

Land Air & Water



Kentucky Energy and Environment Cabinet

Volume 23 Number 1
Winter 2012

Land Air & Water

since 1988

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Land, Air & Water is published quarterly
by the Energy and Environment Cabinet.
Subscription to this publication is free.

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From the Secretary's Desk

As we start the New Year, I've been doing what most of us tend to do—reflecting on the past several years and thinking about what the coming year might look like. Governor Beshear created the Energy and Environment Cabinet almost four years ago to make sure that we develop our energy resources in an environmentally sensitive manner and use our energy resources as a tool for economic development. When the cabinet was first created, this combining of energy and environment programs was a relatively new concept for state governments. Since that time, a few other states have adopted similar structures for their programs, including recently, Connecticut.



Energy and environment are becoming more closely linked in discussions outside of state government agencies as well. This interconnection does not depend solely on issues surrounding climate change, although climate change concerns most certainly were initial drivers. I mentioned in the previous issue of *Land, Air and Water* that national environmental policy is driving energy policy. I'd like to elaborate on this point and make a few observations as this continuing *de facto* policy will influence Kentucky, and the nation.

First, in the absence of a federal energy policy, the states and regions are filling the void. Kentucky is among those states. I've been pleased with the expanding discussion among people in the executive branch, the legislative branch, private industry, academia and the environmental community. A few examples: Governor Beshear's Task Force on Biomass Development; a recent initiative of the Energy and Environment Cabinet called SEE Kentucky (Stimulating Energy Efficiency in Kentucky); a conference in December sponsored by the Kentucky Chamber of Commerce focusing on energy management; and Kentucky's Climate Action Council, which recently released recommended policy options. These are all important and necessary initiatives, and the dialogue among the stakeholders within the various sectors must continue.

Unfortunately, state-led actions cannot overcome many of the factors that are affecting us as a result of federal actions, and in some cases, lack of action. We have much at stake, as a state and as a nation. A statement made during the Kentucky Chamber conference really resonated with me. The speaker remarked that we are not losing the renewable energy race to China, we are losing the entire energy race, and this situation

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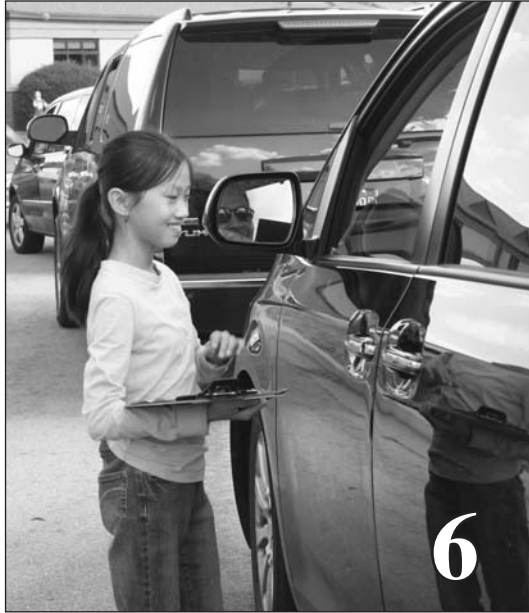
Correction: On Page 17 of the fall issue, we misspelled the name of KDF firefighter Adam Michels. It should also be noted that Michels volunteered for two assignments.

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Printed on recycled paper with state and federal funds.

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The classic pose of a White-breasted Nuthatch (*Sitta carolinensis*) as it circles its way down a tree in search of food. Photographed by Ellis Lauder milk, Kentucky State Nature Preserves Commission.



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Printed by Post Printing
Lexington, Kentucky

Landmark celebration

The Kentucky State Nature Preserves Commission (KSNPC) celebrated its 35th anniversary this summer. A special ceremony was held on Sept. 8 in the Capitol Rotunda to reflect on the commission's accomplishments, as well as the people who have made the commission what it is today.

It began in July 1976 when Gov. Julian Carroll signed legislation authored by the late Jon E. Rickert creating a commission that would protect Kentucky's best natural areas and educate the public about the value of the state's rare species and natural communities.

During three and a half decades, 60 state nature preserves have been established, beginning with its flagship preserve Blanton Forest that encompasses more than 2,300 acres of old-growth forest and most recently with the addition of Blood River State Nature Preserve that protects the Blood River crawfish found nowhere else in the world.

"The work of the commission has had a tremendous positive impact on our state," said Don Dott, executive director of KSNPC. "From Blanton Forest near the Virginia border to Three Ponds on the banks of the Mississippi River, our nature preserves cover more than 25,000 acres of Kentucky's natural heritage."

To date, field biologists have compiled more than 12,000 records of rare species, natural communities and conserved lands. Within the last couple of years, two plant and two animal species, as well as two invertebrate species new to science and never before documented in Kentucky or in scientific literature were discovered.

"You will find some of Kentucky's best gems in the state nature preserves, and I strongly encourage you to get out and visit them," said Carl Breeding, commissioner and chair of the KSNPC, referring to the preserves open to the public for hiking and wildlife observation.

These "gems" are also highlighted in a book recently published by the commission titled "Kentucky's Natural Heritage: An Illustrated Guide to Biodiversity." It features a foreword by Wendell Berry and more than 250 color photos, maps and charts that showcase a collection of the Commonwealth's fascinating diversity. It is available from the commission, most local bookstores and online.

Highlights of the anniversary celebration are available on the commission's website at <http://naturepreserves.ky.gov/Pages/default.aspx>.



TOP: *Blanton Forest.* Cabinet photo
ABOVE: *White lady's-slipper (Cypripedium-candidum).* Thomas G. Barnes photo
BELOW: *Gov. Julian Carroll signs the act creating the commission as Jon Rickert looks on.* Cabinet photo



Contributions from Commission Directors

- **Donald F. Harker Jr.**—served as the first director and used grants to hire field biologists to perform inventories of the state, laying the groundwork for the rare species database and a nature preserve system.
- **Richard Hannan**—led the commission from 1982 until 1992. His tenure brought the first appropriation of funds from the General Assembly to purchase nature preserves. Prior to 1990, the commission dedicated state park properties and used funds from various sources and matched grants with land donations to purchase 18 preserves. The Natural Areas Inventory began in 1988, and appropriations were spent on high-quality sites that were the first fruits of the inventory process.
- **Robert McCance**—served from 1993 until 1997 during which time the Rare Plant Recognition Act was passed. The commission also closed on the first tract at Blanton Forest State Nature Preserve. In 1995, the first nature license plate became available providing the commission with its first regular funding for the acquisition of natural areas, resulting in the acquisition of new preserves and key additions to existing preserves.
- **Donald S. Dott Jr.**—fourth director appointed in 1998 and has served for the last 13 years. Under his direction, the commission moved ahead with Geographic Information System technology, and in 2001 proclaimed the acquisition of preserves from one end of the state to the other with the purchase of 215 acres on the Mississippi River.

Taking concrete steps to strengthen Fox Creek Dam

Article and photography by Allison Fleck
Division of Water



TOP and ABOVE: Tony Grubbs (center) with Schnabel Engineering LLC describes the process of producing roller-compacted concrete in the rapid mixer facility and explains the stepped dam design to DOW engineers (from left) Gary Wells, Glen Alexander and Mortaza Rabiee.

A \$4 million rehabilitation of Fox Creek Multiple Purpose Structure No. 4 in Fleming County has transformed the former earthen barrier into an innovative stepped concrete structure designed to meet high-hazard dam safety requirements and extend its life into the next century.

The original Fox Creek dam was constructed in 1968 by the Fox Creek Watershed Conservancy on Sand Lick Creek approximately eight miles upstream of its confluence with Fox Creek. It was designed as a Class B, or moderate-hazard, multiple-purpose structure to provide flood protection and recreation at the 75-acre Fox Valley Lake it forms.

In actuality, the dam should have been classified as high hazard from the start due to the presence of residences downstream, said Gary Wells, a dam safety engineer with the Division of Water (DOW). Dams are rated as “high hazard” when failure

may cause loss of life or serious damage to houses, industrial or commercial buildings, important public utilities, main highways or major railroads.

“In 1988, the Natural Resources Conservation Service documented that the structure was misclassified during the planning and design phase and should have been designed as a high-hazard structure because of the existence of residential structures downstream,” said Wells, who reviewed and approved the project modification plans.

In April 2006, the Fox Creek Watershed Conservancy District, which owns the dam, had the Natural Resources Conservation Service conduct a full breach analysis and concluded that 17 residential structures downstream would be flooded above their first-floor elevations if the dam failed. There was also concern about the condition of the vegetated spillway, which had experienced weakening due to chronic

overtopping, as well as deterioration of the upstream drawdown valve.

Financing would prove a stumbling block to modifying the dam until 2009, when the federal government’s stimulus program made funding available for water infrastructure projects. The American Recovery and Reinvestment Act (ARRA) of 2009 was part of the Obama administration’s plan to modernize the nation’s infrastructure, jumpstart the economy and create jobs. The goal of the federal dam rehabilitation program was to provide funding toward the most cost-effective projects where there is the greatest risk of infrastructure failure and threat to life and property.

