

Land Air & Water



Kentucky Energy and Environment Cabinet

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Land Air & Water

since 1988

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From the Secretary's Desk

Recently as I was preparing remarks for a speech, I was struck by some of my own pessimism regarding many of the issues confronting the state: widely divergent regional unemployment numbers, uncertainty regarding the coal industry, particularly in eastern Kentucky, and the threat of increasing electricity prices and its impact on our citizens and businesses.

While it's important to retain a focus on potential and real threats, it's also important to occasionally remind ourselves of some of the positive things that have occurred in our energy and environmental programs. For example, the story on Page 5 of this issue highlights the overall trend in air quality emission reductions from regulated sources during the past 40 years. This trend has occurred while we have also seen a growth in the overall economy and in our population.

We've had similar successes in the areas of recycling rates, open dump cleanups, improved drinking water and enhanced energy efficiency. One of these successes is highlighted on Page 13, regarding the final cap on the Maxey Flats disposal site in Fleming County. We're very appreciative of the funding support approved by the Kentucky General Assembly that allows the cabinet to undertake the biggest cleanup project ever undertaken by the state.

Many people are not aware that, compared to surrounding and nearby states, Kentucky has a higher percentage of citizens served by public drinking water systems, second only to Illinois. Ninety-five percent of Kentuckians have access to public drinking water. Access to clean public drinking water plays a crucial role in the success of a society, from improved human health and from better opportunities for economic development. The public drinking water systems in Kentucky operate at increasingly higher rates of regulatory compliance.

As our population increases and the demands on our natural resources likewise increase, we will have to continue to strive to make progress in these and other areas. I appreciate the hard work and dedication of our cabinet employees, who have taken on more and more job responsibilities amid growing budget constraints.



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An Eastern screech owl
(*Otus asio*)
photographed in
Nelson County
by Todd Hendricks,
Division of Waste
Management.



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Former eyesore becomes benefit to community

Brownfield now home to model fire station

By Mary Jo Harrod
Division of Compliance Assistance

The old Russellville, Ky., fire station was so small and inadequate that the fire trucks could not be pulled entirely out of their bays to be washed without sitting in the street, creating traffic issues. City officials considered various properties for a new station before settling on the site of a former car dealership, which closed at the end of the 1980s. After the dealership closed, PCBs, left from a processing plant that was on-site in the 1950s, were found in the Town Branch (a stream running through the property), which led to a \$10 million settlement for remediation and a requirement to maintain a cap-in-place and monitor wells on the property forever. The building, which had been empty for years, had broken windows, a rotting wooden awning and was an eyesore. The site had become a brownfield—an establishment that is abandoned because of real or perceived environmental contamination.

The property and the fields behind the old dealership were donated to the city; however, funds were still needed to make the renovations. After the city received a Community Development Block Grant and wrote a comprehensive management plan that included restrictions on the land, the dealership was gutted and an addition was built to accommodate a modern, energy-efficient kitchen and training room. A 2,000-gallon rain barrel, placed behind the building, is used to water the sod. Energy-efficient heating and a three-hour

firewall were other improvements made to the structure, which was renovated to LEED (Leadership in Energy Development Design) standards, although money was not spent to have it certified. The fields have since been converted into a sports complex and wetlands for the community.

It was determined to be more cost-effective to reuse the building rather than buy land to build a new facility.

“It’s easier to get people on board for a project if they see that you are trying to keep the costs down,” says Kaye Simons, grant writer for the city.

This was evident during renovations when the firemen donated their time painting floors and saved \$12,000.

Restoration efforts also included four miles of stream cleanup and bank replacement. In the sports complex area, nearly 60,000 tons of clean fill dirt were hauled in to get the soccer field above the floodplain. In the building, new insulated doors with UV glass were purchased and installed within the eight large bays.

Bill Pearson, the city building inspector, says the community is proud of the transformation. The city’s mayor thought the project was a good fit.

“This project was ideal for a community our size because people pitched in to help,” says Mayor Mark Stratton.

The new station contains enough bays to accommodate all the fire trucks and

LEFT: The Russellville fire station is a functional, energy-efficient model for other communities.

BELOW: A 2,000-gallon rain barrel for watering the property grounds and new insulated UV glass doors occupy each bay.
Photos by Mary Jo Harrod



equipment. The property has an extensive paved area in front for washing the fire trucks and generally fits the needs of the department. Behind the station, the sports complex provides turf and natural grass playing fields for the entire community to use, which benefits an even greater number of citizens. The wetlands, installed to help clean up the area, educate local high school science students about natural habitats.

“The station has made a world of difference,” says Fire Chief Billy Poole. “The old station was half this size. The workout area had been in the bays where it was hot, and the training room was cramped. Now other fire departments and EMS units come here for training. The men are proud and love the new station.”

Now the city has a fire station that is a model for other towns, the former eyesore is gone and a functional, sustainable building is in its place. The property, once valued at \$758,000, is now assessed at \$1.5 million.

THESE DAYS, IT'S ROUGH BEING A BAT

By Dan Cox
Kentucky State Nature Preserves Commission

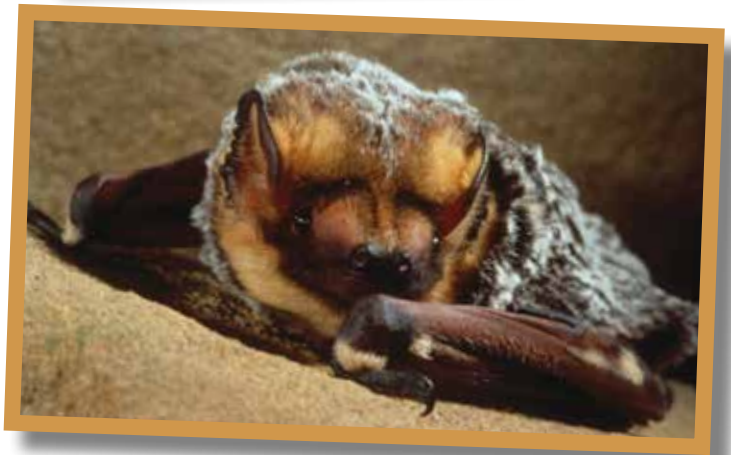
Few creatures are shrouded in as much myth and mystery as bats. Their nighttime aerobatics are viewed in amazement by some and in sheer terror by others. Contrary to many misconceptions, bats are not blind, don't get stuck in your hair and seldom transmit disease. Regardless of our individual view points, the fact of the matter remains—bats are the primary predators of night-flying insects and play key roles in ecosystems that often go overlooked. All but four of the 47 species of bats found in the U.S. and Canada feed solely on insects, including agricultural and forest pests.

In eastern North America, bats can be divided into two general groups: bats that hibernate in caves or mines during winter and roost in trees during summer (i.e. cave bats) and bats that mainly use trees for roosting year-round (i.e. tree bats). Although the two groups use different strategies to live, all bats struggle to survive. Raising young, avoiding predators, finding food, shelter and water only scratch the surface of obstacles they face. As if these challenges weren't enough, two new threats—wind energy facilities and white-nose syndrome—are having negative, if not devastating, effects on bat communities.

Wind energy facilities are essentially nonexistent in Kentucky, but their numbers have drastically increased throughout the Midwest, Northeast and Canada. For humans, this is great news as we step further away from our dependence on fossil fuels, but for bats it is a different and, unfortunately, sad story.

Wind turbines are killing tree bats at a staggering rate. By 2020, an estimated 33,000 to 111,000 bats will be killed annually in the Northeast alone. Hoary, eastern red, and silver-haired bats are suffering the greatest losses, with hoary bats composing about half of all documented fatalities. Most bats are killed at night when wind energy production is low but turbine blades are still moving. Studies have shown that preventing turbine blades from turning during relatively low wind speeds in late-summer and autumn, a time of year when many bats are migrating, can reduce fatalities by as much as 40 to 90 percent. Currently, it's unclear how many facilities use this technique to minimize deaths.

At the same time, cave bats are being killed by white-nose syndrome (WNS); a disease caused by the fungus *Geomyces destructans*. The disease, named for the white fungus that often appears on the muzzles of infected bats, is responsible for the deaths of more than 5.5 million bats throughout eastern North America. Seven species of cave bats, all of which occur in Kentucky, are known to be affected by WNS. The cause of death is not well understood, but infected bats become uncharacteristically active during winter months when they should be hibernating. When hibernating bats become active, they use up fat reserves and body water needed to survive the winter. In some hibernacula (caves or mines used for hibernation), 90 to 100 percent of bats



TOP to BOTTOM: Populations of the Rafinesque's big-eared bat, Hoary bat and Eastern red bat (with young) are seeing decreasing numbers due to the devastating effects of white-nose syndrome in North America, including parts of Kentucky, and wind energy facilities in the Midwest, Northeast and Canada.

Photos provided by John MacGregor

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Geothermal: first-year results

Saving our way into a green energy future

By Cindy Schafer
Office of Communications and Public Information

The heat wave that gripped Kentucky last summer brought numerous days in the 90's along with some triple-digit temperatures that had many comparing the heat and drought conditions to the Dust Bowl of the 1930s. While many families were cranking up the AC and dreading the arrival of their monthly utility bills, my home was being cooled by geothermal. In addition, my monthly utility bills showed fewer kilowatts used, meaning less of my paycheck going to the electric company.

How does geothermal work?

