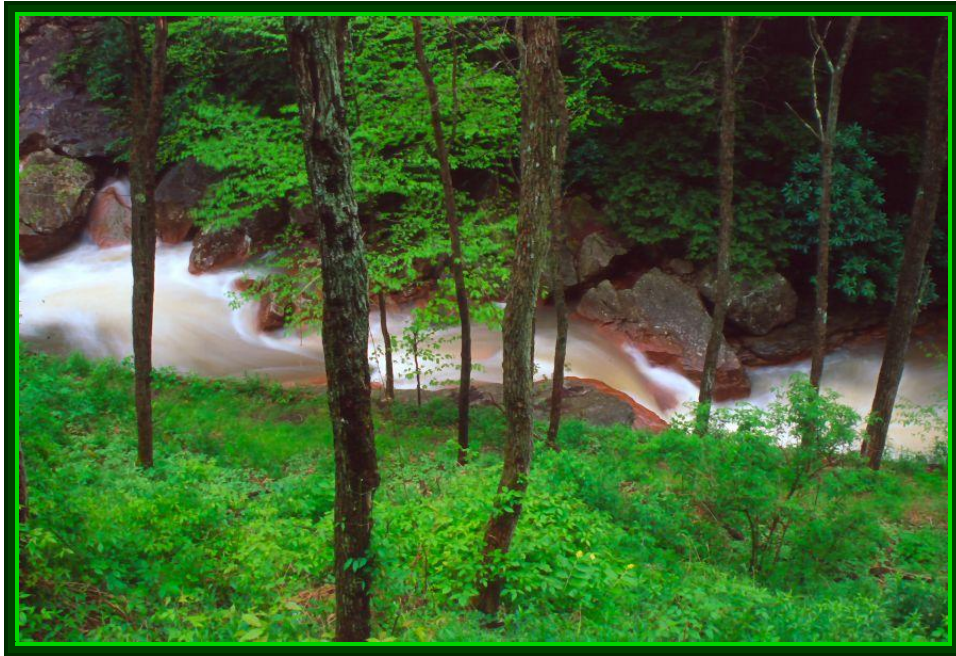


Monongahela National Forest Sustainability Action Plan

June 2008



Message from the Forest Supervisor:

In this time of climate change and anemic budgets, we all must do what we can to reduce our environmental footprint, lower energy costs, and be conservation leaders. To that end, I am issuing a challenge to the Supervisors Office and each Ranger District to reduce our energy use by five percent a year over the next three years. Two areas I am particularly interested in are: 1) our ability to lower energy consumption and carbon emissions through better use of conference calls, car-pooling, and other means; and 2) our ability to provide opportunities for local participation in our projects, purchases, and management needs. These opportunities can help stimulate local economies, while requiring less energy use and transportation costs. However, I also recognize the value of all the recommendations in this action plan, and I hope that we can use as many of them as possible to meet our conservation and sustainability goals. Over time these practices should become standard operating procedures as we see our Forest become more efficient, more environmentally friendly, and a conservation model to all.

Clyde N. Thompson

Introduction

The resources on our planet to sustain an ever-growing and consuming population are finite. The concept of sustainability means striking a balance among commercial interests, ecological impacts, and social/cultural desires. We need to be aware of our impact on the world and strive to meet our needs for the present without compromising the ability of future generations to meet their needs.

To be true to our mission, we must acknowledge the ecological, economic, and ethical impacts of our business operations. Worldwide there are only 4.5 biologically productive acres of land per person. A single person living in the United States requires, on average, 24 biologically productive acres to support her/his consumption. The earth currently has a population of 6.1 billion people, many of whom want to move toward a U.S. lifestyle. As members of an agency charged with stewardship and conservation leadership, and as global citizens, we need to recognize and address our level of consumption and our impacts on the earth's limited resources.

Beyond taking personal and global responsibility, there are also legal mandates for implementing sustainable measures to reduce our environmental footprint. These mandates include:

- The Energy Independence and Security Act of 2007 (Energy Act),
- The Energy Policy Act of 2005 (EPAct), and
- Executive Order 13423: Strengthening Federal Environmental, Energy, and Transportation Management (EO 13423).

This Sustainability Plan provides information and recommendations that the Forest can use to reduce its environmental footprint by conserving energy and water, recycling, and converting to more earth-friendly or “green” products and practices. Reductions in usage will not only have fewer impacts on the environment but will also be reflected in cost savings to the Forest, which in turn are savings to the government and its taxpayers, including each and every one of us. These savings can then be used to buy products or implement services and practices that will further reduce the environmental footprint of Forest employees and our customers.

This Plan is divided into seven key areas of conservation guidance and recommendations:

- 1) Energy Use,
- 2) Fleet and Fuel Efficiency,
- 3) Water Conservation,
- 4) Recycling and Waste Reduction
- 5) Green Purchasing,
- 6) Sustainability Leadership, and
- 7) Monongahela Internal Footprint Grant Program.

Each of the areas is divided into two sections, goals and guidance. The goals describe what we want to achieve and why we want to achieve it, and include any applicable requirements from law, order, or agency policy. The guidance sections provide lists of feasible actions that we can take, individually and as a unit, to move us toward our goals. Some of these actions are easy and can be applied right away; others will take more of a long-term effort and investment. Together they should all help us achieve our overall objective of reducing our environmental footprint. The Plan also includes appendices that provide additional sustainability references, options, and ideas.

Although this Plan lays down a firm foundation for enhancing sustainability, we also want it to be a dynamic and flexible document so that we can continue to improve our conservation measures as new ideas, techniques, and technologies become available over time.

Energy Use

Energy Use Goals (Eastern Region Draft)

Reduction of gas and coal-generated electrical energy use in Agency facilities will mitigate climate change, reduce smog, and reduce our dependence on non-renewable resources.