In April 2009, project co-sponsors Fleming County Fiscal Court and Fox Creek Watershed Conservancy District were notified that Fox Creek Dam had

Continued on Page 4

New and improved UST regulations

Major changes that
“made the cut”

By Virginia Lewis
Division of Waste Management

Measure twice, cut once—after four years in the development stage, new and improved underground storage tank (UST) regulations are here. What major changes made the final cut?

Previous regulations had to be revised to incorporate the UST-related requirements of the Federal Energy Policy Act of 2005. Secondary containment, delivery prohibition and operator training rank top on the list as being the most sweeping changes, with the primary focus being leak prevention. Other changes (unrelated to the Energy Act) that will expedite the cleanup process and streamline the reimbursement procedures also made the cut.

Secondary Containment

This term refers to the use of tanks, piping and spill buckets that are double-walled. It is akin to double bagging groceries—if the inside bag fails, the outside bag (the secondary containment) will be there to catch everything. Requiring this second layer of protection on tanks, piping and spill buckets will go a long way in preventing leaks into the Commonwealth’s groundwater and soil. Unlike the “don’t wait until 1998” upgrade requirements, which required federal UST standards to be implemented by a specific date, the changes associated with this federal (and now state) requirement will gradually take place. Per the regulation, new or replaced tanks, piping and spill buckets installed after April 1, 2012, must be designed and manufactured with double-walled construction.

Delivery Prohibition

“Prohibition” may conjure up thoughts of bootleggers and barrels of alcohol, but this time the federal prohibition requirement is about fuel delivery. There are two major cases in which the decision



Installation of an underground storage tank in Kentucky. Photo by Division of Waste Management

can be made to disallow “fuel drops” to USTs:

1. If individual tank systems are not in compliance with the long-standing leak prevention requirements for spill prevention, overflow prevention, release detection, and corrosion protection; and
2. If a leaking tank system is not repaired or replaced.

These UST systems are at an increased risk for or are already polluting the Commonwealth’s resources. Prohibiting the delivery of fuel to these at-risk or failing UST systems is an important measure of protection for human health and the environment.

Operator Training

Another key federal requirement (now incorporated into state regulations) will take Kentucky UST operators back to school. The required training is focused on operating and maintaining UST systems—another important measure for preventing releases. In Kentucky, this training will be site-specific, meaning that UST operators will only have to receive training on the operation and maintenance of their specific UST systems. The training will also be web-based and free. If an operator has no Internet access or only has access to a dial-up connection, they may contact their nearest Division of Waste Management regional office for Internet access or video conference with staff in Frankfort if direct assistance is needed. The regulation (401 KAR 42:020) states that the owner

or operator shall ensure that all employees associated with the operation of the UST system receive training by Aug. 8, 2012, and every 12 months thereafter. The web-based training is in the development stage. Watch the UST Branch website at <http://waste.ky.gov/ust> for updates and an expected availability date.

Expediting the Cleanup Process

This involves two major areas of considerations for most UST owners and operators—how the contamination is cleaned up (methods, technologies, etc.) and how the cleanup is financed.

The new regulations will allow for a reduction in time that a contaminated UST facility spends in the site investigation phase. Less time in this phase means cleanup can begin more quickly. The new regulations also allow for the employment of new and more technologically advanced approaches to the actual cleanup of the contamination.

Another intertwined factor for most UST owners and operators is the financial aspect of cleanup. Kentucky has the Petroleum Storage Tank Environmental Assurance Fund that provides financial assistance to owners and operators in the cleanup of petroleum contamination from their USTs. The new regulations allow for streamlining of the reimbursement procedures by reducing the amount of paperwork and review by converting to a more fixed-cost approach for new directives.

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Taking concrete steps to strengthen Fox Creek Dam

Continued from Page 2



FAR LEFT: Workers with Schnabel Engineering perform a balancing act while tying steel panels for a well form prior to pouring concrete.



LEFT: A chiller and generator are positioned beside the aggregate piles to be cooled. Photos by Allison Fleck

been selected to receive more than \$4 million in ARRA money to fund the remedial dam work. The 10 percent required matching funds were provided by the Department for Local Government.

The most obvious feature of the new dam is the series of five steps stretching the width of the dam and measuring 4 feet high and 10 feet wide. The four-foot step height has several advantages, said Tony Grubbs, dam project director with Schnabel Engineering LLC, the company awarded the modification contract.

“Flowing water creates a great deal of force,” said Grubbs. “The steps will dissipate energy by slowing down the water as it flows over the dam. Another benefit of the steps is that they will make it difficult for people to climb on the dam—an important consideration because of its proximity to a recreational area.”

Schnabel Engineering analyzed possible alternatives to address the spillway capacity issue at Fox Creek Dam. After studying a range of options, the stepped design was selected over a more traditional ramp spillway.

“DOW regulations did not allow use of a ramp spillway, which is basically a skin of concrete over an earthen dam, because it hides deficiencies beneath the surface that can erode the dam,” said Wells.

Another innovative aspect of the project was the choice of a relatively new material called roller-compacted concrete, or RCC, which has the strength and durability of conventional concrete but at a cost that rivals earth or rock-fill construction. RCC has the same ingredients as conventional concrete—cement, water and aggregate—but it is much drier and can be placed quickly and easily with large-volume earth-moving equipment. Moreover, RCC can be walked upon immediately after placement versus a two-day wait with conventional concrete. It also has high resistance to the harmful effects of freezing and thawing.

Sections of the dam were built lift by lift in successive horizontal layers so the downstream slope resembled a concrete staircase. The RCC, which was mixed on-site at a continuous-mix plant, was deposited in 15-inch layers, which workers compacted to 12 inches using a paving machine. Once a layer of RCC was placed, it could immediately support the earth-moving equipment to place the next layer.

Grubbs said heavy rains and high heat during the summer construction months presented big challenges to construction.

“We had 60 inches of rain since we started this project and intense summer heat, but we were able to stay ahead of schedule overall,” said Grubbs, “For example, we positioned mobile spotlights on the crest of the dam allowing the crew to work many nights until 2 or 3 in the morning and avoid high daytime temperatures.”

High heat is hard on the crew, but it is also the bane of the concrete producer, according to DOW dam safety official and aggregate expert Mortaza Rabiee.

“The RCC in the mixer cannot exceed 80°F because of its rapid-set property,” explained Rabiee.

Because of the extreme summer temperatures, a chiller was delivered that circulated cold water through the aggregate pile. The rocks were also covered with a huge tarp to help maintain the cooler temperature.

When the dam is complete, an ogee (curved) crest along the width of the spillway at the center line will allow water to flow over the top onto a floor slab and then down the stepped section into the concrete stilling basin.

Wells said the Fox dam project represents a milestone in the way the state thinks about reconditioning dams.

“After a full review of all of the alternatives and analysis, DOW selected the roller-compacted concrete embankment design as a demonstration project for Fox Creek MPS 4,” said Wells. “It offers protection from heavier storm water flow and the specialized drainage system design may prove to be more effective in collecting potential seepage through the dam.

“I envision the dam becoming as much of a destination as the recreational lake it creates with the added benefits of offering better protection,” said Wells. “It really does represent a resourceful way of thinking about dam design and construction.”

Students study a sample specimen and collect water samples from Lake Jericho.

Photos provided by Larisa McKinney



Real-world, hands-on learning

Environmental grants give students the opportunity to get their feet wet and hands dirty learning the value of the preservation of natural resources

By Johnna McHugh
Division of Conservation

Students at Henry County Middle School have a better understanding and appreciation for conservation and their environment thanks to grants provided by the Henry County Conservation District and Little Kentucky River Watershed Conservancy District.

Larisa McKinney, an eighth-grade science teacher at Henry County Middle, was awarded the 2011 Marshall Banta Education Grant from the Henry County Conservation District. McKinney, along with a group of students, used the grant funds to plant greenery around their school during spring break. They hope current and future students will use the green areas as outdoor classrooms.

McKinney, along with fellow teacher Jessica Elliott, also received a Water Watch grant from the Little Kentucky River Watershed Conservancy District. McKinney and Elliott have received the environmental grant for three years. The funds, made possible by the Soil and Water Conservation Commission's Kentucky Soil Erosion and Water Quality Cost Share Program, support real-world, hands-on science labs that include newly purchased iPads and microscopes.

"These grants have really been able to help our kids experience first-hand what they're learning in the classroom," said McKinney.

"We appreciate the watershed and district boards for making these things possible."

As a result of these grants, the Henry County Middle School is the only science department in the region to have iPads available for every student to learn about watersheds, water facts, chemistry, ecosystems and other topics. In addition, the students learn to read topographical maps to study the entire watershed.

The grants also provided the resources for teacher Terry Petree and his sixth-grade students to perform classroom-based water testing using the microscopes to study algae, insects, indicator species, water clarity and other indicators of water health.