In May 2011, my husband Joe and I installed a geothermal or "ground-source" unit that uses the stable temperature of the earth to cool and heat our home (read "*Geothermal: Why We Did It*" in the summer 2011 issue). Operating much like a conventional refrigerant-based heat pump that captures and moves heat between the indoors and out through an outside fan coil unit, our geothermal unit works by circulating a water/antifreeze mixture through pipes, or "loops" buried deep in our yard where temperatures are a constant 50-55 degrees.

In winter, the loops extract the underground heat, as compared to a conventional unit that captures heat from cold air through the outside unit.

In summer, the process is reversed as heat is dispersed through the loops back into the



The Schafers at home in Franklin County, Ky.

“The tax credit helped us recoup our costs to within almost \$2,000 of a high-end, energy-efficient heat pump installation, and we hope to see total payback in about five years.”

ground and cooled, as opposed to a conventional unit releasing heat into the sweltering outside air. Geothermal units use one kilowatt-hour of electricity to produce 12,000 British thermal units (Btu) of heating and cooling, while a standard heat pump uses 2.2 kilowatt-hours. That is why geothermal is twice as efficient as a top-rated air conditioner or gas furnace.

“We created a spreadsheet that compared monthly averages before geothermal to monthly averages after geothermal. As a result, we saved about 35 percent per month or 660 kilowatts a year,” said Joe. “At the current Kentucky Utilities’ electric rate, that is nearly \$50 a month less in heating and cooling expenses.”

The results were based on data collected over a three-year period comparing actual

temperatures and actual days billed per month. This provided the most accurate account of savings due to last year’s warmer-than-average winter with temperatures averaging near 40 degrees in January and February followed by a sweltering summer that won’t soon be forgotten.

“Our savings are based solely on kilowatts used times today’s electric rate. This also eliminates other factors such as increases in taxes, environmental surcharges and other fees accessed on our monthly bill,” continued Joe. “The savings were a little less than we anticipated in the first year, but a tremendous savings nonetheless when you consider the whole equation.

“If Kentucky experiences more normal winter temperatures in January and February

this year, we should see our savings increase,” he said.

Costs and tax incentives

As compared to traditional heating units, geothermal requires more homeowner planning and more investment dollars based on soil conditions in the area, excavation and drilling costs, the length of pipe that has to be buried and basic installation. All these variables should be thoughtfully considered in addition to the number of years you plan to remain in your current home. However, taking advantage of the 30-percent federal tax credit can be a big incentive to switch to this form of green energy.

“The tax credit helped us recoup our costs to within almost \$2,000 of a high-end, energy-efficient heat pump installation, and we hope to see total payback in about five years,” said Joe. The tax credit can still be applied if units are installed before Dec. 31, 2016.

Rates, charges will rise but so will the savings

According to the Kentucky Public Service Commission, Kentucky Utilities’ base rates have changed three times since 2004 and another rate case is pending. Add to that various increases in monthly service and environmental surcharges and together they can raise a utility bill roughly 12 to 15 percent.

Nevertheless, the numbers don’t lie—and the proof is evident in our utility bill each month. The *Old Farmer’s Almanac* is predicting a colder-than-normal winter for 2013, so I predict that the Schafer household will continue to see lows in our utility bills and highs in our satisfaction with geothermal.

Water treatment on display at educational field day

By Allison Fleck
Division of Water



LEFT: A static display at the field day included a meter pit, a cylindrical pump and a fire hydrant.

ABOVE: The idea for the field day came from Travis McKinney (right), superintendent of Jeffersonville Water, with the assistance of Jeff Fultz, water treatment plant operator for the Cave Run Water Commission. Photos by Malinda Mays, Division of Water

Water utilities and agencies in Montgomery and Menifee counties held the first annual Water and Wastewater Consumer Educational Field Day Oct. 6 to help the public learn more about their local drinking water and wastewater utilities, services and personnel. The city of Jeffersonville sponsored the event.

“Most water-related public events focus on water conservation, which is certainly important,” said Jeffersonville Water Superintendent Travis McKinney. “But we wanted to go a different route and try to explain some of the costs of producing water that is safe to drink and safe to return to the environment. Water treatment may not be a glamorous business, but it can be very interesting and it’s one the public sometimes takes for granted.”

Eleven agencies gathered in and around Jeffersonville City Hall to lay out their wares for public inspection. There were fire hydrants and flush hydrant meters, pipes and valves, microscopes and meters—along with the price tags for their replacement.

“Most people don’t realize what it costs to maintain, repair and replace equipment related to water treatment,” said Jack Stickney, a geologist for the Kentucky Rural Water Association (KRWA).

Stickney, one of four featured speakers during the event, addressed an audience of 80 people on the rising costs of water production and distribution. He said the trend of rising costs is nationwide and reflects the aging infrastructure, more expensive electricity, chemicals and fuel, the higher cost of complying with regulatory mandates, as well as the rising costs of pensions and health care for water agency workers.

George Haynes, an operator certification trainer for the Kentucky Division of Compliance Assistance, said operators are required to have more knowledge in order to successfully treat drinking water and wastewater.

Field Day Sponsors

- Cave Run Water Commission
- Mount Sterling Water and Sewer System
- Montgomery County Sanitation District No. 2
- Levee Road Water Association
- Judy Water Association
- Montgomery County Water District No. 1
- Kentucky Division of Water
- Gateway Area Development District
- Reid Village Water Association
- Kentucky Rural Water Association
- Kentucky 811
- Menifee Sanitation District No. 1
- Natural Resources Conservation Services

“Protecting our water resources is one of the most important jobs in the world,” said Haynes. “Operators not only have to understand a plant’s mechanical systems, but they also have to learn about the latest advances in computerized control systems and treatment processes. Certification training and continuing education provide operators with the skills to ensure that the water purification and treatment processes are efficient and effective.”

Edsel Boyd, a district conservationist with the Natural Resources Conservation Service, said the state of the source water is also a factor in rising treatment costs. He provided information on how to protect source water through proper use of pesticides, protection of source water areas and other agricultural best management practices.

Danielle Rogers, an environmental inspector with the Kentucky Division of Water’s Morehead Regional Office, said everyone can help protect water resources by properly disposing of waste at home.

“Just because you flush human waste down the toilet doesn’t mean sewers are garbage disposal units,” said Rogers. “People cause hundreds of blockages in sewers by putting trash down the toilet, which can

Continued on Page 8

Kentucky's air quality success story

By Roberta Burnes
Division for Air Quality

Did you know that, in Kentucky, the concentration of acid-rain-causing sulfur dioxide in the ambient air has been reduced 81 percent since 1981? How about the fact that smog-forming nitrogen oxides are down 52 percent in the same time period?

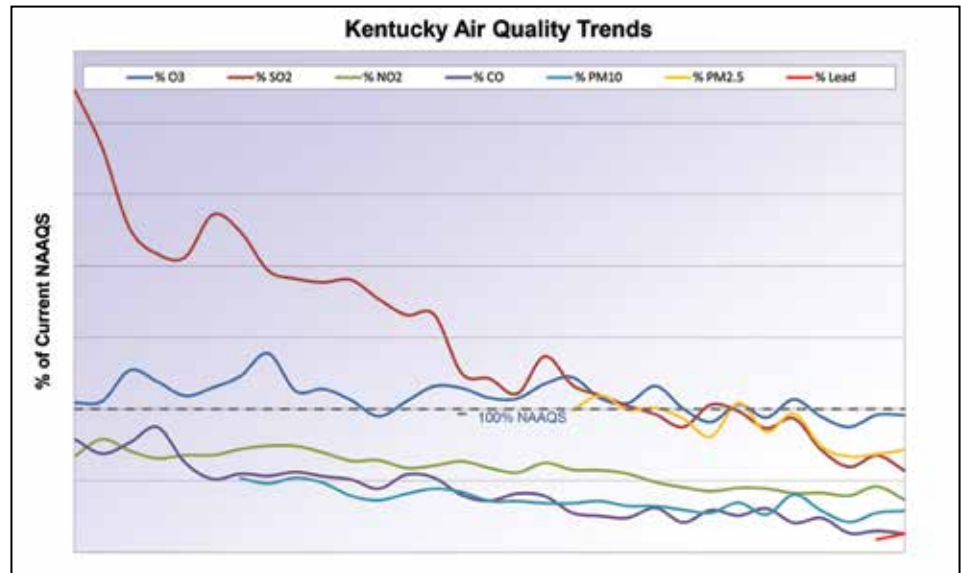
Kentucky's air quality has improved significantly in the more than 40 years since the Clean Air Act was enacted. The Clean Air Act established health-based limits on six of the most common air pollutants: lead, sulfur dioxide, nitrogen oxides, carbon monoxide, particulate matter and ground-level ozone. Since 1970, the Clean Air Act has reduced these key pollutants by more than 60 percent. Airborne lead has dropped 92 percent since 1980.

Making this downward trend in pollution levels all the more remarkable, Kentucky has seen continued economic development and population growth over the course of these past four decades. Our improved air quality is a significant achievement considering that economic and population growth results in additional pollution sources from expanded industry, more traffic and greater energy demand in a state that obtains roughly 93 percent of its electricity from coal. Yet as the economy has more than tripled, air quality has continued to improve – proof that environmental protection and economic development can go hand in hand.

“The Energy and Environment Cabinet (EEC) takes seriously its mission to balance environmental protection with smart energy strategies that bring economic benefits to the Commonwealth,” said EEC Secretary Leonard Peters. “These improvements in air quality highlight how local and state governments can work with business and other interests in a community to do what is best for both the economy and the environment.”

