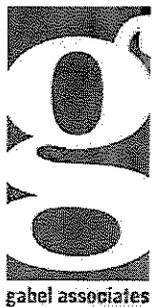

ASHRAE Level 2 Energy Audit
for
Blue Ridge Parkway
North Carolina, Virginia



Prepared for:
National Park Service Southeast Regional Office
100 Alabama Street SW
Building 1924
Atlanta, GA 30303



Audited on November 1-10, 2010
Auditor: Hector Leiva


MACTEC Engineering and Consulting, Inc.
In Conjunction with Gabel Associates, Inc.
MACTEC PROJECT # 6060090015.0007

Table of Contents

| | |
|--------------------|-----------------------------------------------------|
| SECTION 1.0 | PARK SUMMARY/OVERVIEW |
| 1.1 | General Park Information |
| 1.2 | Building Descriptions |
| SECTION 2.0 | UTILITY DATA |
| SECTION 3.0 | RENEWABLE PROJECT OPPORTUNITIES |
| SECTION 4.0 | SUSTAINABILITY EVALUATIONS |
| SECTION 5.0 | COMMISSIONING CANDIDATES |
| SECTION 6.0 | BUILDINGS REQUIRING METERS AND METERING PLAN |
| SECTION 7.0 | ENERGY CONSERVATION PROJECTS |
| | |
| APPENDIX A | UTILITY BILL ANALYSIS |
| APPENDIX B | ECP CALCULATIONS |
| APPENDIX C | PHOTOGRAPHS |
| APPENDIX D | SUSTAINABILITY ASSESSMENT |
| APPENDIX E | METER DATA AND EQUIPMENT INVENTORY |

Table of Contents (continued)

List of Acronyms and Abbreviations

| | |
|-----------------|---------------------------------------------------|
| % | percent |
| AHU | air handling unit |
| Btu | British thermal unit |
| CFL | compact fluorescent lamp |
| CMU | concrete masonry unit |
| CO ₂ | carbon dioxide |
| CRV | current replacement value |
| db | dry bulb |
| deg F | degrees Fahrenheit |
| DDC | direct digital controls |
| DOI | Department of the Interior |
| dTh | dekatherms or ten therms |
| DX | direct-expansion refrigeration |
| ECP | energy conservation project |
| EERC | energy efficient retrocommissioning |
| EISA | Energy Independence and Security Act |
| ERU | energy recovery unit |
| EUI | energy use index |
| fc | foot-candle |
| gpm | gallons per minute |
| HID | high-intensity discharge |
| hp | horsepower |
| HVAC | heating, ventilating, and air conditioning |
| IESNA | Illuminating Engineering Society of North America |
| kgal | thousand gallons |
| kW | kilowatt |
| kWh | kilowatt hour |
| LED | light emitting diode |
| M&V | measurement and verification |
| MACTEC | MACTEC Engineering and Consulting, Inc. |
| MBH | thousand Btus per hour |
| MBtu | thousand Btus |
| MMBtu | million Btus |
| NA | not applicable |
| NPS | National Park Service |
| ppm | parts per million |

Table of Contents (continued)

List of Acronyms and Abbreviations (continued)

| | |
|-------|-------------------------------------------------|
| psi | pounds per square inch |
| PTAC | package terminal air conditioner |
| PV | photovoltaic |
| ROI | return-on-investment |
| RTU | roof-top (package) unit |
| sq ft | square feet |
| TES | thermal energy storage |
| VAV | variable air volume |
| VFD | variable frequency drive (variable speed drive) |
| wb | wet bulb |

Executive Summary

MACTEC Engineering and Consulting, Inc. (MACTEC) performed an energy audit and building component model simulation for representative facilities at the Blue Ridge Parkway for the National Park Service (NPS) to estimate energy savings from implementing recommended energy conservation projects (ECPs). The purpose of this project is to serve as the first step in the NPS's compliance with the Energy Independence and Security Act of 2007, the Executive Orders related to Energy and Water Conservation, and the Department of the Interior Memorandum of Agreement related to Sustainable Operations. To support this effort MACTEC identified opportunities for energy, water, natural gas, and dollar savings. MACTEC conducted a utility bill analysis, site investigation and data collection, facility modeling, and calculation of savings and costs associated with implementing identified ECPs.

The opportunities are presented in cascading order and assume that each recommended ECP is implemented. The cascading order presented assumes that a previous complementary ECP is performed which will affect the energy savings and costs of following ECPs.

Construction cost estimates and energy savings are based on experience at similar facilities. No hourly building simulation modeling or detailed engineering cost estimates were performed. A representative facility was modeled for the geographic area of the site, and results were extrapolated to form a reasonable basis for projected savings. Cost estimates are based on average costs from a combination of vendor quotes, RS Means, and readily available consumer products. Cost estimates assume that each ECP and complementary ECP is performed as a Park-wide project to take advantage of lower costs associated with economies of scale.

Results in this report are based on data provided by the NPS and savings are tabulated through a series of calculations. The recommendations and calculations in this report are intended to be used as identification of potential ECPs with cost estimates. The feasibility and design of the recommended ECPs will require additional effort during the follow-on phase of the project. The results presented are expected to be accurate within +/- 20%.

Major energy savings opportunities identified in this audit include the following:

- Lighting upgrades, including installing occupancy based controls and upgrading or replacing inefficient light fixtures, are estimated to save over **\$16,500** per year and improve lighting conditions for Park personnel and visitors.
- Heating, ventilation, and air conditioning (HVAC) upgrades, including winterizing minimally occupied seasonal buildings and re-programming or installing programmable thermostats, are estimated to save over **\$18,000** per year.

EXECUTIVE SUMMARY TABLE

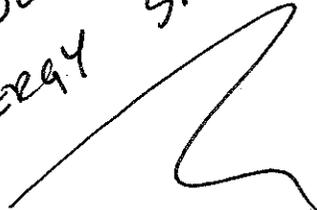
| | Total | | Gross as reported by NPS | |
|--------------------------------|-----------|------------|--------------------------|-------------|
| Square Footage | 664,741 | | | |
| | Current | After ECPs | Savings | % Reduction |
| Annual Electric Energy (kWh) | 851,956 | 551,601 | 300,355 | 35% |
| Annual Fuel Oil Energy (dTh) | 805 | 756 | 49 | 6% |
| Annual Water Usage (kGal) | 41,173 | 37,604 | 3,569 | 9% |
| 12-month MMBtu Used | | | | |
| *Includes electric & gas above | 3,644 | 2,570 | 1,074 | 29% |
| Annual Energy Cost (\$) | \$123,977 | \$74,939 | \$49,037 | 40% |
| Annual Water Cost (\$) | \$308,801 | \$282,033 | \$26,768 | 9% |
| Annual MBtu per sq ft | 5.481 | 3.866 | 1.616 | 29% |
| Annual Energy Cost per sq ft | \$0.19 | \$0.11 | \$0.07 | 40% |

Investment \$346,430
Simple Payback 4.57 years (includes water savings)

Note: Current usage data are based on utility data provided by the Park and has been adjusted for audited building usage. Buildings smaller than 1,000 square feet were not audited and do not affect the calculated energy savings. These smaller buildings still contribute to the overall after-ECPs Park usage.