Field trips to Lake Jericho, a part of the Little Kentucky River Watershed, gave students the opportunity to conduct on-site water testing for pH, nitrogen, phosphorus, fecal coliform, turbidity, temperature and dissolved oxygen. Soil tests were also conducted for pH, nitrogen, phosphorus and potash.

These science experiences have definitely been money well spent in the eyes of McKinney and Elliott.

"Test scores have increased more than 20 points in the last three years," said McKinney. "Our middle school students have raised their collective academic index scores from 70 to 90 percent."

Student “green teams” work to clear the air

By Roberta Burnes
Division for Air Quality

“What can you do to improve air quality?” You might not expect a typical fifth-grader to be able to answer this question. But at Portland Elementary in Jefferson County, the answer comes easily to 11-year-old Autumn Logan.

“Walk or ride a bike to school or work,” she says. Fellow classmate Lilly Voigner agrees. “Make people aware of what they are doing. Get parents to turn off their cars while waiting to pick up students.”

Lilly and Autumn know this because they’re part of a growing number of students taking action to improve their school environment through the Kentucky Green and Healthy Schools program (KGHS). KGHS is a service learning program that empowers students to move their school toward becoming safer, healthier and more environmentally sustainable. This

inquiry-based program uses the entire school grounds as a learning laboratory for students.

Participating schools form a “green team” of students, teachers and school administrators who work together to improve the school environment in nine different categories such as energy, transportation and indoor air quality. For each category, students complete an inventory that assesses their school’s current

facilities and policies surrounding that topic. For example, students completing the indoor air quality inventory might learn about asthma triggers and strategize ways of reducing them in the classroom. Once an inventory is complete, students work together to design and implement an improvement project on their school grounds.

Bike to School Day

That’s what led the Green Team at Portland Elementary to initiate Bike to School Day. After conducting the transportation inventory, students noticed how many cars were lined up in the carpool

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RIGHT: *Fifth-grader Mia Sword encourages drivers to reduce unnecessary idling in the carpool lane at Rosa Parks Elementary in Fayette County.* Photo by Tammy Lane, Fayette County Public Schools

BELOW: *Students, parents and teachers celebrate Bike to School Day at Portland Elementary.* Photo by Brenda Stokes, Jefferson County Public Schools



Join Kentucky Green and Healthy Schools

The Kentucky Green and Healthy Schools (KGHS) program recognizes student and teacher teams for their efforts to improve their school across nine categories:

- Energy
- Green Spaces
- Hazardous Chemicals
- Health and Safety
- Indoor Air Quality
- Instructional Leadership
- Solid Waste
- Transportation
- Water

As students and teachers submit documentation for projects in each category, they are recognized through the KGHS awards system. Each May, the program hosts a Youth Summit in Frankfort, Ky., where more than 250 students and teachers present their work for the year, are provided lunch, and receive their awards.

All grade levels of all schools (even those being built) are invited to join KGHS. For more information, visit www.greenschools.ky.gov or call 1-800-882-5271.

Field trips and tours

Kentucky has surprising environmental education opportunities near you

By Mary Jo Harrod
Division of Compliance Assistance

Numerous possibilities abound for youngsters and adults looking to learn more about the environment. Many organizations are involved in environmental and stewardship projects that are open to the public. Visit the following Kentucky businesses and organizations to see how they are working to preserve and protect the state's land, air, water and fauna.

- **Sanitation District No. 1** in northern Kentucky has stormwater and wastewater field trips and tours at its Public Service Park, offering an outdoor environmental education center with interactive learning opportunities. Located on the banks of Banklick Creek, the park is an innovative facility that features many educational tools and best management practices. Structured field trips and tours are designed to enlighten visitors about the vital importance of protecting our waterways. The park's "Journey of a Drop of Water" field trip is the winner of the National Association for Clean Water Agencies 2005 National Environmental Achievement Award. Tours of the Dry Creek Wastewater Treatment Plant in Villa Hills and the Eastern Regional Water Reclamation Facility in Alexandria last about 60 minutes and are open to all middle- and high-school students and adults. For more information, visit http://www.sd1.org/Education/Field_Trips_and_Tours.aspx.

- **Toyota Motor Manufacturing Kentucky Inc. (TMMK)**, a major employer in Georgetown and manufacturer of the Toyota Camry, is the site of the Toyota Environmental Education Center and Nature Trail. Located near 50 acres of wetlands, prairies and woodlands, TMMK has created a mile-long nature trail that features native grasses, bluebird boxes and Kentucky cane and trail markers that identify the state's history and natural treasures. Picnickers will enjoy the covered pavilion as they commune with nature. For more information, visit <http://www.toyotageorgetown.com/enviro6.asp>.

- **Lafarge Silver Grove** in Campbell County consists of 200 acres, with 100 acres reserved as a wildlife habitat. The company made a commitment to protect the wildlife habitat and diverse ecosystem by implementing a nesting structures program and a variety of other wildlife habitat projects. Native grasses and trees were planted and labeled for identification and educational purposes throughout the property. A nature trail highlights the wildlife habitat projects. An on-site classroom is part laboratory, bird blind and part classroom with lab benches and educational materials on hand. The site staff, along with several community partners, works to create high-quality educational programs, including "Life Cycle of a Bee," where students observe an active hive; "Sustainability Tours," which highlight the Lafarge plant and how it works in cooperation



A student searches for macroinvertebrates at Cattail Lake that is part of TMMK's Environmental Education Center and Nature Trail.
Photo courtesy of Frances Jansen, TMMK

with the environment; and "Water Quality Testing," where students gather data about two on-site ponds and assess the quality for wildlife health. All curricula correlates to Kentucky State Standards and is written with the assistance of local teachers. For more information, visit <http://www.wildlifehc.org/registry/lafarge-67/>.

- **The American Cave Conservation Association** in Horse Cave has many programs for students and adults. The Caving Adventure Tour goes 150 feet off the beaten path and into the depths of Hidden River Cave to allow participants an opportunity to view the fragile cave ecosystem, formations and little-seen cave wildlife. Other tours and programs examine fossils from an ancient ocean, the karst landscape of south central Kentucky and the karst water cycle. For more information, visit <http://www.cavern.org/acca/programs.php>.

- **The Lexington Fayette Urban County Government Recycling Center** receives more than 100 tons of recyclable materials each day, where items are sorted into categories, bundled, shipped to various vendors and repurposed into new

KY EXCEL

Some of the organizations listed in this story are KY EXCEL members. KY EXCEL is the state's voluntary environmental leadership program. These organizations have committed to a variety of projects to improve and protect Kentucky's environment that go above and beyond any environmental regulation. Join KY EXCEL by calling 1-800-926-8111 or visit <http://dca.ky.gov/kyexcel/> for more information. The latest member to join is:

Master
Duke Energy East Bend Station—Union

Continued to Page 20

Regulated Combustion Sources

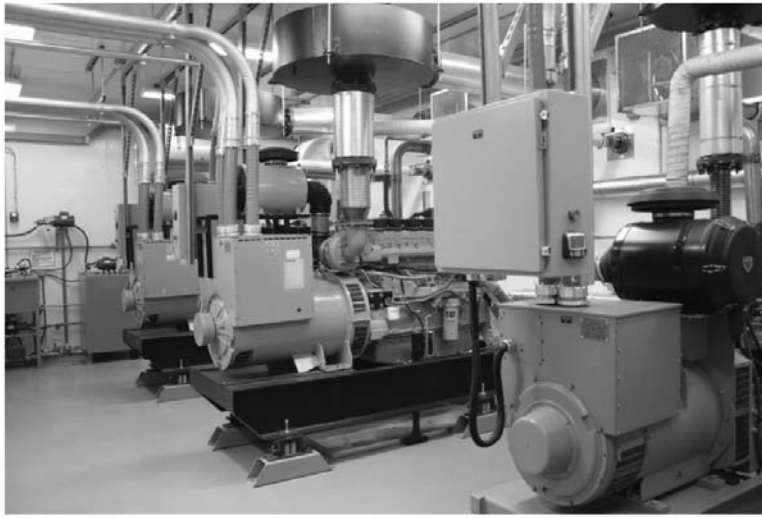
EPA rules will affect sources previously considered exempt

By Kenya Stump

Division of Compliance Assistance

Whether it is a boiler located at a school or a back-up emergency generator located at a wastewater treatment plant, combustion sources come in a variety of forms. These combustion sources, through the burning of fuel, emit pollutants including air toxics. In recent years, the U.S. Environmental Protection Agency (EPA), as part of its Urban Air Toxics Strategy, has issued regulations affecting these types of sources that may have previously been considered insignificant or “exempt.”

The National Emission Standards for Hazardous Air Pollutant (NESHAP) Area Source Rules focus on those sources that emit less than 10 tons annually of a single hazardous air pollutant or less than 25 tons annually of a combination of hazardous air pollutants. Such sources are often overlooked because of their physical location or the size and type of unit. For many people, air quality regulations are those that affect manufacturing facilities or other industrial activities, but these new NESHAP regulations can affect combustion sources located at facilities not traditionally thought of as air pollutant sources, such as hospitals, schools or municipal governments.



practice standards, as well as recordkeeping and reporting requirements. For more information on this rule, visit the EPA’s Combustion Portal at <http://www.combustionportal.org/rice.cfm>.