Better air quality in Kentucky is due to a combination of regulatory and voluntary programs put in place by local, state and federal governments. These pollution

This chart shows the trends in individual pollution levels over time. While individual pollutants may spike in certain years, the overall trend is a decline in pollution levels. Pollutants are shown in terms of percentage of the National Ambient Air Quality Standards (NAAQS) because different pollutants are measured in different scales, making direct comparison difficult.



reductions have had a profoundly positive impact on ambient air quality and public health for the citizens of the Commonwealth.

“Despite the fact that our air quality is better than ever, there is always more work to be done,” said Division for Air Quality Director John Lyons. “Kentucky will face new challenges in coming years to meet more stringent air quality standards and rules as required by the Clean Air Act.”

How Does the Clean Air Act Work?

The Clean Air Act establishes health-based National Ambient Air Quality Standards (NAAQS) for six categories of pollutants, known as “criteria pollutants”— sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), Ozone (O₃), Lead (Pb) and Particulate Matter (PM₁₀ and PM_{2.5}). Each of the NAAQS sets an upper limit for a criteria pollutant in the *ambient*, or outdoor, air. States use air monitoring to demonstrate whether the air meets those standards.

The Clean Air Act requires the NAAQS to be reviewed every five years and revised if necessary. During the

review, the Environmental Protection Agency (EPA) examines the latest peer-reviewed science to determine whether the standard needs to be strengthened to protect public health.

When a new standard is set, states have one year to recommend to EPA which areas are likely to meet the new standard (“attainment”) and which areas are not (“nonattainment”). The Division for Air Quality considers a range of factors when making attainment designation recommendations for Kentucky, including:

- Air quality and emissions data
- Level of control of emission sources
- Population density and degree of urbanization
- Traffic and commuting patterns
- Growth rate and patterns
- Meteorology
- Geography/topography
- Jurisdictional boundaries

EPA has one year to review state designation recommendations, modify the recommendations if necessary and make final attainment and nonattainment area designations.

Continued on Page 12

Raven Run is a 734-acre nature sanctuary in Fayette County located off Jacks Creek Pike. The sanctuary is open daily and visited by more than 32,000 people annually; however, most people do not know that a former county landfill is situated within the 10 miles of hiking trails.



Sanctuary has history of waste disposal

Abandoned county landfill at Raven Run is cleaned up

By Tammi Hudson
Division of Waste Management

Fayette County accepted household wastes, industrial wastes and construction/demolition debris at Jacks Creek Pike landfill during the late 1960s and early 70s. Following a fire in 1971, the landfill stopped accepting waste, was covered with a layer of soil and abandoned. In 2002, the Kentucky Legislature established a program to clean up orphaned or abandoned landfills, and Jacks Creek Pike landfill was placed on the priority list for cleanup because of its potential threat to human health and the environment. The landfill is situated in a ravine with natural springs flowing through it, and it produced a large volume of leachate.

The Division of Waste Management and its consultant, Tetra Tech Inc., worked with Lexington's Parks and Recreation Department to choose a nondisruptive technology to remediate the leachate.

Phytoremediation, which uses green plants to clean up soils and remove pollutants from the environment, was selected because it provides dual benefits by reducing the quantity and quality of leachate while maintaining the sanctuary's natural landscape. As trees mature, their roots uptake and remove contaminants from the leachate.

As funding became available, plans were developed to consolidate the waste into a smaller footprint, install a passive leachate collection system, replace the cap and plant trees on the landfill. With the help of Tetra Tech and the contractor, PECCO Inc., construction began on Dec. 12, 2011.

To minimize construction disturbance to Raven Run's visitors, cell phones and a mobile hot spot were used for communication and Internet service, eliminating the

need for temporary overhead utility lines. Equipment and materials also were staged away from main trails, and construction activity was not visible from the nature center.

In the first phase of the project, approximately 25,850 cubic yards of municipal waste and construction/demolition debris were consolidated and moved upstream 100 yards to fill the valley of the former municipal landfill and reduce the landfill footprint from 8.7 acres to 6.7 acres. Moving the waste upstream allowed the division to isolate a natural stream and redirect the flow to a diversion ditch resulting in a decrease of more than 10,000 gallons per day of leachate being generated.

A passive gravity system was installed, directing the leachate through a rock filled bioswale allowing natural overland flow.

The next phase of work was installing the phytoremediation cap. An estimated 27,800 cubic yards of backfill and topsoil were trucked from an off-site area to the nature sanctuary, and final contouring of the land was achieved within 28 days. Native species of water-loving trees, such as sycamores and poplars, were randomly planted. At completion, the disturbed 11 acres will be repopulated with more than 5,000 trees to provide a natural environment on the former municipal waste landfill. Native grass seed, including buffalo and Indian grass, was also broadcast in areas where the waste had been removed.

During the three years Jacks Creek Pike landfill operated, segments of the property were designated for changing oil and lubricating machinery. During the Division of Waste Management's site characterization, soil impacted with low levels of



TOP: *The old landfill area is now covered with native trees and grasses that will help remove pollutants from the soil in a process called phytoremediation.*

LEFT: *Raven Run's Red Trail is enjoyed by thousands each year.*
Photos by Virginia Lewis

Continued on Page 8

State revolving fund loan will upgrade sewer system, reduce overflows and save money

By William Averell
Division of Water

The city of South Shore in Greenup County has obtained a \$3 million-plus low-cost loan through the Clean Water State Revolving Fund to make improvements to its sewer system that will reduce wastewater overflows, improve collection lines and save money through energy-saving technologies.

“This project will improve the lives of approximately 709 customers (2,607 people) in South Shore,” said Cheryl Moore, mayor of the city of South Shore. “It will also save us more than \$9,000 in power costs alone by incorporating technologies that reduce energy use.”

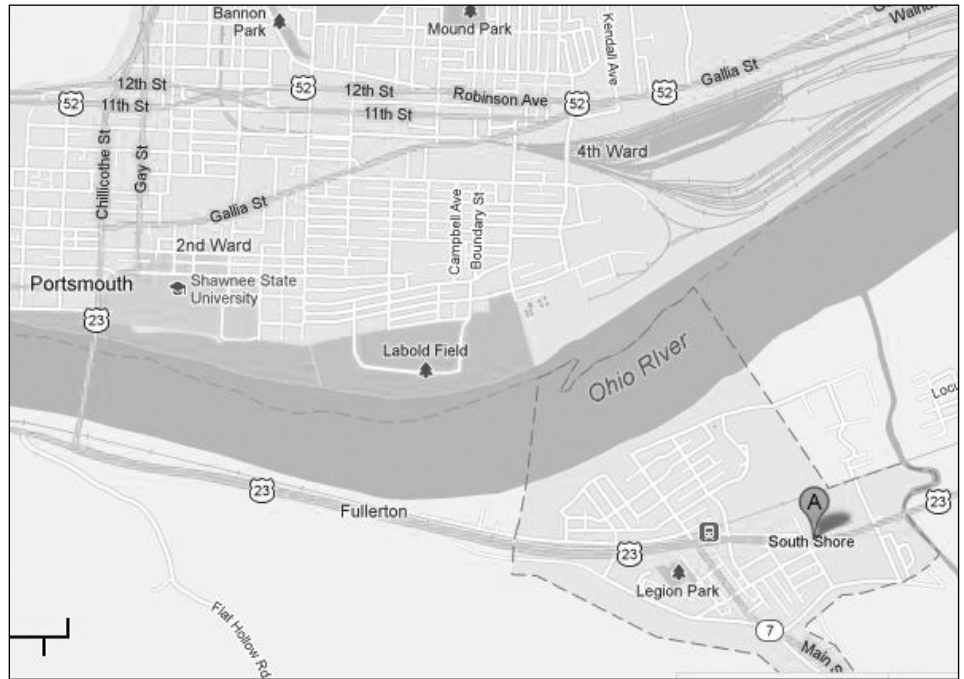
The loan, which is administered through the Kentucky Infrastructure Authority and Kentucky Division of Water, will allow the municipality to address several wastewater treatment issues in its sanitary sewer collection system and reduce infiltration and inflow into its 390 million-gallon-per-day wastewater treatment plant (WWTP).

In addition to the \$2 million WWTP capacity upgrade and the \$1.6 million sewer system upgrade, the city has applied for an additional \$1 million Community Development Block Grant (CDBG) to supplement the sewer rehab project.

South Shore’s WWTP and lift stations are frequently overloaded during moderate-to-heavy rain events, resulting in discharge of raw water sewage into residential and commercial areas and, subsequently, the Ohio River.

Despite improvements made to the city’s three major lift stations under a CDBG project completed in October 2011, the system was still operating beyond its maximum design capacity during heavy or prolonged periods of rain. Furthermore, a 1999 sewer system evaluation had identified areas in the collection system that needed slip-line replacement, cleaning and clearing.

Rehabilitation of the sewer system



will include conducting closed-circuit television evaluations, performing light cleaning and clearing of lines and recording the condition of all sizes of collector lines up to 40,000 linear feet of sewer. The project will also include repairs to or replacement of the slip-lining of 18,958 linear feet of dilapidated 8-inch lines located along several streets within the city limits.

The WWTP capacity treatment project features the addition of a 1.0 MG equalization basin to stabilize flow into the plant’s treatment system. The basin is a free-standing structure located at the beginning of the treatment chain that catches infiltration and inflow during heavy flow events and releases the flow into the WWTP as flows return to normal. The basin will be equipped with variable-speed influent pumps to stabilize (or equalize) the flow into the treatment plant for more efficient operation and treatment.

