioning the plant are included with the scope, additional O&M savings will be realized in removing the plant from service. These O&M savings have been conservatively estimated for this report at \$10,000 per year based on discussions with DCNR staff.

Lighting – as a result of replacing fixtures and tubes, through warranties and expected burn hours through the life of the retrofit equipment, McClure has included annual warrant savings of \$36,223 through the life of the contract.

ACT 129

No ACT 129 savings have been included at this time. A majority of the sites are served by Rural Energy Cooperatives/Alliances (REC/REA) which are not required to offer ACT 129 rebate programs. For sites that would qualify for ACT 129 savings, McClure will submit on behalf of DCNR. The rebates will be assigned to McClure and once received will either be used as additional contingency or to reduce the cost of the project at the direction of DCNR.

ACT 179D

As a result of McClure’s proposed scope of work, certain annual federal tax deductions under Section 179D may be available to McClure as the certified designer for the project.

DCNR and DGS agree to cooperate with McClure by completing the written allocation and declaration required by Section 179D related to the scopes of work implemented under the contract.

McClure will prepare and is responsible for the declaration and all necessary documentation for DCNR/DGS signature. McClure will be the singled designated party listed as the certified designer of the project and in turn, will be the single party to which the deduction is allocated.

M&V Costs and Duration

As requested during the IGA, this M&V plan will be implemented for the first three years following installation of the scope of work. Completion of the three years of M&V will satisfy the contractual obligation for savings verification, which will be projected through the life of the contract. At any time, DCNR and DGS, at their discretion, may choose to stop additional measurement and verification efforts understanding savings have been met and are projected through the remaining contract years at the agreed upon escalation. DCNR and DGS understand and agree that if, for any reason, they cancel or terminate M&V services, fail to pay for services, fail to fulfil any responsibility necessary for McClure to provide the M&V services, or otherwise cancels or terminates the services, the guarantee shall be terminated and McClure will have no liability to continue to meet requirements.

The amount for the M&V services is as follows and will be billed with the delivery of the M&V report.

- Year 1- \$22,000
- Year 2- \$22,660
- Year 3- \$23,340

The M&V Report will include an “Acknowledgement and Acceptance” form. In the event the results show that the guaranteed savings have been satisfied, each party shall execute the Acknowledgement and Acceptance Form. The Client shall have (60) days to execute and return the Acknowledgement and Acceptance Form to McClure. After (60) days, and without further communication in writing from the Client, the M&V Report shall be considered accepted and conclude all further M&V Reporting obligations.

5. Commissioning, Preventive Maintenance, & Training

Commissioning

McClure has a specific methodology for commissioning this project as clearly described below. McClure’s team will develop commissioning specifications and complete a commissioning report at the end of the project. Below is a summary of each phase.

Final Design: During the design phase, McClure will collect and document owner project requirements and recommendations for basis of design. McClure will develop a commissioning plan and systems operation and maintenance manual, which will provide a “living document” and will become the basis of the final commissioning report.

Project Meetings: McClure will maintain a database of project meeting minutes to ensure that project progress is clearly documented and a timeline for addressing concerns and comments is actively recorded. Project meeting minutes will be circulated within the project construction team in a timely manner after each meeting.

Submittal Review: During the submittal review process, McClure will identify and revise any changes to the commissioning plan based on the final approved materials, equipment and systems. McClure will include submittals, progress reports, shop drawings, installation and O&M manuals in the plan.

Construction/Acceptance Test Phase: During construction, McClure will document and compile startup and check lists, pre-functional tests, functional test, and integrated system tests. Utilizing this information, McClure will assemble a final commissioning report along with training. McClure will present all equipment start-up forms, ATC as-built documentation, functional test reports and training records in a separate O&M volume 2 in line with internal commissioning protocol.