NESHAP Area Source Boiler Rule

40 CFR Part 63, Subpart JJJJJ

Industrial, commercial and institutional (ICI) boilers can use a number of different fuels, including coal (bituminous, sub-bituminous, anthracite, lignite), fuel oil, natural gas, biomass (wood residue, bagasse), liquefied petroleum gas and a variety of process gases and waste materials. These boilers are often used

to produce heat indirectly for uses in process machinery, as comfort heating, for hot water and steam for electricity. The NESHAP for area source boilers became effective May 20, 2011. For those sources affected by this rule, requirements may include compliance with emission and work practice standards, pollution prevention audits, testing, tune-ups, as well as recordkeeping and reporting requirements. For more information on this rule, visit EPA’s Boiler Compliance Web page at

<http://www.epa.gov/boilercompliance/>.

NESHAP Area Source RICE Rule

40 CFR Part 63, Subpart ZZZZ

A stationary reciprocating internal combustion engine, or RICE, is any internal combustion engine that uses reciprocating motion to convert heat energy into mechanical work and is not mobile. In general industry, these engines provide shaft power to drive process equipment, compressors, pumps, standby generator sets and other machinery. Agricultural uses are similar, with many engines driving irrigation pumps. Reciprocating engines find wide application in municipal water supply and wastewater treatment and in commercial and institutional emergency power generation. In 2010, the EPA amended existing regulations for these types of engines to include all horsepower engines located at area sources, but did exempt those engines under this regulation located at existing institutional, commercial or residential facilities. For those sources affected by this rule, requirements may include compliance with emission and work

If you are a source that thinks you may be affected by either the NESHAP Area Source RICE Rule or Boiler Rule, contact the Environmental Compliance Assistance Program at 800-926-8111 or via email at envhelp@ky.gov.

Other Reminders

The regulations are not inclusive of all combustion-related regulations that could apply to your facility. If you are a facility that has combustion sources, you are encouraged to evaluate all air pollution sources at your facility, even noncombustion sources, to determine if additional regulations apply and/or if you may need an air quality permit from the Kentucky Division for Air Quality. For information on the Kentucky Division for Air Quality, visit <http://air.ky.gov>. For assistance related to your regulatory obligations, visit <http://dca.ky.gov/compliance/assistance/pages/default.aspx> or email envhelp@ky.gov.

100 Years and Beyond

Kentucky Forestry Centennial

By Lynn True, Division of Forestry
Photographs provided by Division of Forestry



This year officially marks the 100th anniversary of the Kentucky Division of Forestry (KDF). Originally known as the Board of Forestry as established in 1912 by the Kentucky General Assembly, KDF is the oldest state forestry agency in the South.

“We intend to honor our past throughout the year with educational events, historical presentations and informational displays at fairs and festivals across the state,” said Leah MacSwords, director of KDF and 13th state forester. “We also want to use this occasion to look to our future.”

The division’s accomplishments are due in large part to its dedicated employees. From assisting landowners to suppressing wildfires, KDF employees have been the backbone of forest conservation in Kentucky. As we navigate the next 100 years, our foresters and rangers will need to prioritize projects and focus on critical areas in our state. Given that Kentucky has more than 12 million acres of forestland, this will be a difficult task for an agency with limited resources. With that in mind, we challenge generations to come to lend us a hand in protecting and conserving our forest resources. After all, it’s our legacy to the future.

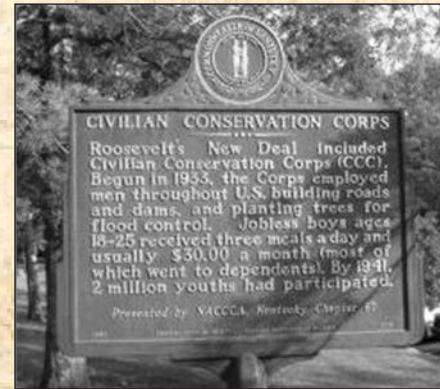
1912 ⇨

Creation of the Board of Forestry—By the early 1900s, Kentucky’s forests had been overharvested, cleared for agriculture and charred by wildfires. In response to the depleting resource, the Kentucky General Assembly in 1906 empowered a new Board of Agriculture, Forestry and Irrigation to act as a forestry commission for the state. The assembly also authorized the board to enter into contract with the U.S. Forest Service to conduct a forest survey in 1907. The survey found a deteriorating forest, and a report was written to recommend the creation of a forest agency headed by a technically trained and experienced forester. By 1912, the legislature passed a law to adopt the recommendations of the report and create a Board of Forestry. The new board—comprised of seven members— included Kentucky’s first state forester, John Earle Barton. Barton’s first projects were to establish a corps of county forest wardens, build a nursery to produce tree seedlings and begin reforestation in Kentucky.



1913

First Fire Protection Association—Under the guidance of the Board of Forestry, the first Fire Protection Association was organized in Harlan County. Landowners paid a yearly one-cent-per-acre forest protection tax, and by 1915 the area of protection encompassed 200,000 acres and extended to neighboring counties.



1914 ↓

First Tree Nurseries—Two state-owned tree nurseries were established to raise tree seedlings and create state forest reserves. The first and largest nursery was located at the fairgrounds in Louisville and a smaller nursery was created in Frankfort. Although both nurseries have since been replaced, the Louisville nursery produced as many as 25 million tree seedlings. KDF’s nurseries today are capable of growing 3 to 4 million seedlings annually.



1919

First State Forest—The Board of Forestry acquired its first state-owned property in Harlan County on the south side of Pine Mountain. It was deeded to the Commonwealth by the Kentenia-Cantron Corp. and subsequently named Kentenia State Forest. Initial tracts of land at Kentenia totaled 3,624 acres. Today, KDF owns and manages nine state forest properties encompassing more than 40,000 acres.

← 1933

Civilian Conservation Corp—The Great Depression of the 1930s, as devastating as it was to the nation, had a positive impact on forest and park development. One of President Franklin D. Roosevelt's New Deal programs was the Civilian Conservation Corps (CCC). From 1933 to 1942, CCC camps were established in every state. Among their duties, young men in these camps worked to reclaim forests by erecting fire towers, fighting forest fires and planting trees.



↑ 1944

Smokey Bear's Birthday—Smokey Bear was created as an advertising campaign of the Ad Council and the National Association of State Foresters to educate the public about the dangers of forest fires. The living symbol of Smokey Bear was an American black bear cub that survived the Capitan Gap fire in New Mexico in 1950. Smokey Bear has been the basis for KDF's fire prevention education program in schools since the 1950s.

"Only you can prevent forest fires!"

1964

Arbor Day in Kentucky Designated as First Friday in April—Established by the Kentucky General Assembly in 1896 as a day set aside for recognizing the importance of trees, the actual day changed several times until the 1960s. In 1964, at KDF's request, the legislature designated the first Friday of April as Arbor Day in Kentucky.

1970

Fire Towers Give Way to Aerial Detection—Fire towers that were traditionally used were retired from service, and the KDF began using aerial detection to spot fires. This method has proven effective in locating and suppressing wildfires.



↑ 1935

Putney Ranger Station Built in Harlan County—The CCC built the first ranger station in Kentucky that housed the offices of the Division of Forestry. In the early years, forest rangers and their families lived in the 12-room cabin.



1948

General Assembly Enacts Laws for Forest Management—These laws serve as the foundation for the Kentucky Forest Stewardship program that provides technical assistance to public and private landowners for the purpose of sustaining forest resources.

↑ 1964

First Governor's Conference on Forestry—The conference addressed concerns with wildfire and forest management and continued as an annual event until evolving into the Governor's Conference on the Environment in 1976.



1936

Reorganization Act—Enacted by the Kentucky General Assembly, the act largely abolished boards and commissions. As a result, the Board of Forestry became the Division of Forestry reorganized under the Department of Conservation (renamed the Department of Natural Resources in 1964).

1952

Wildfires Burn 728,000 Acres—Kentucky experienced its worst fire season in recorded history.

1965

Three KDF Firefighters Killed—March 1965 marked the first fatalities caused by forest fires in the history of the division as three firefighters—James (Buck) Shepherd, Kenneth McKnight and William Brock—lost their lives fighting a wildfire in Harlan County.

↑ 1980

Urban and Community Forestry Program—A shift in the state's population from rural to urban areas created the need to practice urban forestry. KDF established the program to provide technical assistance and funding to address the importance of urban trees for their social, environmental and economic benefits.

Continued to Page 15

Visit to Republic of Georgia a “utilitarian” adventure

Water flows over language barrier

By Allison Fleck
Division of Water

As coordinator of Kentucky’s drinking water program, Julie Roney spent 10 days in the Republic of Georgia providing expertise on Kentucky’s drinking water program, learning about local water infrastructure and finding common ground with her Georgian counterparts.