The remainder of the WWTP improvement project includes:

- Installation of a new supervisory control and data acquisition (SCADA) system and variable frequency drives on several pumps.

- Provision of phosphorus (biological) removal.
- Replacement of several telescoping valves.
- Installation of a new grinder, new flow meters, a new line grinder and new recycling- and waste-activated sludge pumps.
- Installation of dissolved oxygen meters.
- Construction of a maintenance building.

The city is investing \$30,000 of its state revolving fund monies toward the installation of the SCADA systems and \$175,000 of the loan amount for the variable frequency drive controllers as a means of demonstrating its commitment to wiser use of energy and resources. The SCADA will monitor the entire treatment plant while the controllers will provide greater energy efficiency in the pump station and elsewhere.

The city of South Shore is located in Greenup County along the Ohio River across from Portsmouth, Ohio.

KPDES facilities get ready for NetDMR

By Kenya Stump
Division of Compliance Assistance

In the age of the Internet, it's no surprise that the U.S. Environmental Protection Agency (EPA) has mapped out a nationwide plan to move to electronic reporting for NPDES facilities. The National Pollutant Discharge Elimination System (NPDES) program permits wastewater discharges as required under the Clean Water Act. In Kentucky, the Division of Water (DOW) is responsible for administering the Kentucky Pollutant Discharge Elimination System (KPDES) program. An essential part of any KPDES permit is the Discharge Monitoring Report or DMR. DMRs are a self-reporting tool that helps determine compliance with permit conditions and assess the quality of the wastewater discharge.

With the EPA's announcement that regulations would be developed requiring transition to an electronic reporting system for DMRs in early 2014, Kentucky was quick to take action. Now fully deployed for NetDMR, the national EPA tool for electronic reporting, Kentucky is actively notifying and educating facilities on the use of the new system. DOW anticipates having 100 percent of KPDES facilities transitioned by mid-2014. With more than 10,000 facilities currently permitted, this is no small task. A combination of online tools, classroom training and working through the trade associations are being used to assist systems with the transition to the new electronic system.

Why transition to an electronic system? NetDMR will allow for a reduction in paperwork, improve data quality, allow for more timely data processing and increase data accessibility. All in all, it allows for DOW and permitted facilities to become more efficient at DMR submittals and reviews. For many facilities, it may actually decrease the probability of being cited for minor data errors seen on traditional paper DMRs.

In the next year, current facilities can expect to see changes in permit language relating to NetDMR submission in their KPDES permits. These changes will be made on any new or renewed individual permits and for any newly issued general permits. For all other facilities, DOW will be sending out notification letters specifying the date for mandatory transition to NetDMR.

The Division of Compliance Assistance (DCA) has been working with DOW on outreach and education relating to NetDMR. DCA advises facilities not to wait until the last minute to make the transition. Facilities should go ahead and start talking to management and other entities, such as laboratories, about NetDMR and coordinating efforts. For those who want to practice with NetDMR, a test site is available that gives facilities a secure environment to learn and practice submitting DMR data electronically before officially submitting via NetDMR.

For more information on NetDMR, visit <http://water.ky.gov/permitting/Pages/netDMRInformation.aspx> or contact DCA at envhelp@ky.gov.

Sanctuary has history of waste disposal

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volatile organic compounds was identified beside Raven Run's popular Meadow Trail. Approximately 900 cubic yards of soil were removed, sampled and transported off-site for disposal. The excavated area was backfilled and hydroseeded with native grasses.

The division worked diligently to keep activities at the park uninterrupted, minimized disturbance to surrounding homes and maintained the natural beauty of this popular park. As a testament to the staff's attention to detail, they stopped construction on a diversion ditch to relocate a nest of five turtles to a new habitat.

The project was completed on June 26, 2012. For information on Raven Run Nature Sanctuary, visit <http://www.lexingtonky.gov/index.aspx?page=276>.

Water treatment on display at educational field day

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Jack Stickney, a geologist for the Kentucky Rural Water Association, manned a display.
Photo by Malinda Mays, Division of Water

cause overflows within the collection system. And just because an item is called 'disposable' does not mean it is safe to flush."

Rogers reminded the listeners to never dispose down drains—toilets or otherwise—baby diapers and wipes, prescription medicines and devices, feminine products, plastics, razors and blades, grease, paint and solvents, fertilizers, pesticides or poisons.

In addition to learning about water treatment and protection, visitors walked away with free gifts. Among the topic-appropriate door prizes donated by the sponsoring agencies were garden hoses and spigots, buckets and plungers, water bottles and coolers.

Malinda Mays, a capacity development specialist at the Division of Water, was one of several division representatives who participated in the event.

"Travis McKinney and Mayor Steven Barnes did a fantastic job organizing and hosting the field day," said Mays. "It is my hope that more utilities will plan similar events to help educate water customers about what they're paying for and that clean water is not free."

Floyds Fork Watershed

TMDL will address nutrient pollutants; condition of stream

**By Janet Pinkston and Arnita Gadson, Kentucky Environmental Quality Commission
Photographs by the Kentucky Division of Water**

What is the value of a pristine stream? Who owns a creek that meanders for 62 miles through six counties of Kentucky landscape? Whose job is it to protect the stream for all who wish to use it? How can they do so in a way that accommodates growth and protects the asset for future generations?

This is the drama playing out on Floyds Fork Watershed, a once-rural waterway now situated on the rapidly developing suburban fringe of Jefferson County. The headwaters of the creek begin in Henry County and continue through Oldham, Shelby, Jefferson, Spencer and Bullitt counties draining 284 miles and covering 180,000 acres.

In the case of Floyds Fork, the creek is not a source of drinking water, but it is used by anglers and canoeists. Federal regulators do not recommend eating the fish from Floyds Fork as the creek has been classified as an impaired body of water. The fact that Floyds Fork made the impaired list is a big deal because once this happens, the state is mandated to clean it up.

The creek has large and medium-sized sewer plants, as well as many small package treatment plants discharging to its waters. Eight of these facilities are owned by the Metropolitan Sewer District. Some are scheduled to be replaced under existing rules and regulations, and the cost of potential new controls could fall



For thousands of years, the creek flowed relatively unimpacted by man until the modern world intervened and brought with it the pollution that trails an industrial society. These contaminants include raw sewage, sediment, pesticides from lawn chemicals, farming, golf courses, plus highway salts, oils and grease.

According to the U.S. Environmental Protection Agency (EPA), Floyds Fork Creek has been under significant pressure from new construction. Pollution from these pressures has reached a point where the federal government has declared Floyds Fork too polluted for swimmers and unhealthy for fish.

It is a land use story playing out nationwide. When cities grow, the countryside is minimized.

The galloping press of humanity means that the infrastructure for sewer and stormwater treatment must keep pace with development in order to protect natural resources. EPA's role in that process is to protect public health using the Clean Water Act as its guideline.

Cane Run is a tributary of Floyds Fork Watershed, located in Jefferson County upstream of the Thurman Road Bridge. Studies show that it supports a healthy biological community.

on public entities such as city governments, private businesses and citizens.

According to Louisville lawyer Bud Hixson, increased protections on the horizon may help the creek survive progress.

"It's now admitted and understood that we've reached and exceeded the loading capacity of this stream with pollution,"

said Hixson, who testified before the Kentucky Environmental Quality Commission (EQC) in August.

"The whole point of the Clean Water Act is to save beneficial recreational and wildlife resources for future generations.

We are in an era where impacts, pressures, industrial development and human encroachment have reached crisis proportions on nature. Sewer plants are loading the stream in both wet and dry weather...this was not the intent of the Clean Water Act. It was to limit pollutants, and if not working, to limit them more," he continued.

Continued to next page

RIGHT: *Floyds Fork Watershed flows through six counties.* Map by Tetra Tech Inc.

CENTER: *Longear sunfish (*Lepomis megalotis*) collected from Long Run in Jefferson County.*

BELOW: *Mark Vogel of the Kentucky Water Quality Branch holds a snapping turtle at Cedar Creek in Jefferson County.*



How does the designation "impaired water body" affect you?

It means that these waters are considered too polluted for human recreational use and contact. It also means these waters are polluted beyond the healthy threshold for aquatic life. As a result, resources and strategies need to be implemented to clean up the water. These could include updates to sewage treatment systems, increased controls for stormwater management, construction of streamside vegetated buffers and education/outreach efforts for landowners.

Upgraded sewer plants may be key to cleanup, but there are other sources of pollution, such as run-off from farm fields, leaks from septic tanks and stormwater run-off from cities large and small. Improved infrastructure is instrumental to preventing unlawful discharges of pollutants.

First though, a study is under way and must be completed to identify pollution sources. The document's preliminary conclusions and modeling are a particular worry to farmers who fear that farming will be over-cited when sources of pollution are detailed.

Why? Because the document at the heart of the discussion, called Total Maximum Daily Load or TMDL, will require data collection and computer modeling to identify sources and causes of nutrient pollutants. The Floyds Fork TMDL will be the first modern nutrient TMDL in the state addressing nutrient pollutants, total phosphorous and nitrogen. When phosphorous and nitrogen are introduced to bodies of water, they can cause excessive algae growth, which leads to excessive amounts of nutrients that will affect the levels of oxygen in the water.

In other words, what happens at Floyds Fork may have wide-reaching implications and influences statewide. One implication may be higher sewer rates. A previous wave of federal involvement in Louisville to prevent sewer overflows resulted in a consent decree between the city and EPA. The Metropolitan Sewer District agreed to upgrade infrastructure and improvements underwritten with a ratepayer surcharge.