Applicable requirements:

- Reduce greenhouse gas emissions and/or energy use by 3% annually through 2015 or 30% by 2015 as compared to baseline numbers (Energy Act).
- By 2013, all general purpose lighting in federal buildings must be Energy Star or approved by the Federal Energy Management Plan (FEMP) (Energy Act).
- Federal agencies are required to designate managers to conduct analyses of energy and water used by 25% of the agency's buildings annually and recommend ways to conserve energy. Two years after the analysis is completed, the agency must implement the energy and water saving measures identified in the building evaluation (Energy Act).
- Explore renewable energy opportunities on agency property (EO 13423).
- Purchase Energy Star and FEMP recommended products for 95% of electronics (EO13423).
- 3% of energy purchases are from renewable sources by 2007 and 7.5% of energy purchases are from renewable sources by 2013 (EPAct).

Energy Use Guidance

- Shut down computers and other electrical devices that are not being used at night or on weekends. Unplugging electrical devices can save even more energy costs.
- Purchase "Kill-A-Watt" meter and use it to determine electric usage and identify potential energy-saving opportunities. Share meter with all district offices.
- Install heat-conserving blankets around water heaters and lower water temperature to 120 degrees.
- Continue replacing light bulbs with compact fluorescents. Focus on lights that are illuminated more than 400 hours annually.
- Use motion sensor plug strips (equipped with a fuse for safety purposes) in area/work stations where there is a mix of electrical needs (computer, desk lamp, adding machine, phone, etc.).
- Retrofit outdoor lighting with motion sensors. Continue to use low wattage bulbs compatible for outdoor use.
- Install automatic shut-off switches or occupancy sensors in areas frequently unoccupied.
- In facilities that have programmable thermostats, designate an employee to program thermostats to a daytime setting and an evening/weekend setting. In facilities that do not have programmable thermostats, install programmable thermostats or timers for evenings and weekends. Relocate those thermostats that are in a poor design location. Replace thermostat or timer batteries as needed.
- Install timers in vending machine outlets.
- Consider adjusting thermostats +2° in summer and -2° in winter during working hours.
- Change furnace filters regularly.
- Replace older inefficient air conditioners with new energy-saving models as opportunities arise.
- Maximize use of natural day lighting with efficient furniture placement, light-colored walls and surfaces, and unblocked windows. Turn off overhead lighting as natural daylight increases.

Fleet and Fuel Efficiency

Fleet and Fuel Efficiency Goals

Reduction of greenhouse gas emissions and petroleum consumption associated with transportation will mitigate climate change, reduce smog, and reduce our dependence on non-renewable resources.

Applicable requirements:

- Reduce petroleum gasoline consumption by 20% by 2015 and increase non-petroleum fuel use by 10% annually (Energy Act, EO 13423).
- Federal agencies are prohibited from acquiring passenger vehicles that are not “low greenhouse gas emitting” vehicles, according to EPA guidelines (Energy Act).

Fleet and Fuel Efficiency Guidance

- Replace or convert some fleet vehicles from gasoline to hybrid vehicles.
- Avoid running vehicles on idle for extended periods. Turn off engine to save fuel and reduce emissions.
- Use conference calls when practical instead of driving to meetings at SO and Districts.
- Put instructions for setting up conference calls on Forest Intranet website.
- Encourage employees to take the most fuel-efficient vehicle available to get the job done.
- Combine errands or tasks whenever possible to minimize necessary trips.
- When vehicles are parked overnight outside, use windshield blankets during late fall, winter and early spring to reduce idling time needed to thaw frost buildup on windshields.
- Get rid of under-utilized vehicles in the Forest fleet when practical.
- Downsize ½-ton vehicles to ¼-ton vehicles as much as practical.
- Develop a green travel guide, using green practices for the logistics of meetings (meals, materials, hotel choices, etc), carpooling when traveling by rental car, renting fuel efficient vehicles, etc.
- Encourage and recognize employees that walk or bike or carpool to work.
- Convert landscape plantings at facilities to plants that need less mowing and fertilizer. Reduces fuel and the need for mowing.
- Check mowing schedule and increase time between mowing if practical.
- Use vehicle fuel efficiency measures such as filling up gas tanks in morning, keeping tires at proper inflation levels, changing air filter, keeping engines tuned and oil changed, etc. Make measures available to all employees through e-mail distribution, website posting, safety meetings, and other means. See Appendix B.
- Look for opportunities to design and offer projects and actions that can involve local contractors, vendors, cooperators, and volunteers. These opportunities should not only help stimulate local economies, but can also be done with less transportation energy consumption.

Water Conservation

Water Conservation Goals

Conserving water leads to fewer environmental impacts, less energy use, and less cost incurred from pumping, treatment, transmission, and distribution of water.

Applicable requirements:

- Federal agencies are required to designate managers to conduct analyses of energy and water used by 25% of the agency's buildings annually and to recommend ways to conserve energy. Two years after the analysis is completed, the agency must implement the energy and water saving measures identified in the building evaluation (Energy Act).
- Reduce water consumption intensity by 2% annually (16% by 2015), compared to 2007 baseline (EO 13423).

Water Conservation Guidance

- Install low-flow water devices and fixtures in facility bathrooms and kitchens to conserve water and electricity.
- Replace old office and barracks fixtures (kitchen and bathroom faucets, toilets, showerheads) with more efficient ones such as EPA-approved Water Sense products.
- Insulate hot water pipes and water heaters to avoid running extra water.
- Post reminders and contact numbers to report dripping faucets and malfunctioning toilets, especially in recreation sites.
- Deploy next-generation technology when opportunities are available (example: replace regular urinals with waterless urinals).

Recycling and Waste Reduction

Recycling and Waste Reduction Goals

Minimizing the amount of material we use and throw away reduces the risk of pollution to air, water, and land resulting from the production and disposal of these goods. There is also an indirect energy savings when we reduce, recycle, or reuse goods.

Applicable requirements

- Reduce the quantity of toxic and hazardous chemicals used (EO 13423).
- Maintain cost-effective waste prevention and recycling programs (EO 13423).