Baseline 2003: Complete 2003 consumption data is not available. Only a sample of 2003 electric consumption was provided to MACTEC.

MOST CURRENT TECHNOLOGY (LED OR GREATER) TO BE USED TO MAXIMIZE ENERGY SAVINGS.



ECP Summary Table

| kWh Savings/Yr | kW Savings/Yr | Energy Conservation Project | Savings/Yr (MMBtu) | Savings/Yr (\$) | Cost (\$) | Payback (yrs) |
|----------------|---------------|-----------------------------------------------------------------------------------------|--------------------|-----------------|-----------|---------------|
| 39,266 | - | ECP 001: Replace Existing Aerator with Low-Flow Equivalent | 134.0 | \$9,914 | \$11,300 | 1.14 |
| 1,295 | - | ECP 002: Replace Existing Shower-Head with Low-Flow Equivalent | 4.4 | \$248 | \$700 | 2.82 |
| 0 | - | ECP 003: Replace Existing Water Closet with Low-Flow Equivalent | - | \$15,160 | \$39,500 | 2.61 |
| 0 | - | ECP 005: Replace Existing Urinal with Ultra Low-Flush Equivalent | - | \$7,348 | \$33,900 | 4.61 |
| 3,456 | - | ECP 009: Add Additional Insulation to Electric Hot Water Tank | 11.8 | \$503 | \$3,100 | 6.16 |
| 0 | - | ECP 010: Replace Missing or Repair Existing Pipe Insulation | 49.1 | \$410 | \$1,700 | 4.15 |
| 3,931 | 2.1 | ECP 018: Replace Existing Lighting with New LED Technology | 13.4 | \$822 | \$2,200 | 2.68 |
| 12,360 | 7.1 | ECP 020: Replace Existing High-Intensity Discharge Lighting with T8 Lighting Technology | 42.2 | \$2,049 | \$17,100 | 8.35 |
| 16,768 | 12.9 | ECP 022: Replace T12 Lamps with T8 Lamps and Electronic Ballast | 57.2 | \$2,670 | \$35,500 | 13.30 |
| 30,052 | 27.3 | ECP 023: Replace Incandescent Lamps with Compact Fluorescent Lamps | 102.5 | \$6,483 | \$8,200 | 1.26 |
| 7,909 | 0.8 | ECP 024: Install Wall-Mounted Occupancy Sensor | 27.0 | \$1,201 | \$3,900 | 3.25 |
| 12,946 | 7.4 | ECP 027: De-lamp and/or Replace Existing Lamps with Lower Lumen Lamps | 44.2 | \$1,924 | \$17,680 | 9.19 |
| 3,784 | 0.4 | ECP 029: Replace Exit Signs with Light Emitting Diode or Self-Illuminating Signs | 12.9 | \$1,591 | \$2,500 | 1.57 |
| 602 | 0.0 | ECP 032: Replace Existing Flood Fixture with Occupancy and Photo-cell Based Fixture | 2.1 | \$88 | \$350 | 3.99 |
| 15,692 | - | ECP 051: Increase the Life and Performance of Condenser Coils | 53.5 | \$2,993 | \$24,300 | 8.12 |
| 69,318 | - | ECP 052A: Install Programmable or Addressable Thermostat to Reduce Energy Consumption | 236.5 | \$10,087 | \$73,100 | 7.25 |
| 25,272 | - | ECP 052B: Install Programmable Thermostat to Reduce Heater Energy Consumption | 86.2 | \$3,678 | \$24,300 | 6.61 |
| 11,286 | - | ECP 052C: Winterize to Reduce Energy Consumption | 38.5 | \$1,702 | \$8,800 | 5.17 |
| 9,599 | 1.3 | ECP 092: Replace Existing Motors with Premium Energy-Efficient Motors | 32.8 | \$1,307 | \$12,000 | 9.18 |
| 9,060 | 0.6 | ECP 093: Reduce Energy Consumption of Refrigerators | 30.9 | \$1,588 | \$10,700 | 6.74 |

| kWh Savings/Yr | kW Savings/Yr | Energy Conservation Project | Savings/Yr (MMBtu) | Savings/Yr (\$) | Cost (\$) | Payback (yrs) |
|----------------|---------------|-----------------------------------------------------------------------|--------------------|-----------------|------------------|---------------|
| 4,674 | 0.2 | ECP 100: Reduce Energy Consumption of Vending Machines | 15.9 | \$680 | \$1,600 | 2.35 |
| 18,387 | 0.9 | ECP 101: Reduce Energy Consumption of Existing Window Air Conditioner | 62.7 | \$2,676 | \$14,000 | 5.23 |
| 287,734 | 61.1 | Total Package | 1,030.8 | \$73,909 | \$356,680 | 4.83 |

ECP 022 has a simple payback period of greater than 10 years. This ECP has been included in the summary and report because it is a feasible ECP and should be implemented because the existing technology is obsolete. Magnetic ballasts most commonly used for the operation of T12 lamps are no longer being produced for commercial and industrial applications. Also, many T12 lamps will be phased out of production starting July 2012. Standardizing facilities with fluorescent T8 lighting technology will reduce long-term maintenance costs because the Park only has to inventory one type of lamp and ballast.