Since the stakes are high at Floyds Fork, the state has assigned the Kentucky Water Resources Research Institute (KWRRRI) at the University of Kentucky to lead a conversation about the creek with people who live, work and play along the watershed. The goal of the process is to identify shared values, minimize conflict and maximize consensus, according to Dr. Lindell Ormsbee, the hydrologist and scholar leading the effort.

Citizens and citizen groups are encouraged to participate in the conversation that will include questions such as whether sewer plants should be regionalized or made larger to replace small, aging plants. Will stronger water quality pollution controls lead to higher sewer treatment rates? And, how will growth and development be managed?

Visit KWRRRI's website at <http://www.uky.edu/WaterResources/FF/index.html> to learn more about the effort. KWRRRI is gathering data about water quality science and human factors for a report due June 2013. To get involved, call 859-257-1299 or email Christie.Oliver@uky.edu or Ormsbee@uky.edu

"The EPA is turning the page on local regulations, and we want people to be up to date on potential implications," said Arnita Gadson, executive director of the Kentucky EQC.





Richardsville Elementary School is the nation's first net-zero energy public school in Kentucky. Photo by Sherman Carter Barnhart Architects

High-performing schools in Kentucky

By Eileen Hardy
Department for Energy Development and Independence

Years of careful planning, lessons learned and innovative technology have launched Kentucky's energy-efficient schools into the national spotlight and were most recently the talk of the town in Washington, D.C.

Last month, Greg Guess, director of the Division of Energy Efficiency and Conservation in the Department for Energy Development and Independence (DEDI), addressed the High-Performance Building Congressional Caucus Coalition, a private sector coalition working with the Congressional Caucus to promote and showcase best practices in high-performance building design. These high-performance strategies have set new standards for Kentucky's school construction and operation. One school that exemplifies these new standards, for example, is the new Richardsville Elementary School in Warren County, the nation's first net-zero energy public school—one that produces at least as much energy on site as it uses.

DEDI has long recognized sustainability as a key component of a school district's building portfolio, and has sought to market these features in its efforts to transform the state's school buildings. When federal stimulus funds were awarded in 2009, DEDI carefully planned a strategy to increase energy efficiency and the use of renewable energy resources for all market sectors, including K-12 schools.

A true high-performance building is rooted in a whole-building approach that integrates multiple energy-saving strategies early in the design process. It requires all stakeholders to be a part of the project from design inception through project completion. High-performance schools also become a learning tool for students as designs increase the opportunity for students to explore their building's construction and learn more about the conservation of water, energy and other resources.

"Schools are built to educate our students. High-performance schools are built to better educate students and reduce operating costs over the life of the building," said Guess. "The

design phase of a school building is the most economical time a district will ever have to capture those savings. When schools were built 50 years ago, energy consumption and carbon footprint were not considered. Today, energy conservation, sustainability and building operations—all attributes of a high-performance building—are part of the discussion and overall decision-making process for school districts."

Kentucky's first significant 'green' public school was built in 1992. Paint Lick Elementary, in Garrard County, was a pilot project to demonstrate the effectiveness of the then relatively new geothermal ground-source technology. The building was a huge success and was given an "Engineering Excellence Award" by the national Society of Professional Engineers. Today, Kentucky has nearly 300 public schools (about 25 percent of Kentucky's major K-12 buildings) heated and cooled with geothermal systems—among the highest percentage of geothermal schools in the nation.

More recently Milton Elementary in Trimble County proved high-performance schools do not have to add to construction costs. Milton Elementary, opened in 2009 with one of the lowest cost (\$149.46) per square foot school buildings in Kentucky, is one of seven Kentucky schools to earn EPA's highest ENERGY STAR score of 100, putting it in the top percentile for efficiency among all schools nationally.

Warren County Public Schools is an example of a school district that makes energy management the foundation for all of its schools to ensure high-quality buildings and low-operational costs. In 2003, Warren County Public Schools hired its first energy manager and within the first year saved the district \$560,499 by making relatively low-/no-cost changes in building maintenance and operation. Since then, the district has offset more than \$7 million in energy costs. Those savings equate to about 45 teaching positions—something every school district facing a lean budget can appreciate.

As Warren County's school leadership continued to investigate innovative design strategies and high-performance features,

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Celebrity Status

Richardsville Elementary has been featured in recent issues of Parade Magazine, the High-Performing Building Magazine and "Yes" Magazine. Richardsville is also featured as a model for net-zero energy buildings in the 2011 national guideline, "Advanced Energy Design Guide for K-12 School Buildings, Achieving 50% Energy Savings Toward a Net-Zero Energy Building" developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, the American Institute of Architects, Illuminating Engineering Society of North America, the U.S. Green Building Council and the U.S. Department of Energy.

THESE DAYS, IT'S ROUGH BEING A BAT *Continued from Page 2*

have died, with little brown bats losing the greatest numbers. There is no known cure for WNS; however, some species of conservation concern have shown resistance to the disease, including federally endangered Virginia and Ozark big-eared bats.

WNS was first identified in New York in 2006 and has since spread to four Canadian provinces and 19 states, including Kentucky. Its spread into Kentucky is significant because thousands of bats hibernate in the state's vast network of caves. To date, the disease has been found in three counties—Trigg, Breckinridge and Wayne. Although the disease will likely continue to move across Kentucky, efforts have been made to slow its spread. Some caves have been closed, and others, such as Mammoth Cave National Park and Carter Caves State Resort Park, are using decontamination systems for guided tours. Protocols for decontaminating equipment are also being used by researchers and cavers. General information about WNS, disinfection protocols and information for cavers and cave owners can be found on the Kentucky Department of Fish and Wildlife Resources website at <http://fw.ky.gov/app2/navigation.aspx?cid=820&navpath=c741c761c1024>.

So let's take a step back and look at the big picture. Most tree and cave bats give birth to only a single offspring once a year. Given their low rate of reproduction, bat populations have difficulty recovering when their numbers decrease and are highly vulnerable to extinction. Considering this and the drastic population declines of recent years, many bat communities are in serious trouble. Researchers estimate that loss of bats throughout North America could lead to agricultural losses of more than \$3.7 billion per year due to increased numbers of insect pests on the landscape. This price tag may seem high, but bats are voracious predators. A single little brown bat (a species threatened by extinction due to WNS), can consume around 1,000 mosquito-sized insects in just one hour. For now, it's difficult to know how long it

will take bat populations to recover, or if they can recover at all.

Kentucky has 14 regularly occurring bat species; seven of which are listed as endangered, threatened or of special concern. Each species is important, and there are actions that we can take right now to help our winged friends, such as selecting native plants for landscaping. Native plants benefit the insects that bats

depend on for food. In woodlands we can maintain mature and dead-standing trees with peeling bark to serve as maternity roosts. The most important thing we can do is care about the benefits and threats to bat communities and take time to teach those around us. Hopefully, with a better understanding of bat ecology and increased awareness of their challenges, our bat populations will soon be on the mend.

Kentucky's air quality success story

Continued from Page 5

What happens when an area gets designated nonattainment?

"The Clean Air Act requires pollutant levels in nonattainment areas to be reduced," said Lyons, "and it takes a comprehensive strategy to make that happen." That's where the State Implementation Plan (SIP) comes in. The SIP is an air quality plan that shows how to attain or maintain the NAAQS. Each state is responsible for developing a SIP to demonstrate how the NAAQS will be achieved, maintained and enforced. Specifically for nonattainment areas, the plan includes:

- Enforceable emission limitations
- Control measures
- Emission inventories
- Ambient air monitoring
- Enforcement measures

A nonattainment area typically must achieve attainment status no later than five years after it was designated nonattainment.

"Tighter standards for several criteria pollutants have been adopted or proposed



in the past few years, most recently for sulfur dioxide and nitrogen dioxide," said Lyons. "As a result, some counties may find themselves in nonattainment for the first time in many years."

The Division for Air Quality will continue to work closely with counties to attain and maintain air quality standards, to ensure clean air for all Kentuckians now and for years to come.

These photos identify various pollution sources such as power plants, open burning and automobile exhaust.



Maxey Flats project nears completion

Final cap will ensure a healthier environment

By Cindy Schafer

Office of Communications and Public Outreach

On a hilltop in Fleming County, 55 acres covered by a heavy black liner or “cap” stand in stark contrast to the wooded areas about five miles from the community of Hillsboro. The site is Maxey Flats, and it serves as a reminder of how hazardous waste was disposed of decades ago. The site received waste from 1963 to 1977 and now encompasses a total of 830 acres, including the restricted area and surrounding buffer zone land. Today, the 55-acre disposal area is securely fenced off from the public and marked “restricted.” Buried beneath the geomembrane liner is approximately 4.7 million cubic feet of low-level radioactive and hazardous waste. The site was placed on the National Priorities List for cleanup in 1986, and after ten years with the current cap in place, the site is ready for the installation of a final long-term cap.

The current liner deters rainwater from entering the underground trenches that contain the waste. Rainwater is then diverted into ditches at the perimeter that drain into a single basin area.

Since 2002, Kentucky Department for Environmental Protection staff have inspected and made repairs to the current cap, as well as monitored and sampled the surrounding area to ensure the safety of the community.

“We monitor 82 sumps in the restricted area on a quarterly basis,” said Jeff Stamper, an environmental technologist who has worked at Maxey Flats for 33 years. “Each sump extends 15 to 40 feet into the underground trenches and allows us to check the water levels within the trench.”