In addition, each measure will undergo one of three levels of commissioning, each with specific requirements and deliverables. While much more complex, the overview of these levels is as follows, with each level including the necessary documentation from the previous level:

- Level 1 - System Readiness and Start-Up; a basic inspection of the equipment to ensure the contractual obligations have been met, including equipment specific specification and warranty data
- Level 2 - Initial Operation; a pre-start check out and test of the equipment to ensure required components are functioning properly. Equipment specific, detailed start up sheets become an addition to the Level 1 documentation
- Level 3 - Functional System Test; the most rigorous commissioning level, this includes full performance testing of the equipment to verify it operates as designed and provides the necessary levels of operation based on actual environmental parameters. Included with the Level 1 & 2 documentation is a granular level document indicating specific operation of the equipment including the environmental conditions.

Below is the commissioning plan for the general energy conservation measure proposed.

General Scope	Commissioning Level
LED Lighting	1
Building Envelope	1
Roofing Upgrades	1
Window Upgrades	1
Garage Door Upgrades	1
Storage Upgrades	1
HVAC System Upgrades	2
DHW System Upgrades	2
Boiler/Furnace Upgrades	2
Controls/Recommissioning	3
Residence HVAC/Boiler/DHW	2
Cabin HVAC	3
Cottage/Yurt Heating	2
Shower House DHW Upgrades	2
Restroom DHW Upgrades	2
Water Conservation	1
Solar Vent Fan	1
Gas Well/Alternate Fuel Source	2
Underground Utility Replacement	1
EV Charging Station	2
On Lot Sewage System Upgrades	1

LED Lighting – as built records and O&Ms for installed equipment

Building Envelope – visual inspection of completed work with post-construction as built records

Building Envelope, Roofing Upgrades, Window Upgrades, Garage Door Upgrades, Storage Upgrades, Water Conservation, Underground Utility Replacement, On Lot Sewage System Upgrades – visual inspection of completed work with post-construction as built records

HVAC System Upgrades, DHW System Upgrades, Boiler/Furnace Upgrades, Residence HVAC/Boiler/DHW, Cottage/Yurt Heating, Shower House DHW Upgrades, Restroom Upgrades, Gas Well/Alternate Fuel Source, EV Charging Station – functional testing of select (>10%) installed HVAC equipment at facilities, based on scope of work and other post-construction activities, includes start up documentation

Cabin HVAC– full functional testing of installed HVAC equipment including checkout of new controls for select equipment (>10%).

The commissioning costs are included in the project. The final commissioning report will serve as a reference and benchmark document for future re-commissioning of each facility. The commissioning supervisor assures the design updates to the As-Built drawings have been completed.

Preventive Maintenance and Emergency Services

In accordance to PA Department of General Services (DGS) original Request for Quotation (RFQ) for A Guaranteed Energy Savings Project specifying that “*There will not be a service contract*” (Section 2.6 Energy Conservation Measures/Cost Submission), McClure has not included any Preventive Maintenance services programs, and/or associated costs for such services, with this GESA program at this time. However, as specified by the original RFQ, costs associated with McClure conducting the requisite Measurement and Verification (M&V) program services over a three-year term (Years 1-3 post-construction) are included. McClure’s annual fees for these M&V services are:

- Year 1: \$22,000
- Year 2: \$22,660
- Year 3: \$23,340

It is anticipated that DCNR will incorporate newly installed systems and technology into its preventative maintenance routines and annual operating obligations. McClure’s project management team will be available to assist the Commonwealth with operational and maintenance procedures, as well as warranty claims and repair work. Project training will be coordinated and scheduled with DCNR during the construction period.

In order for McClure to guarantee the energy savings projected, the Commonwealth shall maintain all equipment installed in a manner consistent with the manufacturer’s recommended maintenance schedules and procedures. The Commonwealth acknowledges and consents to McClure’s right to monitor energy conservation measure cost savings and energy management performance by conducting onsite measurements, including but not limited to, reading meters and installing and observing onsite monitoring equipment.