| FMSS | | Building | | Square Feet | ECP/BUILDING MATRIX | | | | | | | | | | | | | | | | | | | | |
|--------|--------|----------|------------------------------------------------|-------------|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|---------|---------|---------|---------|
| Number | | | | | ECP 001 | ECP 002 | ECP 003 | ECP 005 | ECP 009 | ECP 010 | ECP 018 | ECP 020 | ECP 022 | ECP 023 | ECP 024 | ECP 027 | ECP 029 | ECP 032 | ECP 051 | ECP 052A | ECP 052B | ECP 092 | ECP 093 | ECP 100 | ECP 101 |
| 1 | 4866 | B822 | ETS Eng & Tech Services Office (Swain House) | 3,120 | X | | | | | | | | X | | | | | | | | | | | | |
| 2 | 4867 | B843 | Headquarters | 17,750 | X | | | | | | | X | X | | | | | | X | X | | | | | |
| 3 | 95184 | B980 | Destination Visitor Center | 15,000 | | | | | | | | X | X | | | | | | X | | | | | | |
| 4 | 4953 | B747 | Pump House - Socco Gap Maint/W43 | 72 | | | | | | | | | X | | | | | | | | | | | | |
| 5 | 116468 | B1063 | Haz Mat Bldg - Socco Gap MA | 120 | | | | | | | | | X | | | | | | | | | | | | |
| 6 | 4960 | B032 | Residence - Socco Gap | 1,510 | | | | | | | | X | X | | | | | | | | | | | | |
| 7 | 4961 | B149 | Residence/Davey House - Socco Gap | 3,264 | X | | | | | | | | X | | | | | | | | | | | | |
| 8 | 4952 | B437 | Visitor Center/Waterrock Knob | 1,270 | X | | | | | | | | | | | | | | | | | | | | |
| 9 | 11279 | B940 | Pump House & Well - Waterrock Knob | 120 | | | | | | | | | X | | | | | | | | | | | | |
| 10 | 4945 | B907 | Well House - Balsam Gap Maint/W42 | 78 | | | | | | | | | | | | | | | | | X | | | | |
| 11 | 4946 | B036 | Maintenance - Balsam Gap Maint | 5,261 | X | | | | | | X | X | | | | | | | | | | | | | X |
| 12 | 116467 | B1062 | Haz Mat Bldg - Balsam Gap MA | 120 | | | | | | | | | X | | | | | | | | | | | | |
| 13 | 4959 | B431 | Ranger Office - Balsam Gap Maint | 1,411 | X | | | | X | | | | X | | | | | | | X | | | | | |
| 14 | 4949 | B731 | Vehicle Storage - Balsam Gap Maint | 1,920 | | | | | | | | | | | | | | | | | | | | | |
| 15 | 4947 | B750 | Interpretive Office/Storage - Balsam Gap Maint | 480 | X | | | | | | | | | | | | | | | | | | | | |
| 16 | 11278 | B939 | Meter & Press. Tank House-Balsam Gap MA | 75 | | | | | | | | | X | | | | | | | | | | | | |
| 17 | 12872 | B955 | Haz Mat Storage - Balsam Gap Maint | 95 | | | | | | | | | X | | | | | | | | | | | | |
| 18 | 100571 | B982 | Balsam Wash Rack | 300 | | | | | | | X | | | | | | | | | | | | | | |
| 19 | 4958 | B430 | Residence - Balsam Gap Maint | 1,411 | | | | | | | | | X | | | | | | | | | | | | |
| 20 | 108248 | B987 | Haz Mat Bldg - Wagon Road MA | 80 | | | | | | | | | X | | | | | | | | | | | | |
| 21 | 4943 | B402 | Maintenance Bldg Wagon Road Gap | 916 | | | | | | | | | X | | | | | | | | | | | | |
| 22 | 4868 | B243 | Comfort Station (PA) - Mt Pisgah | 384 | X | | | | | | | | | | | | | | | | | | | | |
| 23 | 4869 | B748 | Pump House (CG)-Mt Pisgah/W46-C Loop | 64 | | | | | | | | | | | | | | | | | | | | | |
| 24 | 6384 | B810 | Office & Lab - Mt. Pisgah Sewer Plant | 234 | | | | | | | | | | | | | | | | | | | | | |
| 25 | 109703 | B988 | Well House | 48 | | | | | | | | | | | | | | | | | | | | | |
| 26 | 4884 | B867 | Kiosk - Mt Pisgah Campground | 160 | | | | | | | | | | | | | | | | | | | | | |
| 27 | 4875 | B244 | Comfort Sta (CG) - Mt Pisgah-A Loop | 384 | X | | | | | | | | | | | | | | | | | | | | |
| 28 | 4876 | B245 | Comfort Sta (CG)-Mt Pisgah-Low G Loop | 384 | X | | | | | | | | | | | | | | | | | | | | |
| 29 | 4877 | B246 | Comfort Sta (CG)-Mt Pisgah-Up C Loop | 384 | X | | | | | | | | | | | | | | | | | | | | |
| 30 | 4878 | B496 | Comfort Sta (CG)-Mt Pisgah - A Loop | 384 | X | | | | | | | | | | | | | | | | | | | | |
| 31 | 4883 | B530 | Comfort St (CG)-Mt Pisgah - Loop B | 384 | X | | | | | | | | | | | | | | | | | | | | |
| 32 | 4894 | B828 | Residence/Log Cabin - Mt Pisgah CG | 901 | | | | | X | | | | | | | | | | | | | | | | |
| 33 | 116466 | B1061 | Haz Mat Bldg - Oteen MA | 120 | | | | | | | | | | | | | | | | | | | | | |
| 34 | 4858 | B479 | Office/Shops/Firehouse-Oteen Maint | 12,635 | X | | | | X | | X | X | X | X | X | X | | | | | | | | X | X |
| 35 | 4863 | B181 | District Office - Oteen | 1,763 | | | | | | | | X | X | X | X | X | | | | | | | | X | X |
| 36 | 4891 | B182 | Storage Building - Oteen Maint | 1,411 | X | | | | | | | | | | | | | | | | | | | | |
| 37 | 4892 | B412 | Excelsior Plant Team Office Oteen Maint | 1,411 | X | | | | | | | | | | | | | | | | | | | | |
| 38 | 4865 | B755 | Oteen Warehouse & Archives Stor-VA | 7,560 | | | | | | | | X | X | X | X | X | | | | | | | | | |
| 39 | 86422 | B969 | Haz. Mat Storage Bldg - Oteen | 96 | | | | | | | | | | | | | | | | | | | | | |
| 40 | 4893 | B413 | Residence - Oteen Maint | 1,411 | X | | | | X | | | | | | | | | | | | | | | X | |