LEFT: Jeff Stamper collects a water sample from the east drainage area. Maxey Flats photo
ABOVE: A polypropylene liner covers 55 acres of radioactive waste. Photo by Cindy Schafer

These sumps, originally installed to monitor and remove water, are now used to evaluate the effectiveness of the cap to stop infiltration of rain water. All of the existing sumps will be abandoned before the final cap is installed. Additionally, there are eight surface water sampling stations and 34 ground water wells located on the property that require routine monitoring. Samples are collected and taken back to the onsite laboratory at Maxey Flats for processing.

“Some of these sampling stations and monitoring wells contain automated samplers that are programmed to collect samples every six hours to pinpoint whether any radioactive material has been released into the environment,” Stamper continued. More than 3,000 surface and groundwater samples are analyzed at the lab each year.

“Our staff takes great pride in their responsibilities, realizing that residents who live around the site depend on them to do their jobs to protect public health and the environment,” said Scott Wilburn,

Keeping the Public Informed

An open house was held at Maxey Flats on Nov. 1 that allowed local residents and the media the opportunity to learn more about the Final Closure Period, tour the perimeter of the restricted area and ask questions.

According to Wilburn, 42 attended the event—a decrease in attendance from previous open houses, but he still considers the event to be a success.

“The attendees were able to learn firsthand about the accomplishments of the Maxey Flats Project, but many more will read of our successes in one of three newspapers that covered the event,” said Wilburn. “An informative radio interview was also broadcast multiple times during the week leading up to the open house.

“It’s always positive when we can educate the public about the real radiation concerns associated with Maxey Flats and dispel the exaggerated and erroneous stories that have been passed down through the years.”

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Kentucky Wild Rivers Program adds 300 acres to inventory of protected lands

By Allison Fleck
Division of Water

The Kentucky Division of Water has purchased 300 acres on two tracts of land in Hart County to help protect the exceptional quality and aesthetic character of the Green River, which is designated a Kentucky Wild River.

The 135-acre Rush Island Bend tract includes one mile of frontage on the Green River and adjoins property owned and preserved by the Hart County Historical Society. The 165-acre Davis Bend tract, which includes 2.5 miles of frontage on the river, contains a mix of moist bottomlands, relatively dry uplands, a sinkhole pond, two sinkholes and springs that are important to the water quality of the Green River. The Davis Bend tract will be co-managed with the Kentucky chapter of The Nature Conservancy.

The Green River harbors one of the most diverse assemblages of fish and freshwater mussels in the U.S. More than 150 fish species and 70 mussel species have been found in the river.

The purchases were made possible through an award from the Heritage Land Conservation Fund (HLCF), which is funded from the sale of nature license plates and the collection of unmined mineral taxes and environmental fines.

These funds may be used to purchase natural areas with rare habitats and endangered species; areas important to migratory birds; areas that perform important natural functions that



are subject to alteration or loss; and areas to be preserved in their natural state for public use, outdoor recreation and education.

The Kentucky Wild Rivers Act of 1972 designated segments of nine rivers as wild rivers. This designation allows the segments to retain many of their natural attributes and it protects them from unwise use and development. Each wild river is actually a linear corridor encompassing 2,000 feet of all land on either

side of the river. Some activities within these corridors are strictly prohibited, such as surface mining, clear-cutting of timber and construction of dams or other in-stream disturbances. While existing residential and agricultural use may continue, developments or activities that might impair the river's water quality or natural condition are regulated through a permit system.

When property owners are willing, the state may purchase lands within the corridor or within the watershed of the wild river to further protect the waterway. These lands are then subject to the restrictions imposed on the wild rivers corridor.

ABOVE: The Davis Farm tract includes 2.5 miles of river frontage and this waterfall. **BELOW:** Rush Island Bend tract includes one mile of Green River frontage. Photos by Zach Couch, HLCF



Composting made easy

Casey County Field Day provides demonstration to multi-county landowners

By Kimberly Bartley
Division of Conservation

In October 2012, about 75 landowners and county representatives gathered on Brent Woodrum's farm in Casey County to get a look at his composting operation. Woodrum is only the second landowner in Kentucky to provide a livestock composting operation that will serve multiple counties.

Originally, the idea of composting livestock was foreign to most Kentucky farmers. However, the University of Kentucky extension services, the Department of Agriculture, as well as Kentucky's conservation districts have helped livestock owners realize that composting is an easy way to dispose of their large farm animals, while protecting groundwater from pollution.

The University of Kentucky's Dr. Steve Higgins was on hand to demonstrate the composting process during the field day event. First, Higgins stressed the importance of locating the composting area on level ground with surrounding vegetation at least 150 feet away from any body of water on the property. Next, a 2-foot pile of mulch, wood chips or sawdust is added to create the heat needed to begin the composting process. An animal is then covered with another 3 feet of the material. If done properly, the inside of the pile will reach a temperature of 160 degrees as

the bacteria decompose the carcass. Six weeks later only bones will remain and the mulch material can be used again.

This can be done on every farm in the country; however, most landowners are scared of the process. It is a win-win situation with no odor, no scavengers or threat of water pollution.

It also offers the perfect solution to many operations that have close neighbors. All you need is a permit from the state veterinarian and a state water quality plan.

Department of Agriculture Commissioner James Comer attended the field day and voiced his support for a project that he calls "very crucial" to livestock producers, especially in areas that have no removal programs.

Woodrum is able to provide this multi-county composting service with funds he was awarded from the Department of Agriculture.

"Dead animal disposal is a problem that effects Casey County and all Kentucky counties," said Woodrum. "This composting method is a green solution that is a very safe and cost-effective way to address this issue."

The Casey County Conservation District also is approved to receive an environmental grant through Kentucky's

cost-share program that will help reimburse livestock owners for their dead animal pickup expenses.

"Since Casey County lost its animal disposal service several years ago, the conservation district has worked to find a solution to this important environmental issue," said Lonnie Mullins, chairman of the Casey County Conservation District. "Thanks to funding from the Kentucky Division of Conservation environmental grant, the district will be able to offer a 50 percent cost share program to Casey County farmers who use this service in an effort to promote this successful project and protect the natural resources in our county."

Kentucky Division of Conservation Director Steve Coleman said districts should take advantage of all sign-up periods to apply for environmental grant funds.

"This money can be used for various projects that help reduce agricultural nonpoint source pollution of surface and groundwater," Coleman said. "It's all about educating the public and providing effective alternatives to old-school farming methods. It's evident from Woodrum's composting operation that landowners can adopt new techniques that produce a valuable service for themselves and others in their neighboring communities."

For more information on livestock composting in Casey County, contact the Casey County Conservation District at 606-787-2017. For information on Kentucky's cost-share program, contact your local conservation district or the Kentucky Division of Conservation at 502-573-3080.



Department of Agriculture Commissioner James Comer (left) addresses landowners and representatives during the Casey County Composting Field Day in October. Division of Conservation photo

High-performing schools in Kentucky

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the next logical step for the district's new elementary school project was net-zero energy building.

With the help of American Recovery and Reinvestment Act (ARRA) funds, DEDI contributed to the purchase and installation of a renewable energy source—a 349 kilowatt solar panel array that converts the sun's energy into electricity. Since opening its doors in 2010, Richrardsville Elementary has been operating at net-zero energy. The district has reported the school actually earned more than \$34,000 in the past year from the Tennessee Valley Authority, selling excess electricity generation back onto the grid.

The integration of high-performance building systems will create a school that is an asset to its occupants, district and entire community.

"Designing Richrardsville Elementary to be a hands-on learning environment

throughout the entire school is one of those ideas you reflect on in hind-sight and think: 'wow, that was such a great idea,'" said Joanie Hendricks, public relations coordinator for Warren County Public Schools. "In creating a school that dually functions like an energy museum, we are constantly saturating our students with ideas and knowledge so they understand not only the significant features that make their school net-zero energy, but also how their behaviors can impact the energy efficiency and community around them."

Deep budget cuts have affected most of Kentucky's K-12 school districts. Administrators in Kentucky have learned high-performing buildings help save money by reducing energy usage and providing a healthier environment for teachers, students and staff. Realizing education is the way to motivate change, DEDI partnered with Kentucky National Energy

Education Development (KY NEED) to sponsor the annual High-Performance School Buildings Workshop. The workshop provides participants an opportunity to learn about the foundation and benefits of building a high-performance school and also the chance to tour the school buildings.

A priority of DEDI is enhancing energy education in Kentucky school districts. In 2010, DEDI was able to expand the Energy in Education Collaborative to provide opportunities to share information and resources; promote energy efficiency education for high-performance building design; and improve building operations. The collaborative has been able to create a statewide network of energy professionals to establish energy performance as a core value in school districts.

The Energy in Education Collaborative involves the School Energy Managers Project, the Kentucky Energy Efficiency Program for Schools, the KY NEED and the Kentucky Green and Health Schools Program.

Maxey Flats project nears completion

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project manager at Maxey Flats. "The staff works hard to maintain a trusting relationship with the neighboring landowners, and our continuous open door policy gives residents peace of mind that all concerns are answered honestly by site staff. Meticulous upkeep of lands both on and off-site shows that the staff cares about the project and the community."

Billy Thompson, a lifelong resident of the area, is relieved to know that the project will soon be completed, but says he has never been scared to live there.