Roney traveled to the former Soviet bloc country with four officials from the Kentucky Public Service Commission (PSC) as part of a federally funded exchange program with the goal of improving regulatory practices and fostering long-term sustainable relationships between regulatory entities.

Since emerging from the collapsing Soviet Union as an independent state in 1991, Georgia has been working to build its economy, achieve political stability and improve its infrastructure. Roney said she learned that while Georgia has abundant water resources, the country’s treatment and distribution of drinking water are in need of improvement. Pollution controls also fall behind those in Kentucky.

Georgia’s water supplies come from glacier melt, water reservoirs, swamps and groundwater, but many of these sources are polluted by point and nonpoint sources, including municipal wastes from cities and towns, industry, hospitals, agriculture and runoff from cities and landfills.

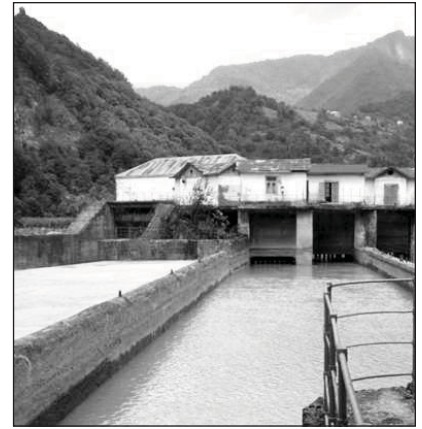
“It’s not unlike the issues we face here in Kentucky, but their environmental legislation, permitting and public awareness lag behind ours,” said Roney. “After all, they have a relatively young regulatory commission in a small country. Georgia is roughly the size of South Carolina and has a population of about 4.5 million people.”

As this trip exemplified, the Georgian government is looking to the West for help and advice in improving their drinking water and wastewater systems. Roney’s presentation focused on Kentucky’s engineering review process, finished water quality standards, treatment processes and water loss.

“I was impressed with how much they wanted to learn from us,” said Roney. “We received pages and pages of questions before our departure.”

Roney said she had to adjust to the use of interpreters during the meetings.

“We all wore headphones so we could hear the interpreters, who were amazing in their fluency and



TOP LEFT: *This building houses a Soviet-era hydro-electric plant built in 1937 that still provides power to most of the residents of southwest Georgia.*

TOP RIGHT: *This aqueduct carried water from the mountains to the hydro-electric plant built in 1937.*

ABOVE: *Julie Roney (fourth from left) and officials with the Kentucky Public Service Commission listen to interpreters during presentations made by her Georgian hosts.* Photos courtesy of the Public Service Commission

knowledge of technical vocabulary,” she said.

The interpreters also accompanied them on field trips to utilities and historic and cultural sites.

“We visited a hydro-electric power plant that was built by the Soviets in 1937 and was still supplying power to southwest Georgia,” said Roney. “We also toured a drinking water storage and pump station as well as a groundwater treatment plant. While the power plant was old, the other sites were brand new and all were noticeably well secured.”

A visit to the ruins of the 1,800-year-old Roman fortress Gonio also made an impression on Roney.

“Of course I was most fascinated by the terra cotta water pipes, the bath house and the latrines,” she said. “It was amazing to touch these stones and mortar and contemplate how long they had been there.”

Roney and PSC officials stayed in the city of Batumi on the Black Sea with views of majestic mountains in the distance. Modern streets with hotels and shopping co-exist with apartments where lines of wash hang from balconies to dry. Socially, the Republic of Georgia is still very much a “man’s world.”

However, Roney felt that her professional presentation was well received.

“They listened intently and were eager to learn how to apply our techniques to their situations,” she said. “I’m looking forward to continuing the conversation when next my new Georgian friends and colleagues visit Kentucky.”

Student “green teams” work to clear the air

Continued from Page 6



To make it easier to bike to school, students at Portland Elementary applied for and received a grant for a bicycle rack. Photo by Brenda Stokes, JCPS

lane at the end of the day. Many of the cars had their engines idling.

In their report, the students wrote, “This air is unhealthy for students to breathe as they enter and exit school. Too many students live close by and ride to school in a car. Would they ride a bike if there was a bike rack in a safe place to put their bikes during school?”

After conducting research and determining that a bike rack would be used by students, the green team applied for and received a KGHS grant to purchase their bike rack.

On the day of the Bike to School event, 20 students and 6 teachers rode bikes to school. In the months that followed, Portland Elementary saw an average of 30 students riding their bikes to school per week on fair weather days.

According to Science Teacher Brenda Stokes, “Bike to School was a big success. While working through this project, students became more aware of the effect cars and other vehicles have on clean air,” she said. “Most importantly, they found that even elementary school students can make a difference, and their voices will be heard and taken seriously. They have been empowered.”

Reducing Unnecessary Idling

On a sunny day in November, students from Rosa Parks Elementary walked up and down the carpool lane, clipboards in hand. “We’re collecting baseline data,” said fifth-grader Gaby Chacon. “We want to know how many cars in the carpool lane

are sitting there with their engines running.”

Located in Fayette County, Rosa Parks averages 80 vehicles a day in the carpool lane. It’s not unusual for many drivers to wait with engines idling until students are dismissed. Some cars begin lining up outside the school as much as an hour before school lets out. Student observations confirmed that an average of 25 percent of cars waiting in line had engines idling.

Armed with data and with help from teacher team leaders Katy Hollinger and Suzanna Weisenfeld, students proposed a voluntary idle-reduction plan at Rosa Parks. The following week the students were back in the carpool lane—this time, to raise awareness.

“Turning your engine off saves you gas and money, and it saves the air around our school,” said 10-year-old Mollie Hurst. As she and her fellow team members walked along the carpool lane, they handed out key chains to drivers with the message “Turn the Key, Be Idle Free!” The students also created posters and a public service announcement for their school radio station to help educate about the campaign.

Division for Air Quality (DAQ) Director John Lyons is a strong supporter of environmental education, especially when it comes to air quality. DAQ partnered with Fayette County Public Schools to provide the key chains and resources for the project at Rosa Parks.

“More than half of all air pollution

in the U.S. comes from transportation,” said Lyons. “If more people voluntarily reduced engine idling, it could have a big impact for cleaner air.”

In recent years, several Kentucky schools have begun idle-reduction campaigns. The Kentucky Department of Education already has a no-idling policy in place for school buses. At some schools, it’s an issue of indoor air quality as well; exhaust fumes are easily pulled into school buildings through doors and air vents located near the carpool lane.

For the students at Rosa Parks, raising awareness is only the first step. The real proof is in measurable results. Over the course of the school year, students plan to assess the campaign’s effectiveness by gathering more data. With colder weather on the way, teacher Katy Hollinger admits idle reduction might be a hard sell.

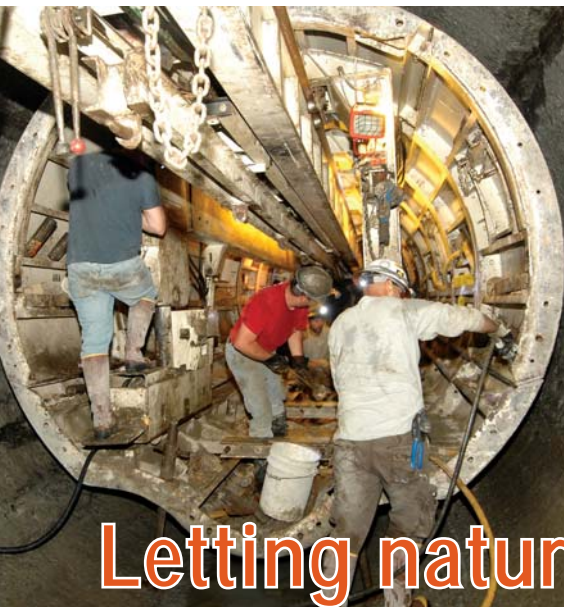
“We’re considering running an additional awareness campaign in the spring when weather warms up, to reinforce the message,” said Hollinger. “The team is aiming for a 15 percent reduction in idling by the end of the campaign.”

Education staff from the DAQ is available to assist any school or business interested in promoting clean air initiatives.

“When students make the energy/clean air connection, they realize that individual actions can really add up—for better or worse,” said Lyons. “It can be very empowering.”

Interested in Air Quality Education and Outreach?

The Kentucky DAQ offers teacher training, classroom and camp programs, firefighter education and other educational programming for community groups, forums and festivals. Learn more at 800-928-0047 or email roberta.burnes@ky.gov.



Letting nature take its course

Riverbank filtration system cleans water the old-fashioned way

By Allison Fleck
Division of Water

One year after completing its award-winning riverbank filtration project, Louisville Water Co. is producing up to 60 million gallons per day of safe, high-quality drinking water from the B.E. Payne Treatment Plant located on the Ohio River.