| Number | FMS# | Building | Square Feet | ECP 001 | ECP 002 | ECP 003 | ECP 005 | ECP 009 | ECP 010 | ECP 018 | ECP 020 | ECP 022 | ECP 023 | ECP 024 | ECP 027 | ECP 029 | ECP 032 | ECP 051 | ECP 052A | ECP 052B | ECP 062 | ECP 092 | ECP 093 | ECP 100 | ECP 101 |
|--------|--------|-------------------------------------------------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|---------|---------|---------|---------|---------|
| 41 | 4848 | B360 Visitor Center-Craggy Gardens | 1,525 | | | | | | | | | | | | | | | | | | | | | | |
| 42 | 4846 | B882 Well House (PA) - Craggy Gardens | 114 | | | | | | | | | | | | | | | | | | X | | | | |
| 43 | 4769 | B419 Well House - Crabtree Meadows (CG) | 80 | | | | | | | | | | X | | | | | | | | | | | | |
| 44 | 94430 | B975 Pumphouse-Crabtree Campground Water System | 25 | | | | | | | | | X | | | | | | | | | | | | | |
| 45 | 4764 | B129 Comfort Station (CG) - Crabtree Mead | 328 | X | | | | | | | | | | | | | | | | | | | | | |
| 46 | 4765 | B130 Comfort Station (CG)-Crabtree Meadow | 328 | X | | | | | | | | | | | | | | | | | | | | | |
| 47 | 4766 | B132 Comfort Station (CG)-Crabtree Meadow | 328 | X | | | | | | | | | | | | | | | | | | | | | |
| 48 | 4846 | B882 Well House (PA) - Craggy Gardens | 70 | | | | | | | | | | X | | | | | | | | | | | | |
| 49 | 4779 | B832 Residence/Log Cabin -Crabtree Meadow | 912 | | | | | X | | | | | | | | | | | | | | | | | |
| 50 | 4752 | B027 Office & Shop - Gillespie Gap | 2,433 | | | | | | | | X | | | | | | | | | | | | | | X |
| 51 | 116465 | B1060 Haz. Mat Bldg - Gillespie Gap MA | 120 | | | | | | | | | | X | | | | | | | | | | | | |
| 52 | 4753 | B119 Minerals Museum Visitor Center | 4,237 | | | | | | | | | | | | | | | X | X | | | | | | |
| 53 | 4754 | B121 Iterp Office & Stor - Gillespie Gap | 2,816 | | | | | | | | | | X | | | | | | | X | | | | | |
| 54 | 4755 | B122 Fire Cache & Stor-Gillespie Gap Main | 2,917 | | | | | | | | X | | | | | | | | | | | | | | |
| 55 | 4757 | B123 Auto Shop - Gillespie Gap Maint | 1,786 | | | | | | | X | | | | | | | | | | | | | | | |
| 56 | 4758 | B125 Sm. Equip Storage - Gillespie Gap | 221 | | | | | | | | X | | | | | | | | | | | | | | |
| 57 | 4759 | B135 Office - Gillespie Gap | 1,411 | X | | | | X | | | | | | | | | | X | X | | | | | | X |
| 58 | 4761 | B879 Well House - Gillespie Gap Maint | 72 | | | | | | | | | | | | | | | | | X | | | | | |
| 59 | 4778 | B136 Residence - Gillespie Gap | 1,411 | | | | | X | | | | | | | | | | X | X | | | | | | X |
| 60 | 116566 | B1068 Haz Mat Bldg | 99 | | | | | | | | | | | | | | | | | | | | | | |
| 61 | 4744 | B794 Visitor Center - Linville Falls/W33 | 824 | | | X | X | | | | | | X | X | | | | | | X | | | | | |
| 62 | 4751 | B880 Well House-Camp Ck Linville Falls | 100 | | | | | | | | | | | | | | | | | X | | | | | |
| 63 | 4747 | B449 Pump House - Linville Falls Qtr./W35 | 73 | | | | | | | | X | | X | | | | | | | X | | | | | |
| 64 | 4743 | B363 Comfort Station (CG) - Linville Fall | 377 | X | | | | | | | | | | | | | | | | | | | | | |
| 65 | 4777 | B418 Residence - Linville Falls | 1,411 | X | | | | X | | | | | X | X | | | | | | X | | | | | X |
| 66 | 4775 | B591 Maint Building Barn#1-Linville Fall | 1,397 | | | | | | | | | | | | | | | | | | | | | | |
| 67 | 4750 | B664 Kiosk (CG) - Linville Falls | 70 | | | | | | | | | X | X | | | | | | | | | | | | |
| 68 | 4746 | B436 Comfort Station (CG) - Linville Fall | 377 | X | | | | | | | | | | | | | | | | | | | | | |
| 69 | 4596 | B819 Fuel Containment/Storage - Linn Cove | 200 | | | | | | | | | | X | | | | | | | | | | | | |
| 70 | 4597 | B820 Pump House - Linn Cove /W48 | 100 | | | | | | | | | | X | | | | | | | | | | | | |
| 71 | 4598 | B842 Visitor Center - Linn Cove | 1,490 | | | | | | | | | X | | | | | | | | | | | | | |
| 72 | 4599 | B811 Generator Bldg - Linn Cove | 265 | | | | | | | | | | X | | | | | | | | | | | | |
| 73 | 4584 | B361 Comfort Station Loop A (CG) - Price Park | 213 | | | | | X | | | | | | | | | | | | | | | | | |
| 74 | 4614 | B545 Residence/Log Cabin - Price CG | 936 | X | | | | X | | | | | | | | | | | | | | | | | |
| 75 | 4594 | B841 Kiosk - Price Park | 70 | X | | | | | | | | | | X | | | | | | | | | | | |
| 76 | 4593 | B833 Amphitheater - Price Park | 120 | | | | | | | | | | | | | | | | | | | | | | |
| 77 | 4603 | B205 Horse Stable/Carriage Barn-Cone Park | 2,092 | | | | | | | | | X | | | | | | | | | X | | | | |
| 78 | 4604 | B208 Apple Barn - Cone Park | 5,491 | | | | | | | | | | | | | | | | | | | | | | |
| 79 | 4805 | B359 Flat Top/Cone Manor - Cone Park | 13,795 | | | | | | | X | | | | | | | | | | | | | | | |
| 80 | 17412 | B957 Well House - Cone Park | 100 | | | | | | | | | | | | | | | | | | | | | | X |