"I've lived near the project site for 15 years, but I've never had the concerns that others have had living so close to it," said Thompson, whose property borders Maxey Flats. "My wife used to work there so I'm very familiar with it. In fact, I've known Jeff Stamper for a long time and feel that he and the staff look out for our safety. I just built a new house and have no intentions of going anyplace else."

Last year, the Kentucky General As-

sembly approved funding that allows for the Final Closure Period of the project in accordance with the U.S. Environmental Protection Agency (EPA). The Finance and Administration Cabinet will hire an engineering firm to design the final cap, which will further prevent infiltration and erosion at the site and provide an additional barrier between the waste and site workers and the public. It is anticipated that an engineering firm will be selected in January 2013 and design work will begin.

"This is the biggest cleanup project the state has ever conducted, with an appropriation of \$35 million," said Tim Hubbard, assistant director of the department's Division of Waste Management. "We're excited about entering the Final Closure Period, but we know there will be challenges given the size of the project. The department's first goals are safety of the public and of those who work on the project while also protecting the environment. The project will require an unprece-

dent level of cooperation between sister agencies of the Commonwealth, the EPA and our contractors. But, we all share the same goal—to protect human health and the environment, now and for generations to come," Hubbard said.

Even after the final cap is installed, the department will continue to manage and monitor the site into the foreseeable future.

"Because of the long-lived nature of radioactive contaminants, we will have to monitor the entire area for many years," said Hubbard. "However, this site can offer many positive possibilities in the future—it could become an environmental education learning site for local schools and colleges, a training site for various agencies that deal with hazardous waste issues and it is already proving to be a valuable refuge for wildlife in the area."

To learn more about the project, go to <http://waste.ky.gov/SFB/Pages/MaxeyFlatsProject.aspx>

Three-tier consumer notification

EPA requirements for water utilities help protect public health following a violation

By Allison Fleck
Division of Water

The 461 public water systems across the Commonwealth consistently deliver drinking water that meets standards set by the U.S. Environmental Protection Agency (EPA) and the Kentucky Division of Water (DOW). These systems test regularly for 91 contaminants to make sure no contaminant is present at levels that may pose a risk to human health. Water suppliers serving the same customers summarize this information in an annual report that provides consumers with a snapshot of their everyday water quality.

Unfortunately, water quality can sometimes change. Despite the best efforts of water suppliers, problems with drinking water can and do occur. When a problem with drinking water happens, the people who drink the water have a right to know what happened and what they need to do. Requirements of the Safe Drinking Water Act dictate that water suppliers provide public notice to consumers if there is a problem, especially in emergencies and in language that is concise.

As water suppliers test their water, they may discover that levels of certain contaminants are higher than the standards set by EPA or DOW. This might happen due to a change in local water conditions, heavy rainstorms or an accidental spill of a hazardous substance. Water suppliers may also fail to take one or a series of their required samples. Any time a water supplier fails to meet all EPA and state standards for drinking water (including missing required samples or taking them late), the water supplier must inform the people who drink the water.

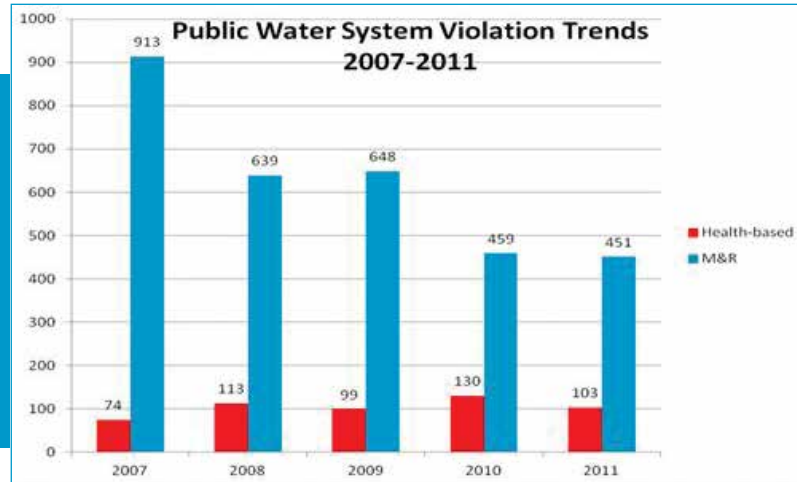
Depending on the severity of the situation, water suppliers have from 24 hours to one year to notify their customers after a violation occurs. EPA specifies three categories, or tiers, of public notification. Depending on what tier a violation/situation falls into, water systems have different amounts of time to distribute the notice and different ways to deliver the notice.

Immediate Notice (Tier 1): Potential for human health to be impacted immediately; notification must take place within 24 hours via media outlets such as television, radio and newspapers as well as posting in public places or personal delivery of notification.

Notice as soon as possible (Tier 2): Levels of a contaminant exceed standards but pose no immediate risk to human health requires notification within 30 days via the media, public posting or mail.

Annual Notice (Tier 3): Violation of a drinking standard with no direct impact on human health. For example, failure to take a required sample on time requires notification within the year via the annual water quality report.

Kentucky has seen a five-year decline in violations issued to public water systems. The majority of those violations have involved monitoring and reporting issues (M&R) rather than risks to human health (health-based).



Each public notification must address 10 points:

- Description of the violation or situation
- When the violation or situation occurred
- Potential health effects
- The population at risk
- Whether alternate water supplies should be used
- Actions consumers should take
- What is being done to correct the violation or problem
- When the system expects to return to compliance
- Name, address and phone number for more information
- Standard distribution language

In Kentucky, the number of violations issued by DOW to public water systems has declined steadily for the last five years. It should be noted that this has occurred during a time when the EPA promulgated six new drinking water regulations. This is significant because it shows that the public water systems continue to operate effectively while making adjustments in procedures and techniques to make sure they are adhering to the new regulations.

The DOW tracks all violations issued to public water systems. Within 10 days of issuing a public notice, the water system must submit to DOW a form certifying that public notification was performed. Julie Roney, coordinator of the DOW Drinking Water Program, said public water systems themselves are best-positioned to notify their customers when a potential health risk exists.

“The public notification requirement provides utilities the opportunity for water systems to educate their consumers and build trust through open, honest sharing of information,” said Roney. “Notices used in this positive way help consumers understand the basis for rate increases that may be needed for additional drinking water treatment and protection.”

KDF tests new forest fire reporting system

By Lynn True
Division of Forestry

As fall forest fire season comes to an end, fire management staff with the Kentucky Division of Forestry (KDF) will be busy assessing the effectiveness of a new internal reporting system that allows employees to identify and map forest fires in ‘real time.’ The web-based reporting system not only allows KDF dispatchers to enter new forest fires as they are reported, it enables all KDF employees to quickly access useful maps and daily fire conditions.

“Wildfire reporting helps assess wildland fire issues such as the location of the fire, the cause, the number of acres involved and the status of suppression efforts,” said Steve Kull, assistant director for KDF. “We still have a few procedural bugs to work out, but being able to evaluate our wildfire suppression efforts as fires occur will enable the division to better protect life and property.



A map in the new fire reporting system shows fire activity in southeast Kentucky. KDF photo

“The new system will not only increase the efficiency of collecting and reporting the most up-to-date information about wildfires, it will be a useful tool in determining fire suppression efforts,” said Kull. “The various layers of the maps allow our personnel to assess terrain, slope, roads and other critical factors in fighting wildland fire.”

Prior to the new reporting system, it was difficult for KDF employees to keep current on all the fires occurring across the state. Collecting information about current forest fire activity often involved

numerous phone calls and e-mails between the Frankfort office and the district offices. Furthermore, relaying accurate information to the media and the public was often compromised during times of heavy fire activity.

“From a fire manager’s perspective, this is an incredible tool that will allow our agency to receive updates on fire threats as they are occurring,” said Luke Saunier, KDF’s fire management chief. “Now we can look at the fire activity across the state and see exactly where our resources are needed the most.”

The concept for developing the system was initiated by Roy Boggs, KDF geoprocessing specialist and Tony Sturgill, geoprocessor principal for the Division of Information Services (DIS). Marvin Terry, DIS information systems manager, developed the application.



Black locust (*Robinia pseudoacacia*).
Courtesy of the College of Arts and Science
Bioimages, Vanderbilt University

Trees for honey bees

Pollination is key to the continuing life cycle of our landscape trees and forests. The process requires a “carrier” of pollen, most often wind or animals, to complete pollination and fertilization that leads to the growth of fruit and seeds.

Earth Day Award recipients Robert and Adriana Lynch of Whitley County planted 4,000 hardwood trees on their farm, including “honey bee” trees that are friendly to pollinators. Because of the environmental benefits that bees provide, this improves crop health for their neighbors in Corbin and beyond. The Lynch family suggests the following bee-friendly species that do well in Kentucky:

- Yellow Tulip Poplar
- Black Locust
- Persimmon
- Hawthorn
- Black Tupelo

- Linden/Basswood
- Golden Rain Tree
- Sourwood
- Catalpa

“We planted most of these species in our tree farm,” said Robert Lynch.

“Monitoring indicates that honey bee (and other bee) activity for these trees is high. In addition, honey bee activity for other plants (garden and wild) would appear to be much increased.”

The first four tree species listed are available as seedlings from the Kentucky Division of Forestry. You can obtain an order form at <http://forestry.ky.gov/statenurseriesandtreeseedlings/Pages/default.aspx>

The Kentucky Environmental Quality Commission presented the Earth Day Award to Robert and Adriana Lynch in 2012.