Recycling and Waste Reduction Guidance

- Review janitorial service contract to ensure services complement FS conservation measures.
- Work with suppliers to make cleaning products used in our facilities environmentally friendly.
- Incorporate contract specifications requiring on-site recycling and conservation measures for FS facilities managed and operated by concessionaires.
- Incorporate market development of bio-mass utilization of products into fuel reduction treatments.
- Eliminate FAX cover sheets. Use a rubber stamp made for fax transmittal or note size covers.
- Reuse single-sided paper for notepads or for draft copies.
- Avoid the temptation to print e-mails that are not necessary in hard copy. If you must save them, use your computer to file.
- Print double-sided copies whenever practical. Under Printers and Faxes, set specific printing preferences to "Flip on long edge" as the default setting.
- Turn off header pages for printers to conserve paper and electricity, and to reduce wear and tear on the printers.

- Avoid using color printers to print black-and-white hard copies.
- Claim your documents when you print them so that the paper is not wasted or thrown away.
- Stop FAX solicitations by phoning 1-800-number to get off their list; saves paper and electricity.
- Establish or improve recycling efforts at all locations (i.e. office paper, aluminum cans, redemption plastic, redemption glass, tin/steel cans, batteries, cardboard, newspapers/magazines/catalogs, toner cartridges, fluorescent tubes).
- Campgrounds and other developed recreation sites should have recycling bins as part of the waste management contract.
- Transition from disposable to reusable products, such as rechargeable ink cartridges and batteries, or ceramic mugs instead of plastic cups.

Green Purchasing

Green Purchasing Goals

Purchase environmentally preferable, “Green” products and services where practical.

Applicable requirements

- Purchase bio-based, environmentally preferable, energy-efficient, water-efficient, and recycled-content products (EO 13423).
- 95% of new electronics purchases must meet EPEAT or other applicable energy standards (EO 13423).

Green Purchasing Guidance

- Purchase and use printers with double-sided capability.
- Offer incentives to track and maximize green purchases.
- See Green Office Guide (Appendix C)

Green Purchase List (examples):

- ✓ Easy-to-recycle products.
- ✓ Remanufactured or recycled computer disks.
- ✓ Green copier/printing paper (At least 30% recycled content, chlorine free, lower weight).
- ✓ Remanufactured or recycled toner cartridges. Choose a vendor with a recycling program.
- ✓ Rechargeable batteries.
- ✓ Solar-powered calculators.
- ✓ Colored pencils, crayons, or colored wax (instead of solvent-based markers).
- ✓ Reusable inter-office routing envelopes.
- ✓ Dry-erase message boards or calendars, rather than flipcharts or paper calendars.

Green Purchasing Websites:

www.gsaadvantage.gov , www.treeco.com , www.jwod.com , www.greenearthofficesupply.com ,
www.futuresolutionsinc.com , www.buygreen.com , www.ecomall.com , www.energystar.gov ,
www.sustainableforestprods.org

Sustainability Leadership

Sustainability Leadership Goals

Achieving ecological sustainability requires the cumulative efforts of many individuals. Sustainability leaders must motivate, train, and recognize their fellow Forest Service employees. As a Forest, we are particularly well-placed to provide leadership and communication assistance to the regional area.

Applicable requirements:

- Establish within the agency programs for environmental management training, environmental compliance review and audit, and leadership awards to recognize outstanding environmental, energy, or transportation management performance (EO 13423).

Sustainability Leadership Guidance

- Construct an ecological foot print interpretive display for office and public events.
- Post the office ecological footprint on the Internet and Intranet.
- Work with Forest Public Information Officer to craft sustainable operations speaking points for media. In your respective work capacity, engage the public in a discussion toward reducing our collective ecological footprint.
- Explore opportunities for work-at-home agreements.
- Subscribe to sustainability and energy conservation magazines (on-line when possible instead of hard copy). Make available to all employees through routing, break room distribution, etc.
- Encourage walking or bicycle commuting under the wellness plan.
- Create incentives or competition among units (S.O. & Districts) to encourage conservation and sustainable operations.
- Host brown bag lunches and other presentations with conservation or sustainability themes.
- Share and compile lessons learned through regular (quarterly) conference calls with other Forest Green Teams/sustainability champions.
- Focus the message we want to convey regarding sustainability, and communicate this in local communities within the region.

Monongahela Internal Footprint Grant Program

Monongahela Internal Footprint Grant Program Goals

Use the money saved through increased efficiency to fund an internal grant program to further improve environmental efficiencies. Compare annual usage with baseline information and use the hard money savings and recycling returns to generate a pool of money for green grants.

Some ideas are listed below for potential use of the funds. More ideas are welcome.

Monongahela Internal Footprint Grant Program Options and Ideas

- Replace older, less energy-efficient equipment with ENERGY STAR equipment as budget allows. Here are some sample annual savings in energy costs from RO energy audit.
 - Replace 16 computers with Energy Star: save \$17, 0.2 tons CO₂

- Replace 200 monitors with Energy Star: save \$120, 6 tons CO2
- Replace 12 refrigerators with Energy Star: save \$288, 3 tons CO2
- Replace 2 televisions with Energy Star: save \$5, 0.04 tons CO2
- Replace 2 VCRs with Energy Star: save \$2, 0.02 tons CO2
- Replace existing pre-1990 refrigerators with efficient ENERGY STAR models.
- Install energy-efficient double pane windows (vinyl); windows with southern exposure should use reflective E-rating windows.
- Replace current fluorescent lights and ballasts with GE Ultrastart T8 lights and ballasts; conserves electricity and utility costs.
- Set up our facilities to be powered from solar energy (grid tie systems). Start small with one facility as a pilot project for the Forest.
- Pay for electric hybrid vehicle conversions.