| Number | FMS | Building | Square Feet | ECP 001 | ECP 002 | ECP 003 | ECP 005 | ECP 009 | ECP 010 | ECP 018 | ECP 020 | ECP 022 | ECP 023 | ECP 024 | ECP 027 | ECP 029 | ECP 032 | ECP 051 | ECP 052A | ECP 052B | ECP 052 | ECP 092 | ECP 093 | ECP 100 | ECP 101 |
|--------|--------|---------------------------------------------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|---------|---------|---------|---------|---------|
| 81 | 4577 | B406 Haz Mat Building - Sandy Flats Maint | 85 | | | | | | | | | | | | | | | | | | | | | | |
| 82 | 4578 | B701 Maintenance Bldg - Sandy Flats Maint | 5,997 | X | | | X | X | | | | X | X | | | | | | | | | | | | X |
| 83 | 4741 | B824 Preservation Workshop | 2,898 | X | | | | | X | | | X | | | | | | | | | | | | | |
| 84 | 4610 | B204 Residence - Sandy Flats | 1,027 | X | | | | | | | | | | | | | | | | | | | | | |
| 85 | 4612 | B423 Residence - Sandy Flats | 1,411 | | | | | | | | | | | | | | | | | | | | | | |
| 86 | 4571 | B796 Pump House #1 - Jeffress Park/W27 | 168 | | | | | | | | | | | | | | | | | | | | | | |
| 87 | 4573 | B881 Well House #2 - Cascades | 144 | | | | | | | | | | | | | | | | | | | | | | |
| 88 | 4569 | B368 Maintenance Bldg - Berge Maint | 1,624 | | | | | | | | | | | | | | | | | | | | | | |
| 89 | 4484 | B813 Pump House - NW Trading Post/W25 | 64 | | | | | | | | | | | | | | | | | | | | | | |
| 90 | 4485 | B096 Birnagar Cabin | 502 | | | | | | | | | | | | | | | | | | | | | | |
| 91 | 4446 | B433 - Birnagar Outhouse | 27 | | | | | | | | | | | | | | | | | | | | | | |
| 92 | 4450 | B821 - Pump House/Low Notch/Dough Pk/W21 | 56 | | | | | | | | | | | | | | | | | | | | | | |
| 93 | 4451 | B099 Pump House Dough Pk/W22/Booster Pump | 245 | | | | | | | | | | | | | | | | | | | | | | |
| 94 | 4462 | B812 Pump House - Doughton Park Lodge/W22 | 56 | | | | | | | | | | | | | | | | | | | | | | |
| 95 | 4463 | B348 Pump House - Bluffs Maint/W23 Serv Rd | 88 | | | | | | | | | | | | | | | | | | | | | | |
| 96 | 4464 | B108 Office/Maint & Ranger - Bluffs Maint | 2,845 | X | | | | | | | | | | | | | | | | | | | | | |
| 97 | 4465 | B109 Carpenter & Paint Shop - Bluffs Maint | 1,792 | | | | | | | | | | | | | | | | | | | | | | |
| 98 | 4467 | B111 Gas & Oil Storage - Bluffs Maint | 217 | | | | | | | | | | | | | | | | | | | | | | |
| 99 | 4469 | B113 Shops & Fire Equip Stor - Bluffs Maint | 3,468 | | | | | | X | | | | | | | | | | | | | | | | X |
| 100 | 4471 | B369 Pump House - Bluffs Maint | 116 | | | | | | | | | | | | | | | | | | | | | | |
| 101 | 4472 | B378 Mill/Paint Shop - Bluffs Maint | 816 | | | | | | | | | | | | | | | | | | | | | | |
| 102 | 4478 | B884 Haz Mat Storage - Bluffs Maint | 55 | | | | | | | | | | | | | | | | | | | | | | |
| 103 | 4500 | B035 Residence - Bluffs | 1,556 | X | | | | | | | | | | | | | | | | | | | | | |
| 104 | 4498 | B830 Residence/Log Cabin - Doughton Park | 936 | X | | | | | | | | | | | | | | | | | | | | | |
| 105 | 4449 | B831 Kiosk - Doughton Park | 70 | | | | | | | | | | | | | | | | | | | | | | |
| 106 | 4441 | B094 Equip. Storage & Office - CKnob Main | 1,449 | | | | | | | | | | | | | | | | | | | | | | |
| 107 | 4435 | B092 Pump House CKnob (W20) | 100 | | | | | | | | | | | | | | | | | | | | | | |
| 108 | 4438 | B093 Gas & Oil Storage - CKnob Maint | 217 | | | | | | | | | | | | | | | | | | | | | | |
| 109 | 113013 | B1055 Haz Mat Storage - CKnob Maint | 72 | | | | | | | | | | | | | | | | | | | | | | |
| 111 | 4443 | B090 Visitor Center/Comfort Sta - CKnob | 813 | X | | | | | | | | | | | | | | | | | | | | | |
| 112 | 71041 | B958 Amphitheater - Fishers Peak | 3,000 | X | | | | | | | | | | | | | | | | | | | | | |
| 113 | 71042 | B959 Comfort Station - Fishers Peak | 970 | X | | | | | | | | | | | | | | | | | | | | | |
| 114 | 71043 | B960 Well House #1 - Fishers Peak | 21 | | | | | | | | | | | | | | | | | | | | | | |
| 115 | 71044 | B961 Well House #2 - Fishers Peak | 186 | | | | | | | | | | | | | | | | | | | | | | |
| 116 | 73225 | B962 Luthiers Shop - Fishers Peak | 728 | | | | | | | | | | | | | | | | | | | | | | |
| 117 | 93476 | B974 Music Museum - Fishers Peak | 16,442 | | | | | | | | | | | | | | | | | | | | | | |
| 118 | 6505 | B867 Ranger Office (Hipp Dwelling) | 1,915 | X | | | | | | | | | | | | | | | | | | | | | |
| 119 | 115464 | B1059 Haz Mat Bldg - Fancy Gap MA | 120 | | | | | | | | | | | | | | | | | | | | | | |
| 120 | 6502 | B364 Maintenance Bldg - Fancy Gap | 1,667 | X | | | | | | | | | | | | | | | | | | | | | |