McClure Company is a full-service design/build mechanical contractor, construction, and energy service company. Upon request from the Commonwealth, McClure can develop a customized service support program for the DCNR GESA program. Under this Program, McClure Company will supplement DCNR’s maintenance staff and capability by providing bi-annual visits to perform preventive maintenance type services on the newly installed systems, such as the central mechanical, HVAC, and control equipment. This includes boiler/furnace and chiller plants where applicable.

We have a mechanical service division that employs professionally trained and certified service technicians; ready and capable of professionally servicing DCNR systems throughout the Commonwealth. We are able to service, troubleshoot and repair HVAC equipment ranging from simple air handling units to complex central plant systems. Having 24-hour emergency service is an important element to performance contracting as we are not reliant on subcontractors to respond to a situation and assures our clients of reliable and efficient operation over the long-term.

Our service program includes single-source control service support. Because of the Commonwealth’s preference of an open protocol automation system, DCNR can leverage multiple vendors to service their systems. McClure Company will act as the manager of the control system service and will dispatch the service provider best suited for application. This support would be included under a McClure Service Support Program following expiration of the warranty.

Training Program

McClure Company will train the current DCNR staff to properly and safely operate, utilize, monitor, and maintain the newly installed systems. This is a critical component of the GESA program as it ensures the persistence of guaranteed savings over the long-term. McClure will customize its training program for DCNR’s identified staff based upon all newly installed equipment, systems and technology and each sites level of need. The Training Program will commence post-construction of the work-scope, during the Commissioning process, which includes participation by DCNR staff, and continues with scheduled training sessions over the contract term. Training sessions will be coordinated and held in a classroom setting at DCNR locations and will include a review of O&M manuals from the Original Equipment Manufacturer (OEM) and as-built drawings. These sessions may be held jointly with sites located within reasonable

distance to minimize the impact to staff time. In addition, direct hands-on training will be provided on each Energy Conservation Measure (ECM), such as new HVAC, boiler/furnace systems, mechanical, electrical / lighting, EV charging stations, plumbing, building automation controls, and water conservation measures as necessitated by review of scope with site staff. Videotape of the training sessions may also be provided for future training use by DCNR and will require advance notice to occur. Upon completion of each training session, Certificates will be issued to DCNR staff demonstrating their understanding of the proper operation, maintenance, and monitoring of the newly installed systems. Re-training of DCNR staff may be provided by McClure as needed or requested over the contract term.

Training is a necessary part of project closeout process and throughout the life of the contract. McClure Company, through our own employees or through coordination with the appropriate sub-contractor, will provide a qualified instructor for training to DCNR staff on newly installed systems and technology. While additional resources for training may be available at off-site locations, which may or may not be incorporated, the anticipated training plan for DCNR personnel is to provide all training on site, whether specifically or jointly located. On-site training allows the decision on who attends any particular training session to be made by the proper manager from the DCNR organization. For each training session, McClure places no limitation on the number of personnel allowed to attend any training class. Training curricula, program, and materials will be customized for each technology and ECM type as necessitated by review of scope with site staff. McClure will furnish DCNR with a training program outline and all associated instructional materials in advance of all scheduled training sessions.

Initial training will include a review of each measure implemented, from controls to equipment and complete systems. This review will include an explanation of the energy savings expected with each system, a description of the construction that was included to achieve the savings, and most important, the expected operation of the new equipment. Training will include an overview of the energy savings methodology, the expected operation of the new equipment, safety protocols, and the general construction scope. An emphasis on expected operation, safety, and maintenance of the equipment/technology will be a key focus of all training sessions.

Training is an important part of any construction project but even more important in a guaranteed energy savings project. To achieve long-term success in meeting the savings expectations, the in-house maintenance staff must be capable of operating the equipment, perform routine preventive maintenance tasks, and know what to do in an emergency. Upon completion, DCNR maintenance staff will have gained a greater understanding on how the equipment and technology was intended to operate to meet the energy savings goals of the GESA program.