The Challenge

As noted on the title page of this document, the Forest Supervisor is issuing a challenge to the Forest to lower our energy usage over the next 3 years by 5 percent a year. The following table shows recent electrical usage levels for Forest facilities by District, along with projected reductions in usage that would be needed to meet the Supervisor's challenge. The kilowatt hours (KWH) displayed are for all facilities with electric meters on a unit/district. For example, the Potomac RD includes not only the Petersburg offices but also the Seneca Rocks Discovery Center and Seneca Shadows Campground.

Unit	2007 KWH Used (Calendar Year)	2008 Projected Use for 5% Reduction	2009 Projected Use for 5% Reduction	2010 Projected Use for 5% Reduction
Supervisors Office*	10630	100985	9594	9114
Cheat Ranger District	138787	131848	125255	118992
Gauley Ranger District	112856	107213	101852	96760
Greenbrier Ranger District	70228	66717	63381	60212
Marlinton Ranger District	133284	126620	120289	114274
Potomac Ranger District	241819	229728	218242	207330
White Sulphur Springs	123451	117278	111415	105844

*These are for Yokum Street facility only. We are still tracking down SO #s through GSA.

Contacts

The following team members contributed to this action plan and may be contacted with comments, input, and suggestions to improve the plan.

Team Member and Contact	Duty Station	Contact Information
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APPENDIX A – RECYCLING

The following information is on recycling facilities in our area, which all employees are encouraged to use. Information is presented by county in alphabetical order. The information is current as of June 2008, but it is subject to change. Phone numbers are provided so that users may call ahead to determine if changes have occurred.

Barbour County

The closest site is the Barbour County Recycling Center, located on Midway Road off Route 250 between **Belington** and **Phillipi**. They are open from 9 a.m. to 2 p.m., Tuesday-Saturday. They accept:

- Newspaper
- Magazines
- Junk mail
- Office paper
- Bi-metal and tin cans (prefer no labels and flattened)
- Aluminum cans
- Corrugated cardboard (flattened)
- Used motor oil (3 gallon limit)
- Used vehicle/tractor and household batteries
- #1 and #2 clear plastics
- #2 or opaque plastics
- Pasteboard (with lining removed, like cereal boxes), but NOT wax-coated (like milk cartons)

Their phone number is 304-457-5074.

Grant County

The Dorcas 4-H Club sponsors a recycling drive twice a year (spring and fall) at the Tri-county Fairgrounds in **Petersburg**. Notice is published in the Grant County Press and the 4-H contact is Phillip Ankers at 304-257-2459. They will take:

- Newspaper (glossy inserts are okay, but no plastic)
- Magazines and catalogs (staples are okay)
- Office paper (including colored paper, stickies, and shredded paper)
- Clear glass bottles or jars (unbroken, without lids)
- Brown glass bottles or jars (unbroken, without lids)
- Aluminum cans
- Corrugated cardboard
- Pressboard (cereal boxes, etc.)
- #1 and #2 plastic bottles (without caps or lids)

Greenbrier County

The Greenbrier Recycling Center at 812 Monroe Avenue in **Ronceverte** had an Electronics Recycling Drop-off in January (14-19). Collections occurred from 8:30 a.m. to 5:00 p.m. on weekdays, and from 9 a.m. to 3 p.m. on Saturday.

All West Virginia residents, non-profits, and small businesses are welcome to drop off up to ten pieces of equipment per vehicle (keyboards, mice, and mobile phones do not count toward the ten-unit limit).

Products Accepted: Answering machines, camcorders, compact disc players, copiers, duplicators, electric typewriters, fax machines, hard drives, laptops, mobile phones, modems, pagers, personal computers (CPU, monitors, keyboards, mouse, and peripherals), printers, printed circuit boards, radios, remote controls, stereos, tape players, telephones and telephone equipment, televisions, VCRs, word processors.

Products Not Accepted: Microwaves, smoke detectors, and large household appliances such as refrigerators, washing machines, and air conditioners

For additional information, call Bob J. Bennett at the Greenbrier Recycling Center at 304-645-4232 or e-mail: greenbrierrecycle@verizon.net.

Hardy County

The Walmart in **Moorefield** has a cardboard box in the front foyer that takes recycled plastic bags.

Envirco, Inc. out of **Baker** WV collects the following materials at the following locations and times:

- Aluminum cans
- Paper
- Cardboard
- Clear and brown glass bottles

Wardensville Carnival Grounds – first Saturday of the month, from 9-12 a.m.

Moorefield Industrial Park – third Saturday of the month, from 9-12 a.m.

Mathias Community Center – fourth Saturday of the month, from 9-12 a.m.

Their phone number is 304-897-6080 or 1-800-235-4044.

Monongalia County

The Robert C. Byrd Health Sciences Center at WVU in **Morgantown** has collection boxes at the Copy Center, Warehouse, Facilities Surplus, and HSC Safety Office. They will take:

- Cell phones
- Rechargeable batteries (nickel metal hydride (Ni-MH); nickel cadmium (Ni-Cd); lithium ion (Li-ion); and small sealed lead (Pb) batteries found in cell and cordless phones, cordless power tools, laptop computers, PDAs, 2-way radios, etc.).

They do NOT take alkaline, non-rechargeable, or wet batteries. Their phone number is 304-293-6924.

Nicholas County

A bigger and better recycling center is now open in **Summersville**, located in the Walmart parking lot near the sign. (The one at DQ is gone.) There are four large containers for:

- Cardboard (remove staples and flatten as much as possible)
- Newspaper, office paper, shredded paper (remove rubber bands/plastic wrap, stack neatly)
- Aluminum cans (rinse, they may be boxed or bagged)
- Tin cans (rinse, they may be boxed or bagged)
- #1 and #2 plastics only (remove caps and lids, rings are okay)

NO glass or garbage please. Cheryl Tanner will transport recycling materials from the Gauley Office. The only change needed from the current recycling routine is to take the caps off of plastic bottles.