| Number | FMSS | Building | Square Feet | ECP 001 | ECP 002 | ECP 003 | ECP 005 | ECP 009 | ECP 010 | ECP 018 | ECP 020 | ECP 022 | ECP 023 | ECP 024 | ECP 027 | ECP 029 | ECP 032 | ECP 051 | ECP 052A | ECP 052B | ECP 052 | ECP 093 | ECP 100 | ECP 101 |
|--------|--------|-------------------------------------------------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|---------|---------|---------|---------|
| 121 | 6504 | B865 Pump House - Fancy Gap Maint | 100 | | | | | | | | | | | | | | | | | | X | | | |
| 122 | 12883 | B946 Fuel Building - Fancy Gap | 60 | | | | | | | | | | X | | | | | | | | | | | |
| 123 | 6503 | B448 Pump House - Fancy Gap Residence/W19 | 60 | | | | | | | | | | X | | | | | | | | | | | |
| 124 | 6631 | B416 Residence - Fancy Gap Maint | 1,411 | X | | | | | | | | | X | | | | | | | | | | | |
| 125 | 6492 | B864 Pump House (PA) - Groundhog Mtn | 96 | | | | | | | | | | X | | | | | | | | X | | | |
| 126 | 6371 | B839 Mabry Mill Well #3/W47 - Restaurant | 100 | | | | | | | | | | | | | | | | | | X | | | |
| 127 | 6409 | B330 Mabry Mill | 1,296 | | | | | | | | | | | | | | | | | | | | | |
| 128 | 6410 | B331 Blacksmith Shop - Mabry Mill | 225 | | | | | | | | | | X | | | | | | | | | | | |
| 129 | 6374 | B805 Comfort Station - Mabry Mill | 560 | X | | | X | | | | X | | | | | | | | | | X | | | |
| 130 | 6375 | B806 Well House - Mabry Mill/W47 | 98 | | | | | | | | | | | | | | | | | | X | | | |
| 131 | 6423 | B007 Residence - Rocky Knob | 1,328 | X | | | | X | | | | | X | | | | | | X | | | | | |
| 132 | 5627 | B082 Visitor Center (PA) - Rocky Knob | 559 | X | | | | | | | | | | | | | | | | | X | | | |
| 133 | 5618 | B438 Comfort Sta (CG)/C Loop - Rocky Knob | 380 | X | | | | | | | | | | | | | | | | | | | | |
| 134 | 5619 | B439 Comfort Sta (CG)/B Loop - Rocky Knob | 380 | X | | | | | | | | | | | | | | | | | | | | |
| 135 | 5620 | B450 Comfort Sta (CG)/T Loop - Rocky Knob | 380 | X | | | | | | | | | | | | | | | | | | | | |
| 136 | 5621 | B451 Comfort Sta (CG)/A Loop - Rocky Knob | 380 | X | | | | | | | | | | | | | | | | | | | | |
| 137 | 5622 | B677 Information Bldg (CG) - Rocky Knob | 70 | | | | | | | | | | | | | | | | | | | | | |
| 138 | 5610 | B002 Warehouse Equip Stor-Rocky Knob/Maint | 3,591 | | | | | | | | | | X | | X | | | | | | X | | | |
| 139 | 5611 | B003 Carpenter Paint Shop-Rocky Knob/Maint | 2,691 | | | | | | | | X | | | | X | | | | | | | | | |
| 140 | 5612 | B004 Office & Tool Stor-Rocky Knob Maint | 1,898 | | | | | X | | | | | | | | | | X | | | | | | |
| 141 | 5613 | B005 Oil/Paint Storage - Rocky Knob Maint | 221 | X | | | | X | | | | | X | | X | | | | | | | | | |
| 142 | 5614 | B026 B026 Pump House - Rocky Knob Maint | 144 | | | | | | | | | | | | | | | | | | | | | |
| 143 | 5615 | B086 Shops & Heavy Equip-Rocky Knob Maint | 6,240 | | | | | | | | X | | X | | | | | | | | | | | |
| 144 | 6491 | B869 Interp Office (Relocated Young Dwelling B) | 1,243 | | | | | | | | | | | | | | | | | | | | | |
| 145 | 5623 | B836 Rocky Knob District Office | 1,675 | | | | | X | | | | | X | | | | | X | | X | | | | X |
| 146 | 5624 | B878 Chainsaw Bldg - Rocky Knob Maint | 117 | | | | | | | | | | | | | | | | | | | | | |
| 147 | 81668 | B965 Fuel Building - Rocky Knob MA | 42 | | | | | | | | | | | | | | | | | | | | | |
| 148 | 5630 | B010 Pump House - Rocky Knob PA | 138 | | | | | | | | | | | | | | | | | | | | | |
| 149 | 5641 | B863 Pump House - Rocky Knob Cabins | 30 | | | | | | | | | | | | | | | | | | | | | |
| 150 | 5539 | B377 Office/Stor/Shops/SignShop-Vinton MA | 9,229 | X | | | X | | X | | X | X | X | X | X | | | X | | X | | | | X |
| 151 | 5540 | B429 Ranger Office - Vinton Maint | 1,763 | X | | | X | | X | | X | X | X | X | | | | X | | X | | | | |
| 152 | 5541 | B506 Equipment Storage - Vinton Maint | 2,464 | | | | | | | | | | X | | | | | | | | | | | |
| 153 | 86419 | B966 Haz Mat Storage - Vinton Maint | 56 | | | | | | | | | | | | | | | | | | | | | |
| 154 | 5553 | B427 Residence Vinton Maint | 1,411 | | | | | | | | | | | | | | | | | | | | | |
| 155 | 5551 | B421 Residence - Vinton Maint | 1,411 | | | | | | | | | | | | | | | | | | | | | |
| 156 | 5552 | B422 Residence - Vinton Maint | 1,411 | X | | | X | | X | | X | X | X | X | | | | X | | X | | | | |
| 157 | 99973 | B979 Amphitheater Bldg - Roanoke Mtn CG | 288 | | | | | | | | | | | | | | | | | | | | | |
| 158 | 5220 | B055 Equipment Storage-Peaks of Otter Main | 2,683 | | | | | | | | | | | | | | | | | | | | | |
| 159 | 116463 | B1068 Haz Mat Bldg - Peaks of Otter Maint | 120 | | | | | | | | | | | | | | | | | | | | | |
| 160 | 5221 | B353 Gas/Oil House - Peaks of Otter Maint | 248 | | | | | | | | | | | | | | | | | | | | | |