Awards

Environmental Excellence Awards presented by Kentucky DEP

By Mary Jo Harrod
Division of Compliance Assistance

The Kentucky Department for Environmental Protection (DEP) honored six recipients of its 2012 Environmental Excellence Awards during an awards luncheon at the Governor's Conference on Energy and the Environment at the Hyatt Regency Hotel in Louisville. Through this awards program, the department recognized the efforts and activities of individuals, businesses or organizations that are committed to protecting and improving Kentucky's environment.

"With this awards program, part of the Kentucky Department for Environmental Protection's mission to protect and enhance Kentucky's environment, the department recognizes some of the environmental leaders in the Commonwealth and highlights their achievements," said R. Bruce Scott, DEP commissioner. "Their efforts are an inspiration and encouragement to others to protect and conserve our precious resources."

The awards recipients are as follows:

- **KY EXCEL Champion Award:** **Leggett & Platt-Winchester Spring in Winchester** has implemented a variety of programs, emphasizing recycling, energy efficiency, employee input in environmental issues, waste reduction, composting, reusing parts and decreasing water usage.



Herbie Jones (left) and Chuck Cohenour accept the KY EXCEL Champion Award.

- **Community Environmental Luminary Award:** **The Arboretum, State Botanical Garden of Kentucky in Lexington** programmed more than 100 environmental events, offered adult and children's environmental education programs and provided The Children's Garden, a 1.85-acre outdoor learning environment designed for children ages 2-10.

Marcia Farris accepts the Community Environmental Luminary Award.



- **Resource Caretaker Award:** **Matthew Addison of Louisville** has spent the past 10 summers picking up and properly disposing trash and tires along a two-mile stretch of the Little Barren River. Matthew, a student at Trinity High School, has received numerous awards for his efforts, including the Kentucky Energy and Environment Cabinet's first Young Environmentalist Award, and been the subject of many newspaper and magazine articles.

- **Environmental Pacesetter Award for an Individual/Organization:** **Meg Hancock of Paducah** proposed (three years ago as a sixth-grader) that Paducah Middle School begin a recycling program. Through her efforts, the school recycles plastic, cardboard, aluminum, glass and paper. Now an eighth-grader, Meg has organized a "Green Team" that picks up trash at community functions. She was also named Kentucky's top middle school volunteer of 2012 by the Prudential Spirit of Community Awards.

- **Environmental Pacesetter Award for a Small Business:** **The Bread Box in Lexington** is a former brownfield that was cleaned up, renovated and now houses companies and nonprofit organizations that share the developers' commitment to the community, environment and neighborhood. The complex houses West Sixth Brewing, Broke Spoke Community Bike Shop, Food Chain, Cricket Press, artist studios and Roller Girls of Central Kentucky.



Joe Kuosman receives the Environmental Pacesetter Award for a Small Business.

- **Environmental Pacesetter Award for a Medium to Large Business:** **G & J Pepsi-Cola South Division of Lexington** implemented a sustainability program in its Kentucky operations, concentrating on recycling and energy efficiency that has resulted in a 47 percent decrease in energy

usage in coolers and 59 percent reduction in energy use in vending equipment. More

fuel-efficient vehicles have been purchased and a "no-idle" policy implemented.



Farley Schalk accepts the Environmental Pacesetter Award for a Medium to Large Company.

Photos by Creative Services

Awards

Energy Leadership Awards presented during conference

During the 36th annual Governor's Conference on Energy and the Environment, those in the Kentucky energy field were recognized for making tremendous impacts by promoting energy efficiency and for exploration and usage of alternative energy sources.

"The innovative and visionary leaders honored have played an integral role in shaping Kentucky's energy future," said Energy and Environment Cabinet Secretary Len Peters. "Through their energy initiatives, they have demonstrated commitment to protecting the environment, conserving natural resources and setting examples of environmental stewardship for generations to come."

The following recipients were awarded the Energy Leadership Awards:

- **United States Playing Card Co. (USPC)**—the company produces and distributes playing cards and other games. Sustainability efforts at USPC have been steadily gaining momentum since 2010, when the facility enrolled in the Save Energy Now Program, with the goal of achieving costs savings through energy efficiency and waste minimization. With the development of an Energy Management Program and an energy team, the company has been successful in implementing an equipment and lighting shut-down program through weekend audits to identify shut-down opportunities and communicating those results to department managers. By implementing cost-savings initiatives such as tariff rate changes, lighting upgrades, compressed air system optimization and reusing paper roll cores, USPC's sustainability efforts have resulted in annual energy costs savings of more than \$290,000.

- **Kentucky Highlands Investment Corp. (KHIC) and Southern Tier Housing Corp.**—KHIC's mission is to create better living opportunities for residents in 22 eastern and southern Kentucky counties. KHIC uses a develop-

mental venture capital approach to invest loan and equity capital in startup, emerging and expanding small business to create jobs. One demonstration project is the Near Zero Energy Home development in Whitley County that includes five homes coordinated and managed by Kentucky Highlands and its development partner Southern Tier Housing Corp. These energy-efficient homes have integrated the best building materials, technology and methods recommended by researchers from the Oak Ridge National Laboratory and the University of Kentucky to achieve sustainability.

"The bottom line is that the KHIC and Southern Tier are helping five families not only have a mortgage payment about equal their previous rent, but they also have no, or nearly no, power bill for the long term," said Secretary Peters. "Their history of energy-related business development shows further commitment to advancing Kentucky's energy independence goals."



(left to right)
Ray Moncrief, Kentucky Highlands Investment Corp.; Secretary Len Peters and Thomas Manning-Beavin, Southern Tier Housing Corp.
Creative Services photo

Student nominations sought for Eco-Art Contest

By Mary Jo Harrod
Division of Compliance Assistance

Calling all high school students! Let us see your creativity. The Kentucky Department for Environmental Protection (DEP) is soliciting nominations for the 2012–13 Eco-Art Contest, which provides an opportunity for students to gain statewide recognition for their artwork as it relates to the environment. Used as a tool for environmental education, art supports DEP's mission to protect Kentucky's environment.

Multiple awards will be presented to eligible Kentucky high school students who create art using the contest themes or categories of conservation, pollution prevention and environmental protection. Students may submit artwork using the media types of drawing/painting/print, mixed media, sculpture and photographs, with one winner for each submitted art type within each category.

"Our goal with this contest is to heighten awareness of the importance of protecting our environment by inspiring students, our future leaders, to reflect their thoughts through their art," said R. Bruce Scott, DEP commissioner.

Artwork from previous years' contest winners is displayed in the DEP Training Center in Frankfort, where it has been viewed by hundreds of visitors.

Contest nominations are being accepted until COB, March 15, 2013. All nominations must be sent to envhelp@ky.gov. A digital picture of each artwork nomination must accompany each form submitted. Eligible students include all students enrolled in Kentucky public and private high schools for the 2012–13 academic year. Winners will be notified during Earth Week in April, and winning entries will be displayed in the DEP Training Center at 300 Fair Oaks Lane.

For more information and to access a nomination form, visit <http://dca.ky.gov/LGGS/Pages/ecoart.aspx> or call toll free 800-926-8111.



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Seedling nurseries: growing trees for healthy and productive forests



Sassafras, also known as white sassafras, is a medium-sized, moderately fast growing, aromatic tree with three distinctive leaf shapes—entire, two-lobed and three-lobed.

Found throughout Kentucky, it frequently pioneers in old fields where it is important to wildlife. The soft, brittle, light-weight wood is of

limited commercial value, but the oil of sassafras is used in the perfume industry. Sassafras seedlings are available from early fall to early spring from the Division of Forestry's nurseries. Orders are shipped at your request for planting projects during the dormant period throughout the winter. To obtain an order form, visit <http://forestry.ky.gov/statenurseriesandtreeseedlings/Pages/default.aspx> or call the Division of Forestry at 1-800-866-0555.

Just the Facts: Sassafras (*Sassafras albidum*)

- **Growth:** Sassafras trees grow from 50 to 120 feet tall and 2.5 to 6 feet in diameter. Sassafras typically have many slender branches and smooth, orange-brown bark. The bark of mature sassafras is thick, red-brown and deeply furrowed. The species are unusual in having three distinct leaf patterns on the same plant, unlobed

oval (entire), two-lobed (mitten-shaped) and three-lobed, and the young leaves and twigs produce a citrus-like scent when crushed. Flowers are tiny, yellow, five-petaled and bloom in the spring. The fruit are dark blue, about one-half inch long and mature in late summer.

- **Range:** Sassafras is a native species throughout eastern North America and can be found from southernmost Ontario, Canada through the eastern United States south to central Florida, and west to southern Iowa and eastern Texas.
- **Sites:** Sassafras can be found on virtually all soil types within its range, growing best in open woods on moist, well-drained, sandy loam soils, but also as a pioneer species on abandoned fields, along fence rows and on dry ridges and upper slopes.
- **Human Uses:** Sassafras wood is used for buckets, posts and furniture. Sassafras is also a good choice for restoring depleted soils in old fields. Although the root bark and twigs have been used to flavor tea, root beer and candy, the oil contains safrole, which has been shown to be carcinogenic in rats and mice. As a result, the Food and Drug Administration has prohibited the use of safrole and sassafras bark in food.
- **Wildlife Uses:** The leaves and twigs are eaten by white-tailed deer, rabbits and woodchucks. The fruit is eaten by many birds including woodpeckers, wild turkey and mockingbirds.
- **Tree Trivia:** Sassafras is allelopathic to some plants. This means it releases a chemical that keeps other plants from growing well, thereby lessening its competition for sunlight and nutrients.