Pocahontas County

The Pocahontas County Solid Waste Authority has green boxes available in **Green Bank, Huntersville, Marlinton,** and **Hillsboro**, which are open Wednesday and Saturday from 1-5 p.m., and Sunday from 1-6 p.m. They accept:

- Newspaper
- Magazines
- Cardboard
- Pressboard
- Office paper
- Steel cans
- #1 and #2 plastics

They do NOT take glass. Their phone number is 304-799-4199 or 304-799-6262.

The Recycle Center in **Marlinton** takes all of the above materials plus aluminum and copper (for cash), and car batteries. Their phone number is 304-799-4083.

The **Marlinton** Landfill (where the Marlinton green boxes are) also accepts white goods (appliances) for free and tires for \$100 per ton.

Cardboard and magazines may be recycled at the transfer station in **Bartow**, every day except Thanksgiving and Christmas.

Randolph County

Two sites are currently available. The main facility is in **Dailey** on Route 250/219 (open 8-4, M-F), and there is also a mobile unit that can usually be found behind **Elkins** City Hall. If missing, the mobile unit is likely being emptied. Try again later. Both sites accept the following materials:

- Newspaper (including inserts)
- Magazines
- Corrugated cardboard (flattened)
- Office paper (shredded or non-shredded)
- Clear glass (no cookware, no lids)
- Brown glass (no cookware, no lids)
- Steel cans
- Aluminum cans (they pay \$0.45/lb)

They do NOT accept any plastics, green glass, pasteboard, pressboard, batteries, or oil. Phone number for Randolph County Solid Waste Authority (in Dailey): 304-338-2215

Tucker County

The city of **Thomas** has recycling bins (dumpsters with labels). Coming from Petersburg on Route 32, they are on the left, shortly before the highway turns into the one-way roads through town. They accept:

- Newspaper (no wet, soiled, wax, or glossy paper)
- Phone books
- Magazines and catalogs (including glossy inserts or flyers)
- Cardboard (No wet, soiled, or waxy. Flatten boxes and remove all liners or packing materials)
- Pressboard (No wet, soiled, or waxy. Flatten boxes and remove all liners or packing materials)

- Office paper (Envelopes, flyers, brochures, typing paper, computer paper, writing paper, junk mail, and index cards. No wet, soiled, or waxy paper, used paper towels and plates, colored paper, glossy paper, tissue paper, or spiral binders)
- Aluminum cans (empty, rinsed, labels removed)
- Steel cans (empty, rinsed, labels removed)

They do NOT take cans used for chemicals or paints, or aerosol spray cans. The phone number to call for more information is 1-800-645-4886.

Upshur County

The closest site to Elkins is in **Buckhannon**, next to the Walmart along Route 33. This site accepts:

- Newspaper
- Corrugated cardboard (flattened)
- Plastic milk jugs
- Clear plastic bottles (water, soda)
- Bi-metal and tin cans

Phone number for the Upshur County Solid Waste Authority: 304-427-8949

A good resource to use for recycling batteries, oil, electronics, light bulbs/tubes, and other items is:
<http://fsweb.r9.fs.fed.us/departments/nr/awlsm/environmental/compliance/recycling/resources.php>.

This site contains general information about recycling in the government, as well as links to many sites that provide state and national recycling resources, location, and contact information.

APPENDIX B – GAS MILEAGE TIPS

Fuel Saving Tips

There are numerous no- or low-cost steps you can take to improve gas mileage, combat rising gas prices, and reduce emissions. The most important place to start is at the gas pump; buy only the octane level gas you need. All gas pumps must post the octane rating of the gas under the FTC's Fuel Rating Rule. Remember, the higher the octane, the higher the price. Check your owner's manual to determine the right octane level for your car.

All new vehicles have an estimated Miles Per Gallon (MPG) range, where relatively flat highway driving is represented at the high end, and stop-and-go city driving is at the low end. These MPG numbers are typically the optimal results you can expect from your vehicle. However, these numbers can be reduced through poor driving habits and lack of maintenance. Here are some additional tips from the EPA to help you improve gas mileage.

Drive More Efficiently

- **Stay within posted speed limits.** The faster you drive the more fuel you use. For example, driving at 65 miles per hour (mph), rather than 55 mph, increases fuel consumption by 20 percent. Driving at 75 mph, rather than 65 mph, increases fuel consumption by another 25 percent.
- **Use overdrive gears.** Overdrive gears improve the fuel economy of your car during highway driving. Your car's engine speed decreases when you use overdrive. This reduces both fuel consumption and engine wear.
- **Use cruise control.** Using cruise control on highway trips can help you maintain a constant speed and, in most cases, reduce your fuel consumption. Safety reminder: do not use cruise control when it starts to rain or when roads are otherwise slippery.
- **Anticipate driving situations.** If you anticipate traffic conditions and don't tailgate, you can avoid unnecessary braking and acceleration, and improve your fuel economy by 5 to 10 percent. In city driving, nearly 50 percent of the energy needed to power your car goes to acceleration. Go easy on the gas pedal and brakes. “Jack-rabbit” starts and sudden stops are wasteful.
- **Avoid unnecessary idling.** Idling burns about a half-mile worth of gas every minute. Turn off the engine if you anticipate a lengthy wait. No matter how efficient your car is, unnecessary idling wastes fuel, costs money, and pollutes the air. Also, don't idle your engine to let it warm up before driving. Instead, start driving right away, but drive gently until the engine is warm.
- **Combine errands.** Several short trips taken from a cold start can use **twice as much** fuel as one trip covering the same distance when the engine is warm. If practical, go to your farthest destination first so your engine has a chance to reach its optimal operating temperature. Then make your other stops on the way back. With the engine warmed up, your car will restart easily and run efficiently all the way home.
- **Remove excess weight from the trunk.** Avoid carrying unneeded items, especially heavy ones. An extra 100 pounds in the trunk reduces a typical car's fuel economy by one to two percent.