| Number | FMSS | Building | Square Feet | ECP 001 | ECP 002 | ECP 003 | ECP 005 | ECP 009 | ECP 010 | ECP 018 | ECP 020 | ECP 022 | ECP 023 | ECP 024 | ECP 027 | ECP 029 | ECP 032 | ECP 051 | ECP 052A | ECP 052B | ECP 052 | ECP 092 | ECP 093 | ECP 100 | ECP 101 |
|--------|--------|---------------------------------------------------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|---------|---------|---------|---------|---------|
| 161 | 12553 | B732 Carpenter/Shop/Equip/Store-Peaks of Otter | 2,688 | | | | | | | | | X | X | X | | | | | | | | | | | |
| 162 | 5224 | B753 Office - Peaks of Otter Maint | 1,200 | X | X | X | | X | | | | X | X | | | | | X | X | | | | | | |
| 163 | 10205 | B935 Well House - Mons Well-Peaks of Otter | 54 | | | | | | | | | X | X | | | | | | | X | | | | | |
| 164 | 5229 | B058 Visitor Center - Peaks of Otter | 1,991 | X | | | X | | | | | X | X | | | | | X | X | | | | | | |
| 166 | 10206 | B936 Well House/Wells 2 & 3-Peaks of Otter | 175 | X | | | X | | | | | X | X | | | | | | | X | | | | | |
| 167 | 228033 | B392 Comfort Station (CG) - Peaks of Otter | 377 | X | | | | | | | | X | X | | | | | | | | | | | | |
| 168 | 228034 | B393 Comfort Station (CG) - Peaks of Otter | 377 | X | | | X | | | | | X | X | | | | | | | | | | | | |
| 169 | 5240 | B759 Kiosk (CG) - Peaks of Otter | 70 | | | | | | | | | | | | | | | | | | | | | | |
| 170 | 5249 | B752 Residence - Peaks of Otter | 1,168 | X | X | X | | X | | | | X | X | | | | | X | X | | | | | | |
| 171 | 5158 | B047 Mechanic Shop - James River Maint | 1,785 | | | | | | | | | X | X | | | | | | | | X | | | | |
| 172 | 5159 | B048 Carpenter/Store/Fire Catch - James River | 2,818 | | | | | | | | | X | X | | | | | | | | | | | | |
| 173 | 5160 | B049 Equipment Storage - James River Maint | 2,818 | | | | | | | | X | X | | | | | | | | | | | | | |
| 174 | 5161 | B050 Office & Employee Area - James River Maint | 1,194 | | | | | | | | X | X | X | | | | | X | X | | | | | | |
| 175 | 5163 | B053 James River Office | 1,411 | X | | | X | | | | | X | X | | | | | X | X | | | | | | |
| 176 | 116462 | B1057 Haz Mat Bldg - James River Maint | 120 | | | | | | | | | X | X | | | | | | | | | | | | |
| 177 | 5166 | B809 Well House - James River Maint/W7 | 59 | | | | | | | | | X | X | | | | | | | | | | | | |
| 178 | 5164 | B054 Residence - James River Maint | 1,411 | X | X | X | | | | | X | X | | | | | | X | X | | | | | X | |
| 179 | 5157 | B030 Visitor Ctr/Comfort Sta - James River | 1,152 | X | | | | | | | X | X | | | | | | X | X | | | | | | |
| 180 | 5156 | B803 Well House - Otter Creek/W5 | 64 | | | | | | | | | X | X | | | | | | | X | | | | | |
| 181 | 5151 | B308 Comfort Station (CG) - Otter Creek | 303 | X | | | X | | | | | | | | | | | | | | | | | | |
| 182 | 5152 | B309 Comfort Station (CG) - Otter Creek | 303 | X | | | X | | | | | | | | | | | | | | | | | | |
| 183 | 5153 | B758 Kiosk (CG) - Otter Creek | 400 | | | | | | | | | | | | | | | | | | | | | | |
| 184 | 5084 | B315 Haz Mat Building - Montebello MA | 120 | | | | | | | | | | | X | | | | | | | | | | | |
| 185 | 5085 | B169 Office - Montebello Maint | 1,411 | X | | X | | X | | | X | X | | | | | | X | X | | | | | X | |
| 186 | 5107 | B170 Office (former Residence) - Montebello Maint | 1,411 | X | X | X | | | | | X | X | | | | | | X | X | | | | | X | |
| 187 | 5086 | B171 Office/Storage/Shops-Montebello Maint | 8,773 | X | | | X | | | | X | X | | | | | | X | X | | | | | X | |
| 188 | 5087 | B173 Oil/Paint Storage - Montebello Maint | 992 | | | | | | | | | | X | | | | | | | | | | | | |
| 189 | 5088 | B175 Vehicle Storage - Montebello Maint | 7,226 | | | | | | | | | X | X | | | | | | | | | | | | |
| 190 | 5091 | B371 Ridge Dist Off-Montebello MA | 3,160 | X | | | | X | | | | X | X | | | | | X | X | | | | | | |
| 191 | 5090 | B343 Pump House - Whatstone Ridge/W4 | 62 | | | | | | | | | X | X | | | | | | | X | | | | | |
| 192 | 5105 | B404 Residence - Love Maint | 1,411 | X | X | X | | X | | | X | X | | | | | | X | X | | | | | X | |
| 193 | 5106 | B411 Residence - Love Maint | 1,411 | | | | | | | | | | | | | | | X | X | | | | | | |
| 194 | 5082 | B365 Maintenance Bldg - Love Maint | 1,120 | | | | | | | | | | X | | | | | X | X | | | | | | X |
| 195 | 10207 | B937 Pump House-Humpback Rocks PA | 49 | | | | | | | | | | X | | | | | | | | | | | | |
| 196 | 5077 | B269 Visitor Center - Humpback Rocks | 1,269 | X | | X | X | | | | X | X | | | | | | X | X | | | | | | |
| | | Pisgah District | | | | | | | | | | | | | | | | | | | | | | | |
| | | Highlands District | | | | | | | | | | | | | | | | | | | | | | | |
| | | Plateau District | | | | | | | | | | | | | | | | | | | | | | | |
| | | Ridge District | | | | | | | | | | | | | | | | | | | | | | | |

SECTION 1.0
Park Summary/Overview

SECTION 1.0 – PARK SUMMARY/OVERVIEW

1.1 General Park Information

Blue Ridge Parkway is located in North Carolina & Virginia. Pertinent information is provided below:

| | | |
|------------------------------------------|---------------------------------------|---------------------|
| Number of Buildings Audited: | 198 | |
| Square Footage Audited: | 287,139 | square feet (sq ft) |
| Total Square Footage: | 664,741 | sq ft |
| Operation Hours: | 7:00 A.M. - 5:00 P.M. Monday - Friday | |
| Park Hours: | 24/7 | |
| Year Designated as National Park: | 1935 | |
| Number of Employees: | 175 | |
| Seasonal Employees: | 200 | |
| Annual Visitors: | 20,000,000 | |
| Site Contact: | Debbie Northrop (828) 271-4779 x253 | |

1.2 Building Descriptions

There are 77 conditioned buildings, on the audit list, of greater than 1,000 sq ft. Many of these buildings are individually metered. Glazing is mainly double-pane, and lighting is a mixture of linear T12, T8, compact fluorescent and incandescent fixtures. Conditioning is primarily heat provided by boilers, gas and oil-fired forced air furnaces, along with electric and hot water space heaters. Controls are primarily manual thermostats or programmable thermostats that are not programmed correctly. At the time of the audit, some lights were observed to be on in areas that were unoccupied. A few remaining plumbing fixtures were observed to be standard flow type. A description of each building follows.

B974 Music Museum Fishers Peak is a visitor center which has offices, a meeting room, public restrooms, an interpretation area and a theater. At the time of the audit, the building was closed for the season to visitors and still conditioned. There are reportedly two permanent Park employees who work out of this facility in the winter. The entire 16,442 sq ft facility is conditioned for them and a few other part-time employees. Lighting is provided by T12 fluorescent and incandescent fixtures. Conditioning is provided by split-systems controlled by programmable thermostats which are not programmed correctly. An old, inefficient refrigerator was observed in the employee area.

B007 Residence - Rocky Knob, B032 Residence - Soco Gap, B035 Residence - Bluffs, B053 James River Office, B054 Residence - James River Maint, B135 Office - Gillespie Gap, B136 Residence - Gillespie Gap, B149 Residence/Davey House - Soco Gap, B169 Office - Montebello Maint, B170 Office (former Residence) - Montebello Maint, B182 Storage Building - Oteen Maint, B204 Residence - Sandy Flats, B404 Residence - Love Maint, B411 Residence - Love Maint, B412 Exotic Plant Team Office Oteen Maint, B413 Residence - Oteen Maint, B416 Residence - Fancy Gap

Maint, B418 Residence - Linville Falls, B421 Residence - Vinton Maint, B422 Residence - Vinton Maint, B423 Residence - Sandy Flats, B427 Residence Vinton Maint, B430 Residence - Balsam Gap Maint, B431 Ranger Office - Balsam Gap Maint, B752 Residence - Peaks of Otter are administrative, ranger, and seasonal housing facilities. Lighting is provided by T12 and T8 fluorescent along with incandescent fixtures. Exterior incandescent fixtures were observed to be on during the day. Conditioning is provided by split-systems controlled by manual thermostats and programmable thermostats which are not programmed correctly. No seasonal housing was observed to be winterized. Some units are only occupied two months each year.