“At a time when cities are looking for low-cost solutions to source water contamination problems, Louisville can show the world that riverbank filtration is a viable alternative to conventional water treatment technology,” said Greg Heitzman, president and CEO of Louisville Water.

And the world is taking note. In March, the American Society of Civil Engineers honored Louisville Water with its 2011 Outstanding Civil Engineering Achievement Award for “superior civil engineering skills and making a significant contribution to civil engineering progress and society.” Other finalists included the Dallas Cowboys Stadium, Incheon Bridge Project in the Republic of Korea, Taum Sauk Upper Reservoir project in Annapolis, Mo., and Dulles International Airport Main Terminal in Washington, D.C.

Water treatment officials and dignitaries are coming from near and far to learn more about Louisville Water’s riverbank filtration system.

Riverbank filtration (RBF) is a process for producing drinking water that

uses the natural filtration properties of soil, sand and gravel to remove dissolved and suspended contaminants from the source water—in this case groundwater from the Ohio River aquifer.

The concept of RBF dates to the 1870s in Germany, and it is now a common water production technology in Europe. Louisville Water officials began investigating riverbank filtration as far back as the 1940s, revisited the idea in the 1970s, then began developing plans in the 1990s.

In 1999 a demonstration well with horizontal screens and an above-ground structure to house the pumping equipment were constructed to draw 15 million gallons of water a day from the aquifer.

Based on the success of that well, Louisville Water moved forward to expand riverbank filtration with a \$44 million project that began in March 2007 and was completed in December 2010. The expanded project includes no above-ground structures, except for the centrally located pump station.

“What is unique about the Louisville Water riverbank filtration project is that it is the first in the world to combine a gravity tunnel with horizontal collector wells as a raw water source,” said Kay Ball, program manager and an engineer for Louisville Water Co.

“To collect the groundwater, our engineers designed and constructed a 1.5-

mile-long, 10-foot-wide tunnel in bedrock located 150 feet below the ground surface and parallel to the Ohio River,” Ball explained. “Four collector wells equipped with a series of pumps and piping convey water captured from an aquifer below the layers of sand and gravel beneath the river.”

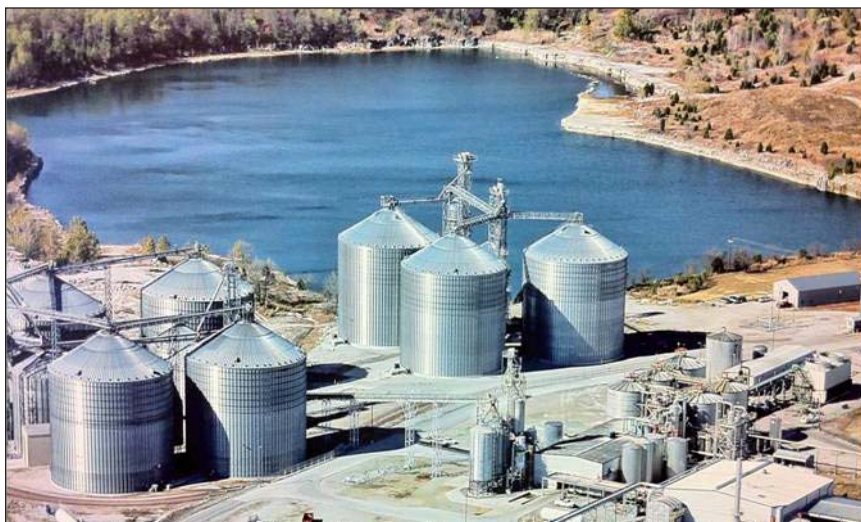
As water seeps through these soil layers, contaminants are naturally removed from the river water, including sediment, pathogens and organic chemicals. The collected water is then conveyed by gravity to a single extraction shaft located at the B.E. Payne plant, where it undergoes conventional treatment.

Because the water is cleaner when it arrives at the plant, it requires less treatment, thus saving on treatment materials, costs and equipment wear.

Louisville Water spent years researching the benefits of riverbank filtration. The sustainable, natural filtration process provides an additional barrier for pathogen

Continued on Page 15

TOP (left to right): Workers line the tunnel with concrete to create a 10-foot-diameter finished tunnel. A bird’s eye view of the work site shows the tunnel entrance. President and CEO Greg Heitzman, Chief Engineer Jim Brammell and Project Manager Kay Ball (all with Louisville Water Co.) stand inside the completed tunnel with Steve Holterman of Jacobs Engineering. Photos courtesy of Louisville Water Co.



Quarry Lake project yields energy savings

Ethanol-producing company grateful for ARRA funding

By Lona Brewer
Department for Energy
Development and Independence



Located near the banks of Quarry Lake in Hopkinsville, Ky., Commonwealth Agri-Energy LLC is one of 204 ethanol plants scattered across the U.S. It is owned by Hopkinsville Elevator Co. Cooperative and produces approximately 33 million gallons of ethanol from 33,000 bushels of corn per day and 12 million bushels per year.

Ethanol is alcohol derived from corn and is a renewable fuel source that has the potential to reduce the state's reliance on imported oil and reduce carbon monoxide emissions. The goal of Gov. Steve Beshear's strategic energy plan for Kentucky is to derive 12 percent of its motor fuel demand from biofuels by 2025, while continuing to produce safe, abundant and affordable food, feed and fiber.

Commonwealth Agri-Energy's Quarry Lake Water Project was conceived as a way to reduce energy consumption and reduce its costs per gallon of ethanol produced. The project included installation of a 5,000 gallons-per-minute pump, along with sufficient pipeline, to bring 50-degree water from an onsite quarry lake into the ethanol production facility. This low horsepower and less expensive lake-cooling process replaced the more expensive cooling tower process previously used to produce the ethanol. The water is pumped back into the lake where it is cooled and returns to its original temperature.

Energy savings have been significant over the past year, reducing the total number of kilowatt hours from about 2,300,000 to 2,100,000.

"The Quarry Lake Project was a valuable addition to our plant this long, hot summer," stated Mick Henderson, general manager of Commonwealth Agri-Energy. "We were able to lower our electricity costs in the highest priced season of the year."

The company applied for funding under the Multi-County Agricultural Energy Initiative to help finance its Quarry Lake Water Project. The initiative is a partnership between the Governor's Office of Agricultural Policy and the Kentucky Department for Energy Development and Independence that provides a 1-1 ratio match along with funds from the American Recovery and Reinvestment Act (ARRA) and state Agricultural Development Funds for agriculturally related renewable energy projects. The ARRA funds were part of the \$52 million State Energy Program grant received by Kentucky.

The project exceeded \$500,000, but outside funding including ARRA, state and local funds from Christian, Trigg and Todd counties totaled \$220,000. Annual electrical savings after project completion is calculated to be more than \$100,000 per year, mostly during summer months.

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TOP LEFT: Commonwealth Agri-Energy LLC is situated near the banks of Quarry Lake. **TOP RIGHT:** The old cooling tower was horsepower intensive and expensive to operate during the ethanol production process. **LEFT:** The pipeline and outfall where water is pumped from the lake to the plant. Photos courtesy of Commonwealth Agri-Energy LLC

Kentucky's Forestry Centennial *Continued from Page 10*

1990 ⇨

Forest Management Makes Strides—KDF's forest management program, which provides technical assistance to landowners, was upgraded to encompass the federal Forest Stewardship Program. In 1993, the National Woodland Owners Association honored KDF's Forest Stewardship Program as the finest in the U.S.



1998—Kentucky

Forest Conservation Act—Two years after the creation of the act, KDF became responsible for inspecting commercial timber harvesting operations. Regulations require a master logger be on site and in charge of all commercial timber harvests, and that best management practices are being used to reduce and prevent nonpoint source water pollution.

2009—Discovery of Emerald Ash Borer in Kentucky—Emerald Ash Borer (EAB) was initially discovered in 2002 in southeastern Michigan near

Detroit. Since its discovery, EAB has killed tens of millions of ash trees in the eastern United States, caused regulatory agencies to enforce quarantines, and cost municipalities, property owners, nursery operators and forest products industries tens of millions of dollars. Other insects and

diseases including the American Chestnut Blight, the Southern Pine Beetle outbreak, Dutch Elm Disease and Hemlock Woolly Adelgid have significantly impacted Kentucky's rural and urban forests.

2010—Kentucky's Forest Action Plan—KDF developed the *Kentucky Statewide Assessment of Forest Resources and Strategy* as a resource for partners involved in forestland management. The document serves to inform the public and policymakers about the current status and health of Kentucky's forest resources.

2011—KDF Suffers Loss of Firefighter and Earns Status as Fire Department—KDF firefighter Don Lam died from injuries sustained while fighting a wildfire in western Kentucky. The loss marked the fourth fatality in nearly 100 years of the division's history. Consequently, KDF officially became a Kentucky Fire Department with all rights and privileges as acknowledged by the Kentucky Firefighter's Association.