Maintain Your Car

- **Keep your engine tuned.** Studies have shown that a poorly tuned engine can increase fuel consumption by as much as 10 to 20 percent depending on a car's condition. Follow the recommended maintenance schedule in your owner's manual; you'll save fuel and your car will run better and last longer.
- **Keep your tires properly inflated and aligned.** Car manufacturers must place a label in the car stating the correct tire pressure. The label usually is on the edge of the door or door jamb, in the glove box, or on the inside of the gas cap cover. If the label lists a *psi* (pounds per square inch) range, use the higher number to maximize your fuel efficiency. Under-inflated tires can cause fuel consumption to increase by as much as 10-20 percent. Keeping tires properly inflated is a very inexpensive way to improve gas mileage.
- **Change your oil.** Clean oil reduces wear caused by friction between moving parts and removes harmful substances from the engine. Change your oil as recommended by the vehicle manufacturer, both timing and type.
- **Check and replace air filters regularly.** Your car's air filter keeps impurities in the air from damaging internal engine components. Not only will replacing a dirty air filter improve gas mileage, it also will protect your engine. Clogged filters can cause up to a 10 percent increase in fuel consumption.

Commuting

- **Flexible hours.** If you can stagger your work hours to avoid peak rush hours, you will spend less time sitting in traffic and consume less fuel.
- **Choose efficiency.** If you own more than one vehicle, drive the one that gets the best gas mileage whenever possible.
- **Telecommuting.** Consider telecommuting or work-at-home agreements, if your employer permits them.
- **Carpool.** If possible, take advantage of carpools or ride-share programs.

Consider Buying a Fuel-efficient Vehicle

Deciding which vehicle to buy may be the most important fuel economy decision you make. The difference between a car that gets 20 MPG (miles per gallon) and one that gets 30 MPG amounts to \$5,000 over 5 years, assuming gas costs \$4.00 per gallon and you drive 15,000 miles a year. That works out to \$1,000 a year savings with a 30 MPG vehicle.

Visit www.fueleconomy.gov for more information. You'll find gas mileage estimates and other data from EPA for 1985-2007 model year cars.

APPENDIX C – GREEN OFFICE PRACTICES AND PURCHASING

Green Office Practices Guide (from the National Park Service, Pacific West Region).

Activity	Green Practice	References
Reducing Paper Use in Correspondence Procedures		
Sending Messages or Mail	Eliminate cover sheets for faxes - Use a rubber stamp especially made for fax transmittal or note size covers.	
	Use voice mail for short messages.	
	Send memos via email without a hard copy to follow.	
	Eliminate pictures and excess graphics on fax forms as they are wasteful in ink use and paper space.	
	Eliminate pictures and graphics from email so that if they are printed, less ink is used.	
Reuse	Reuse single-sided paper for notepads or for draft copies.	
	Reuse envelopes if possible or use rerouting envelopes for internal information.	
Receiving Messages or Mail	Avoid the temptation to print emails that are not necessary in hard copy. If you must save them, use your computer to file.	
	Remove yourself or your office from mailing lists and cancel subscriptions to periodicals, journals, etc. that are no longer useful to staff.	
	Subscribe to online versions of newsletters and other publications, when available.	
Documents/Forms	Make reports and data available online.	
	If feasible, make brief comments or responses to minor points in a document by writing directly on it instead of using a sticky note or writing a memo.	
	Revise documents to reduce length. Use smaller fonts, smaller margins, and single spacing. Consider reducing your image to fit two pages on one page on your printer or copier.	
	Proofread documents on the computer before printing.	
	Avoid making extra copies. Make extras later if needed.	
	Minimize the use of colored papers. They can be a recycling contaminant and contain dyes (particularly bright colors like yellow). Alternative attention grabbers include using colored markers across the top of the first page.	
	Consolidate and reduce the size of office forms. Forms should be available in electronic form.	Government Paperwork Elimination Act
	Avoid using blue envelopes except for confidential materials.	
	Circulate or post memos and publications through the office rather than making individual copies for everyone.	
	Print double-sided copies - always.	
Purchasing Copy Paper		
Recycled Content	Buy paper with at least 30% recycled content (mandatory).	www.federalsustainability.org
	Buy paper with at least 60% post-consumer content.	
Chlorine Free	Buy processed chlorine-free (PCF) paper.	www.chlorinefreeproducts.org
Weight	Buy lower basis-weight paper. (20lb txt rather than 24lb, etc.)	
Alternative Fibers	Consider purchasing paper made with alternative, non-wood fibers (such as kenaf).	www.conservatree.com
Purchasing Office Supplies		
Before Purchasing, Ask:	Do we already have this product in stock? Keep office supply storage areas organized and inventoried in order to reduce unnecessary purchasing.	