B036 Maintenance - Balsam Gap Maint , B086 Shops & Heavy Equip-Rocky Knob Maint, B113 Shops & Fire Equip Storage-Bluffs Maint, B123 Auto Shop - Gillespie Gap Maint, B171 Office/Storage/Shops-Montebello Maint, B179 Office/Shops/Firehouse-Oteen Maint, B181 District Office - Oteen, B377 Office/Storage/Shops/Sign Shop-Vinton MA, B701 Maintenance Bldg - Sandy Flats Maint, B824 Preservation Workshop, are maintenance facilities. These facilities are occupied and operational year-round. The buildings contain private offices, workshops and vehicle bays that are lit by T12, T8 incandescent and high-intensity discharge (HID) fixtures. The buildings are conditioned by oil-fired hot water boilers controlled by manual and programmable thermostats. Cooling, where present, is provided by split-systems and package terminal air conditioners (PTACs). The hot water pipes in the concrete slabs in B171 and B113 are leaking and need to be replaced.

B048 Carpenter/Stor/Fire Cach- James River, B049 Equipment Storage - James River Maint, B094 Equip. Storage & Office - CKnob Main, B047 Mechanic Shop - James River Maint, B108 Office/Maint & Ranger - Bluffs Maint, B109 Carpenter & Paint Shop -Bluffs Maint, B122 Fire Cache & Stor-Gillespie Gap Main, B175 Vehicle Storage - Montebello Maint, B365 Maintenance Bldg - Love Maint, B366 Maintenance Bldg - Benge Maint, B506 Equipment Storage - Vinton Maint, B731 Vehicle Storage - Balsam Gap Maint, B732 Carpenter Shop/Equip Storage-Peaks of Otter are maintenance facilities. These facilities are occupied and operational year-round. The buildings contain private offices, workshops and vehicle bays that are lit by T12, T8 incandescent and HID fixtures. The buildings are heated by electric and propane and oil-fired furnaces controlled by manual and programmable thermostats and some facilities have electric baseboard heating with manual controls. Cooling is provided by PTACs.

B002 Warehouse Equip Storage-Rocky Knob Maint, B003 Carpenter Paint Shop-Rocky Knob Maint are maintenance and storage facilities. The buildings are lit by T12 and incandescent fixtures. Conditioning for these facilities is provided by the oil-fired hot water boiler in B086 and there is no cooling in these facilities. Some areas were observed to be over-lit. A manually controlled electric heater provides supplemental heat in B002.

B980 Destination Visitor Center is a Leadership in Energy and Environmental Design (LEED) Silver certified facility. Lighting is provided by T8 and incandescent fixtures. Conditioning is provided by a pulse-combustion hot water boiler, an energy recovery unit (ERU), and split-system heat pumps. All pump motors are controlled by variable frequency drives (VFDs).

B843 Headquarters is an office building that is scheduled to be recommissioned. The current zones are inefficient and difficult to control. The building is lit by T12 fixtures and occupancy of the private offices is intermittent. The private offices receive ample ambient light from windows. The building is conditioned by an oil-fired hot water boiler and a package unit. Water pumps are controlled by VFDs.

B004 Office & Tool Storage-Rocky Knob Maint, B867 Ranger Office (Hipp Dwelling), B822 ETS Eng & Tech Services Office (Swain House), B836 Rocky Knob District Office, B753 Office - Peaks of Otter Maint, B429 Ranger Office - Vinton Maint, B269 Visitor Center - Humpback Rocks, B119 Minerals Museum Visitor Center, B050 Office & Employee Area - James River Maint, B055 Equipment Storage-Peaks of Otter Main, B058 Visitor Center - Peaks of Otter, B030 Visitor Center/Comfort Station - James River are administrative, ranger, and interpretation/visitor center facilities. Lighting is provided by T12, T8 and incandescent fixtures. Conditioning is provided by split-systems controlled by manual thermostats and programmable thermostats which are not programmed correctly.

B842 Visitor Center - Linn Cove, B437 Visitor Center Waterrock Knob, B869 Interp Office (Relocated Young Dwelling B) are seasonal interpretation/visitor center facilities. Lighting is provided by incandescent fixtures and skylights. Conditioning is provided by PTACs and by propane-fired heating units controlled by manual thermostats. These facilities are winterized when not in use.

B371 Ridge Dist Office- Montebello is an administrative and ranger facility occupied year-round. Lighting is provided by T12 and incandescent fixtures. Conditioning is provided by split-systems controlled by programmable thermostats which are not programmed correctly. This facility was designed for summer use since the walls have no vapor barrier or insulation. Occupants complain of having to bring electric heaters to stay comfortable in the winter.

B027 Office & Shop - Gillespie Gap, B591 Maint Dellinger Barn#1-Linville Fall are maintenance facilities. The buildings are lit by T12 and incandescent fixtures. Conditioning is provided by oil-fired furnaces and PTACs.

B121 Interp Office & Storage - Gillespie Gap, B205 Horse Stable/Carriage Barn-Cone Park are interpretation facilities. The buildings are lit by T8 and incandescent fixtures. Some areas were observed to be over-lit. Conditioning is provided by electric unit heaters with manual thermostats.

B364 Maintenance Bldg - Fancy Gap is a maintenance facility. The building is lit by T12 and incandescent fixtures. Conditioning is provided by an electric unit heater. Exterior lighting was observed to be on during the day.

B359 Flat Top/Cone Manor - Cone Park is a historic structure occupied by a concessioner from April to October. The Park pays the utility bills for this facility during the rest of the year. The lighting consists of incandescent fixtures over display areas. The building is heated with baseboard electric heat. During the audit, the lighting in the administrative areas was observed to be on while unoccupied.

B958 Amphitheater - Fishers Peak is a stage used primarily on the weekends during the summer season. Lighting is provided by incandescent fixtures.

B755 Oteen Warehouse & Archives Storage-VA is a storage and administrative facility. Lighting is provided by T12 and incandescent fixtures. Conditioning is provided by split-systems and a gas unit heater in the warehouse. Temperature setpoints in the archive storage area are determined by artifact preservation requirements.