2012—KDF Today and Tomorrow—KDF celebrates a rich history in forestry. Historically, the division has enforced forest fire protection laws, provided fire suppression on private land, conducted fire prevention activities, maintained a tree seedling program and provided technical assistance to private landowners. In more recent years, the division has taken on community and urban forestry programs, timber harvesting inspections, forest health assessments and environmental education. Kentucky is fortunate to have a forest resource that remains productive and diverse and with proper management, our forests will continue to provide economic and environmental benefits for hundreds of years to come.

Letting nature take its course *Continued from Page 13*

removal and reduces risks associated with hazardous chemical spills, herbicides and pesticides, and other contaminants found in the Ohio River.

There are additional benefits of the new system as well.

"The riverbank filtration process creates a stable water temperature from 50 to 60 degrees, resulting in fewer main breaks in the distribution system," said Jim Brammell, chief engineer at Louisville Water. "Studies have shown that water mains fail at an increasing rate when the water temperature drops below 40 degrees Fahrenheit. Fewer main breaks save on repair costs and reduce disruption of water service to customers."

Furthermore, the water supply is sustainable since the aquifer is continually recharged by the river above it.

During construction and since the project went on line in December 2010, Louisville Water has worked to educate the community on the benefits to the drinking water supply.

"People are first intrigued by the tunneling aspect," said Ball. "Then, as they learn about the innovative solution to provide a cleaner source of water, they appreciate the value of the project."

Louisville Water documented the tunneling and well construction with videos and photos. Working with local educators,

the company created a science curriculum and video that is used in schools and by Kentucky Educational Television to help children understand the role of science in everyday life. A riverbank tunnel video for adults is available at www.louisvillewater.com.

Since December 2010, riverbank filtration has provided approximately 25 percent of Louisville Water's daily production of 125 million gallons. Currently, the company is evaluating advanced treatment options, including riverbank filtration, at its larger Crescent Hill Filtration Plant.

In operation since 1860, Louisville Water Co. provides water to about 850,000 people in Louisville Metro and parts of Bullitt, Nelson, Oldham, Shelby and Spencer counties. The first pump station, now a national historic landmark on Zorn Avenue, initially served only 512 customers. In the 1890s, the company pioneered research in water filtration and chlorination that virtually eliminated the threat of waterborne illnesses, such as typhoid and cholera, in the United States.

"Louisville Water has a rich history of pioneering advancements in water treatment," said Heitzman. "Riverbank filtration is another example of our commitment to science and innovation that improves the quality of our drinking water."

Local governments receive grants for brownfield cleanup

By Mary Jo Harrod
Division of Compliance Assistance

The U.S. Environmental Protection Agency (EPA) recently awarded five brownfield grants to Kentucky totaling \$1.3 million to fund the assessment and cleanup of properties with environmental problems. Brownfields are typically old factories, former gas stations, mine-scarred lands or dry cleaning establishments that are abandoned or underutilized because of real or perceived environmental contamination.

Each year, local communities are eligible to compete for these federal grants by developing and submitting competitive proposals. Since 2006, with help from the Kentucky Brownfield Redevelopment Program in the Division of Compliance Assistance, Kentucky has successfully brought in nearly \$6.5 million in federal funding for brownfield properties. Local governments that received the grants are:

- **City of Covington**—received a \$200,000 grant to clean up the former Stewart Iron Works site. Since the early 1900s, the facility has been used to produce metal works for gates, fencing and furnishings and is contaminated with paint and petroleum products.
- **Lexington-Fayette Urban County Government**—awarded a \$200,000 assessment grant to develop a communitywide hazardous substances site inventory and conduct 20 Phase I and 10 Phase II environmental site assessments.

Grant funds also will be used to develop five cleanup plans and conduct community outreach activities. Brownfield site assessments will identify potential risks and help ensure that the level of cleanup is appropriate for planned reuse. The county expects that assessments will catalyze redevelopment in the target area.

- **Louisville-Jefferson County Metro Government**—received two assessment grants of \$200,000 each—one for hazardous substances and one for petroleum to complete a communitywide brownfields inventory and conduct multiple Phase I and Phase II environmental site assessments.

Grant funds also will be used to develop multiple cleanup plans, conduct areawide planning and support community outreach activities. Petroleum grant funds will be used to conduct the same tasks at sites with potential petroleum contamination.

Also, Louisville received an additional award of \$500,000 that supplements an existing grant to set up a revolving loan account.

For more information, including specific grant contacts, additional grant information, brownfields news and events, publications and links, visit the EPA brownfields website at www.epa.gov/brownfields. To contact the Kentucky Brownfield Redevelopment Program, call 800-926-8111 or visit dca.ky.gov.

UPCOMING DCA WORKSHOPS

The Kentucky Division of Compliance Assistance (DCA) is developing its winter/spring educational workshops to help regulated and nonregulated entities with environmental issues. While exact times and dates are currently not available, check DCA's website periodically at dca.ky.gov for announcements about upcoming events. Events for the first half of 2012 will include:

- Air Permit Reporting Compliance Workshop
- Emergency Planning and Community Right-to-Know Act Webinar
- Chlorofluorocarbon Refrigerant Webinar
- Electronic Discharge Monitoring Report Workshop
- Introduction to Permitting Workshop
- Green and Clean Urban Gardening Conference
- 401/404 Water Permit Webinar
- Grant Writing for Community Development and Environmental Grants

Workshop and webinar days and times are listed in SNIPS and GreenDot, DCA's free e-newsletters. Subscribe to SNIPS at subscribe-snips@listserv.ky.gov to receive regulatory updates. To read the latest tips for sustainable living and working, subscribe to GreenDot at subscribe-greendot@listserv.ky.gov.

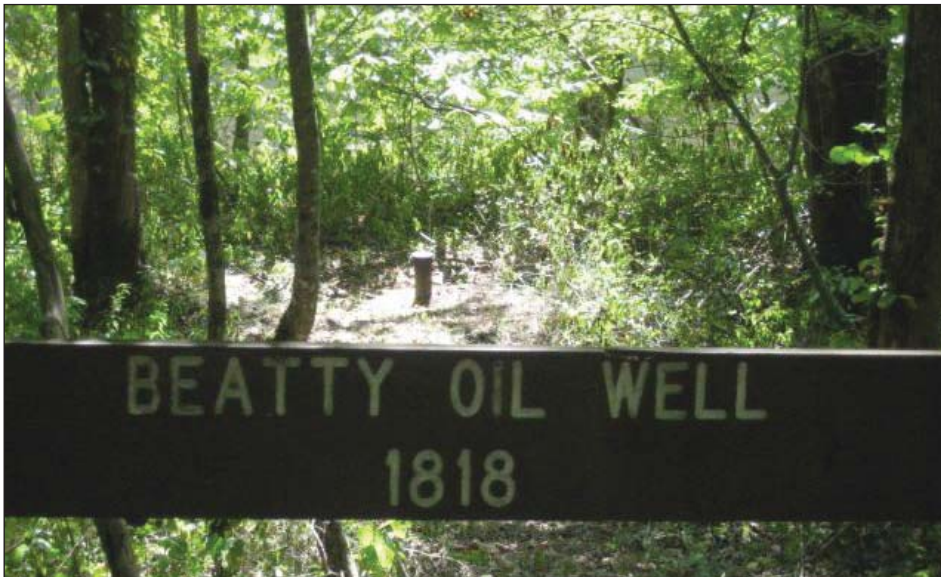
Quarry Lake project yields energy savings

Continued from Page 14

After seeing the satisfying results of this energy-efficiency project, Commonwealth Agri-Energy is considering future projects. Potential modifications for yield and efficiency improvements in fermentation, heat recovery and evaporation are being researched, as well as a new boiler and electric generator to reduce electricity requirements.

Investigation is also underway on the potential costs and returns to add product storage, and a plant expansion from 33 million to 48 million gallons per year is in the planning stage utilizing new technologies. Biomass to displace natural gas is being researched along with cellulosic processes that may work within the facility.

With assistance from ARRA funding through the Governor's Office of Agricultural Policy and the Kentucky Department for Energy Development and Independence, coupled with state and county funds, Commonwealth Agri-Energy was able to achieve its goal of lowering energy costs and production costs to produce ethanol in a highly competitive marketplace.



A chapter of Kentucky history is sealed

State's first oil well is plugged; property reclaimed

By Marvin Combs
Division of Oil and Gas



The Kentucky Division of Oil and Gas and the National Park Service, Big South Fork National River and Recreation Area in Oneida, Tenn., participate in a joint partnership to plug wells in the National Park in McCreary County, Ky.

On Oct. 14, Kentucky's first oil well, the Martin Beatty No. 1 well, was officially plugged and abandoned.

Plugging of the Beatty well included cement displacement through a 2-inch tube, which created a solid column of cement from total depth to the surface.

The National Park Service paid for all costs associated with the plugging and abandonment procedure.

History of the Beatty Oil Well

Nearly two centuries ago, Martin Beatty, an iron furnace operator from Abingdon, Va., drilled at the confluence of Oil Well Branch and the Big South Fork of the Cumberland River for natural salt brine due to an increased demand for salt as a food preservative during the early 19th century.