Activity	Green Practice	References
	Why is this needed and are there ways to eliminate it?	
	Can I reuse something else we already have instead of buying a new product?	
	What kind of packaging will this new product come with and is it recyclable?	
	Is it durable, non-toxic, or made with recycled content?	
Purchase:	Recycled-content office products listed on EPA's CPG list such as binders, folders, clipboards, presentation folders, desktop accessories, etc.	www.epa.gov/cpg
	Easy-to-recycle products.	
	Re-manufactured or recycled computer disks.	www.greendisk.com
	Green copier/printing paper (see Purchasing Paper above).	
	Remanufactured or recycled toner cartridges. Choose a vendor with a take-back program to recycle used cartridges.	www.unicor.gov
	Rechargeable batteries.	
	Solar-powered calculators.	www.gsaadvantage.gov
	Sturdy, durable staplers, scissors, file holders, bookends.	www.jwod.com
	Narrow-ruled notebooks and notepads.	www.treeco.com
	Colored pencils, crayons, or colored wax (instead of solvent-based markers).	www.greenearthofficesupplies.com
	Dry-erase calendars.	www.futuresolutionsinc.com
	Refurbished or remanufactured furniture.	www.buygreen.com
	Reusable interoffice routing envelopes.	www.ecomail.com
	Reusable mailbags and boxes.	
	Durable, reusable shipping pallets and crates made from post-consumer recycled materials.	
Recording & Tracking	Establish a tracking system for green purchasing, particularly for Smart Card purchases.	www.doep2.org
Purchasing Office Equipment		
Copy Machines, Printers, Faxes, etc.	Write specifications when purchasing equipment to meet energy standards, contain less toxic material, and consider end-of-life disposal.	www.newdream.org/procure/
	Buy properly sized Energy Star copiers.	www.energystar.gov
	Purchase printers with double-sided capabilities.	
	Minimize the number of machines in the office - use central copiers, faxes, and printers rather than several individual workstation machines.	
	Use fax modems or at least plain-paper fax machines.	
	Use computers and other equipment with modular features.	
Recycling and Reuse		
Packaging	Use shredded waste paper to replace purchased packaging materials.	
	Reuse package "cushioning" (peanuts, bubble wrap, etc.).	waste_pre/packaging.htm
	Most Mailboxes, Etc. will take peanut donations for reuse and some take styrofoam from electronics packaging.	www.mbe.com
	Reuse boxes, envelopes, and poster tubes. Recycle what can't be reused.	
	Request reduced or reusable packaging from suppliers.	
	Request cornstarch-based packing fill from suppliers.	
	Request that manufacturers take back all packaging.	
Reuse	Donate binders and other supplies to schools and other community groups.	
	Reuse envelopes with adhesive labels.	

Activity	Green Practice	References
	Share electronic pencil sharpeners and other items.	
Recycling	Recycle aluminum, glass, plastic, tin, white and mixed paper.	
	Recycle household and nicad batteries.	
	Recycle CDs, floppy disks, toner cartridges, and fluorescent lighting and ballasts.	
	Recycle computers and electronics where available. Donate to schools, charities, or similar organizations if in working condition. If not, recycle at local transfer stations, landfills with recycling collection, or recycling companies.	www.federalsustainability.org www.epa.gov/epr/products/computer.html
	Always put recycling and trash cans together for efficiency and consistency.	
	Centralize trash and recycling. Remove bins from unnecessary locations to maximize efficiency.	
	Check to see if bright colors and yellow, glossy paper, staples, and envelope "windows" are contaminants in your paper recycling program and eliminate their use if so.	
Printing Publications		
Pre-printing/ Specifications	Know your specifications (% recycled content, vegetable-based ink, weight, etc.) before sending a job to be printed. Learn about the printing process to ensure the most efficient and sustainable practice and product.	
Purchasing Publication Paper	Buy high recycled content, high post-consumer content, processed chlorine-free paper with the least weight needed.	
	Print on your publication the environmental attributes of your paper or printing process. (e.g. "Printed on 100% recycled paper using soy ink").	
	Avoid glossy paper and bright colors as they make recycling less effective.	
Types of Printing	Most low-volume ink jet printers use water-based ink while copiers and laser printers use toner, which contains petroleum products. However, copiers and laser printers can be more economical and resource efficient for an office. For small-scale in-house printing, a laser printer or copier may be more environmental. For large print-jobs, water or soy-based inks are preferred.	
Inks/Toners	Use soy, water, or vegetable-based inks where available - inquire before printing to ensure the printer has those capabilities.	www.soyink.com
Colors	Minimize the amount of colors used in a printing job.	
Double-sided	Always print double-sided.	
Electronic Options	Provide alternatives to printed publications online or on CD.	
Record Keeping/Central Files		
Filing/Storing Document	Have a Records Management Plan in place. Create a plan that will reduce the amount of file duplication. Files should be easily accessible and properly maintained.	
	File records efficiently. Keep only what is necessary and recycle or shred according to records management retention schedules. Correct file management saves resources, time, and money.	
	Make file management training available so staff members know how to manage their records efficiently.	
Create Less	The fewer documents there are around, the easier they are to find and manage. Create fewer copies, analyze forms and reporting requirements, and consolidate forms and reports	

Activity	Green Practice	References
	whenever possible.	
Meetings		
	Use technology like PowerPoint to reduce paper use for handouts.	
	Provide reusable name tags.	
	Seek naturally lighted meeting and exhibit spaces.	
	Use erasable boards instead of paper flip charts when possible. Flipchart paper is available in recycled content.	
	Inform visitors at the beginning of meetings about recycling procedures.	
Energy Conservation		
Machinery or Equipment Standards and Maintenance Plans	Review all maintenance plans. Practice routine cleaning and maintenance on machines to prevent failure and breakdown and ensure quality performance.	www.energyideas.org
Copier Machines, Printers, and FAX Machines	Maximize Power-Saver options. Use energy-saving features that minimize energy use when equipment is not in use but cannot be shut down. Activate the Power-save function on printers to power down after 15 minutes of inactivity.	
	Turn all photocopiers, printers, and computers off at the end of the day.	
	Install timers for after-hour and weekend shutdown.	
Computers	Use the energy features on computers and other equipment. Sleep modes greatly reduce wasted energy.	
	Use office energy devices such as master power outlets that shut down all equipment at desk.	
Lighting	Use occupancy sensors wherever applicable.	
	Use T-8 and T-5 fluorescent lighting fixtures or compact fluorescents where appropriate (rather than T-10 or T-12 that contain more mercury).	
	Convert exit signs, which run 24 hours a day, seven days a week, to compact fluorescent lamps or Light Emitting Diode (LED) technology.	
	Use minimal lighting. Install individual lighting for work stations to make efficient use of lights. Berkeley lamps use up to 75% less energy than incandescent or halogen lights.	Berkeley lamps: www.lightcorp.com
	Maximize natural day-lighting through windows with efficient furniture placement, white walls or surfaces, and unblocked windows. Turn off overhead lighting when natural daylight increases.	
	Only use the amount of overhead lighting needed for the task.	
Heating and Cooling	Install programmable thermostats to eliminate unnecessary HVAC use during hours when building is not in use.	www.eren.doe.gov/EE
	Use outside air economizers if available in the HVAC system.	
	Use fresh air for cooling and heating when appropriate. When the system is actively running, keep doors and windows closed to maximize efficiency.	
Other	Eliminate or minimize the use of individual radios, heaters, holiday lighting, fountains, and other non work-related amenities.	GSA regulation
Reducing Hazardous Waste and Purchasing Non-toxic Office Products		
	Use non-toxic, biodegradable janitorial products.	
	Buy non-toxic glues, pastes, glue sticks, and correction fluid.	

Activity	Green Practice	References
	Prevent pest infestations so pesticides won't be necessary. Follow good Integrated Pest Management practices such as maintaining clean eating and working spaces, removing food waste regularly, storing food in sealed containers, and inspecting plants for pests before bringing them to the office.	
Food Functions, Lunch Rooms, Break Rooms, and Lobbies		
Purchase:	Reusable, washable service-ware. If not possible, buy tree-free or biodegradable disposables over plastic or Styrofoam, or buy unbleached paper with high recycled content.	www.simplybiodegradable.com
	Coffee, etc. in bulk. Consider fair trade, shade-grown coffee.	www.fairtradefederation.com
	Reusable or unbleached coffee filters.	
	Washable tablecloths, napkins, placemats, towels if washing machine is available.	www.chlorinefreeproducts.org
	Unbleached paper napkins with recycled content in smaller, thinner thicknesses.	
	Unbleached paper towels with high recycled content.	
	Large-roll paper towels with smaller sheets & lighter weight.	
	Durable mugs; use and store extras for visitors.	
	Cleaning supplies with concentrated refills.	
	Concentrated, phosphate-free, non-toxic dishwash detergent.	
	Airtight, reusable food storage containers (instead of plastic wrap).	
	Spun-glass scouring pads (instead of steel wool).	
	An energy star refrigerator.	www.energystar.gov
Avoid Purchasing:	Styrofoam products, straws.	
Other:	Take home coffee grounds and use as a soil amendment.	
	Use insulated coffee pots, not hot plates.	
	Use microwaves, not ovens.	
	Turn off the light bulbs in the front of vending machines. They run 24 hours a day and do not affect the temperature or functions of the machine.	
	Install occupancy sensors and temperature sensors in vending machines to cool efficiently.	www.bayviewtech.com Vending Mi\$ers
Training to Reduce Paper and Energy Use		
Provide Mini sessions	Hold brown bag lunch sessions.	
	Provide training on how to use copier machines efficiently.	
	Provide training on how to use the computer for filing to reduce paper use.	
	Provide training on how to duplex print.	
Office Attitudes		
Special Events	Celebrate Earth Day (April 22) and America Recycles Day (Nov 15). Use them to initiate new ideas and generate interest in green practices.	www.earthday.net www.amercarecyclesday.org
Commuting	Encourage alternative transportation and carpooling. Offer incentives such as subsidized bus passes, providing secure bike parking, coordinating carpool schedules.	
	Encourage less use of Single Occupancy Vehicles.	
	Support flexible work locations.	
Employee Recognition	Support employees who practice sustainable behavior with awards, coupons, or other forms on recognition.	
Awards	Submit proposals for awards such as OFEE's Closing the Circle Awards, EPA's WasteWise Program, or DOI's Environmental Achievement Award.	www.ofee.gov www.doi.gov www.epa.gov/wastewise

Activity	Green Practice	References
	Give awards made from recycled content.	www.millerpromotions.com
Green Office Resources		
Energy Star Program	Provides guidance for purchasing energy efficient products and resources for improving workplace energy efficiency.	www.energystar.gov
EPA's Comprehensive Procurement Guidelines	Federal procurement requirements for office products such as paper and paper products, trash cans, desktop accessories, trash bags, envelopes, toner cartridges, binders, clipboards, file folders, and other supplies.	www.epa.gov/cpg
EPA's Green Office - Environmentally Preferable Purchasing Guides:	<p>Green Your Meetings and Conferences</p> <p>Greening Your Purchase of Copiers</p> <p>Greening Your Purchase of Electronics</p> <p>Greening Your Purchase of Cleaning Products</p>	<p>www.epa.gov/oppt/greenmeetings</p> <p>www.epa.gov/opptintr/epp/copiers.htm</p> <p>www.epa.gov/opptintr/epp/electronics.htm</p> <p>www.epa.gov/opptintr/epp/cleaner.htm</p>
	Business Guide for Reducing Solid Waste	
	Waste Wise Tip Sheets and Information	www.epa.gov/wastewise/pubs.htm
	Buy Recycled Series – Non-paper Office Products	www.epa.gov/cpg/pdf/nonpap00.pdf
	Buy Recycled Series – Paper Products	www.epa.gov/cpg/pdf/paper-00.pdf
Green Seal Program	Publishes “Choose Green” reports on products including: carpet, fluorescent lighting, copy paper, cleaners, lawn care equipment, occupancy sensors, paints, paper towels, particleboard and medium-density fiberboard, printing and writing papers, food packaging, and air conditioners.	www.greenseal.org/cgrs/report.htm
Office of the Federal Environmental Executive	Guidance for implementing Executive Order 13101	ww.ofee.gov
Other Publications	Source Reduction Procurement Guide – Source Reduction Forum of the National Recycling Coalition	www.nrc-recycle.org
	Re-Think Your Bottom Line – Alameda County guide to reduce, reuse, and recycle	www.stopwaste.org
	Workplace Waste Reduction Guide (President's Commission on Environmental Quality Solid Waste Task Force)	www.whitehouse.gov/ceq
	Business Guide for Paper Reduction – Step by Step Plan to Save Money by Saving Paper (Forest Ethics)	www.forestethics.org/pdf/reduce/pdf