Drilling began in 1818 using a spring pole cable tool rig that incorporated rope and wooden rods to bore a hole. At a depth of 200 feet, Beatty's crew struck heavy black crude oil, which subsequently flowed into the Cumberland River. Initial reports estimate the well produced about 100 barrels of oil per day.

After failed attempts to ferry the oil downstream in wooden barrels, Beatty had the oil hauled over land by wagon and sold for the production of liniments and other medicinal purposes. Hauling expenses soon led to the abandonment of the oil venture, and Beatty's well was temporarily closed. This occurred about 41 years before Edwin Drake of Pennsylvania drilled the nation's first well specifically meant for oil production in 1859.

TOP: *The Beatty sign posted by the National Park Service. The wellhead is visible in the background.* **FAR LEFT:** *The well casing head with a welded cap prior to plugging.* **ABOVE LEFT:** *A workover rig cleaning out the well prior to plugging.* **LEFT:** *Reclaimed well site after abandonment.* Photos by Big South Fork National River and Recreation Area

Exhibit portrays plight of the Eastern hemlock at Georgetown College

Article and photographs by Lynn True
Division of Forestry

The Fallen

The “Fallen Hemlock” exhibit, recently on display at Georgetown College, provided a new venue for Save Kentucky’s Hemlocks—an advocacy group dedicated to educating the public about the plight of Eastern hemlock trees. The exhibit was created by Chicago-based, interdisciplinary artist Allison Warren. Warren, who frequently works on behalf of the environment, contacted Save Kentucky’s Hemlocks after becoming interested in the devastation of hemlock trees and Appalachian forests. As a collaborative effort between the artist, Save Kentucky’s Hemlocks, the Kentucky Division of Forestry (KDF) and Georgetown College, the exhibit was presented to the public in September and October at the Anne Wright Wilson Art Gallery on Georgetown’s campus.

Warren’s exhibit incorporated photography and sculpture to show the devastation and loss of the Eastern hemlock tree from infestation by the hemlock woolly adelgid (HWA). The tree used in the exhibit—a 40-foot Eastern hemlock from Bell County—was wrapped to signify injury and imminent death caused by HWA infestation. Mounds of hemlock shavings, bark and needles surrounded the tree to symbolize a living entity that is more than the sum of its parts. A final feature of the exhibit included a photo showing an open sky to signify the void left in the forest canopy from the fallen tree.

Warren’s art not only highlights the organic form in opposition of its destruction, it seeks to encourage viewers to connect with nature and understand the role of human stewardship of forests and other natural resources.

“I thought it was a wonderful approach to combine art and



Hemlock

science,” said Alice Mandt, KDF’s hemlock woolly adelgid coordinator. “Artists like Warren play a significant part in bringing environmental awareness to people who are not familiar with issues such as the loss of our hemlock trees.”

According to Mandt, the woolly adelgid has killed 80 percent or more of the hemlocks in states where it has been found. HWA, a native insect of Asia, was first reported in eastern Kentucky in Harlan County in 2006. Since then it has been found in 21 counties in Kentucky, including as far west as urban areas in Grayson and Oldham counties. The small, aphid-like insect varies from dark reddish-brown to purplish-black. As it matures, it produces a white, wool-like covering during the winter months to protect itself and eggs. This ‘wool’ found on the underside of the hemlock needles is a sure sign of infestation. Once infested, tree death can occur within two to seven years.

Although education and public awareness will go far in helping to preserve our hemlock trees, ultimately projects that focus on treating selected trees will ensure a future for hemlocks. KDF is working to fight HWA infestations on state-owned land in Bell and Harlan counties in the Daniel Boone National Forest and on private land. To help the cause, citizens can donate funds, as well as assist with various projects. For more information about HWA infestations and preserving our hemlocks, contact Alice Mandt at 502-564-4496.



Awards

Environmental Excellence Awards presented

By Mary Jo Harrod
Division of Compliance Assistance

The Kentucky Department for Environmental Protection honored recipients of its 2011 Environmental Excellence Awards during the Governor's Conference on Energy and the Environment in September. Recipients were recognized for their efforts to protect and improve Kentucky's environment. The awards were presented by Kentucky First Lady Jane Beshear.

- **KY EXCEL Champion Award: Ursuline Sisters of Mount Saint Joseph, Owensboro**—The Ursuline Sisters recycled 16,000 pounds of materials, including newspapers, cardboard, galvanized cans, office paper, aluminum cans, plastic and magazines in less than a year and have set a new recycling goal of 20,000 pounds. They have worked for more than 25 years to become Earth-friendly and educate others about sustainability.

- **Community Environmental Luminary Award: Smithfield-Team Middlesboro**—This year, Smithfield-Team Middlesboro participated in cleaning debris from Yellow Creek to provide a safe, clean place for kids to fish. The company also participates in World Water Monitoring Day; recycles office paper and aluminum cans, donating the proceeds to the city's Cops for Kids program; and supports several other local activities, such as Friends of the Shelter, multiple local food pantries and Relay for Life.

- **Resource Caretaker Award: Charles D. Williams, Munfordville**—Known as "the Tree Man," Williams has planted thousands of trees and hosted more than 4,000 forest tours for tree farmers, school children, forest landowners and others. He promotes sustainable forest practices, started the area's Arbor Day program and was responsible for Munfordville becoming a Tree City USA for its urban forestry efforts. Williams has been designated a Golden Tree Farmer and received the 2011 Good Steward Award from the Arbor Day Foundation for his lifelong efforts in practicing sustainability on private lands.

- **Environmental Pacesetter Award (Individual/Organization): Life Adventure Center of the Bluegrass, Versailles**—Located on a 575-acre farm, Life Adventure Center of the Bluegrass is a unique learning environment offering a variety of programs for children and adults. The center has Woodford County's first LEED (Leadership in Energy and Environmental Design)-certified building, a propertywide composting program and displays natural resource conservation efforts. A teaching garden allows participants to reconnect with the land and understand food origins. Other green practices include placing water heaters on timers, changing the majority of lighting to energy-efficient compact fluorescent bulbs and utilizing wood harvested during the construction of the building for the interior.

- **Environmental Pacesetter Award (Small Business): The Green Building, Louisville**—The Green Building achieved platinum LEED certification, becoming Louisville's first commercial building to hold the honor and is Kentucky's first Platinum Adaptive Reuse Project. Rehabilitation of the 115-year-old former dry goods store included resuscitating the structural masonry shell and infusing it with a modern core, including a 40-foot-high lobby, expansive natural lighting, ecofriendly materials and renewable energy systems, as well as extensive solar power, geothermal wells and recycled denim insulation.

- **Environmental Pacesetter Award (Medium to Large Business): International Paper, Henderson**—Sustainability and environmental stewardship are key to environmental improvements at this containerboard mill. The company uses a raw fiber supply of 100 percent recycled paper to produce containerboard for the corrugated box industry. In 2010, approximately 222,000 tons of discarded boxes and respective components were used instead of being sent to the landfill. Projects within the mill process have led to significant reductions in annual water usage and natural gas consumption. The mill adopted nearby South Heights Elementary School for opportunities of environmental education. A grant from the International Paper Foundation funded the construction of a kiosk at the Warbler Trail head at Audubon State Park.



First Lady Jane Beshear with Sister Amelia Stenger of Mount Saint Joseph.



First Lady Jane Beshear with Larry Griffon of International Paper.



First Lady Jane Beshear with Stephanie Brothers of the Green Building. Photos by Department for Environmental Protection

Student nominations sought for Eco-Art Contest

The Kentucky Department for Environmental Protection (DEP) is soliciting nominations for the 2011–12 Eco-Art Contest, formerly known as the Green Art Contest. 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 in the form of drawing/painting/print, mixed media, sculpture and photographs, with at least one winner being selected for each submitted art type within each category.

“The purpose of the contest is to encourage high school students to think about our environment and inspire them to reflect their thoughts on the environment in their artwork,” said R. Bruce Scott, DEP commissioner.

Contest nominations are being accepted until COB, March 14, 2012. 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 2011–12 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 in Frankfort.

For more information about the Eco-Art Contest and to access a nomination form, visit <http://dca.ky.gov/LGGS/Pages/ecoart.aspx> or call the Division of Compliance Assistance toll free at 800-926-8111. Photos of previous winning entries may be seen at <http://tiny.cc/t53ay>.

New and improved UST regulations *Continued from Page 3*

Challenges

Preventing releases and expediting the cleanup process is no small feat due to a variety of factors. Last year, there was more than one new confirmed UST system release per day. The cleanups associated with those new releases, and the difficult releases already on the books and still being cleaned up from years past, must meet stringent federal and state requirements. Many of the older releases are from UST facilities with difficult groundwater and geological conditions that do not support a speedy cleanup. With the use of taxpayer dollars also comes a great amount of documentation and attention to detail in administrating an environmentally responsible, fiscally responsible and transparent program.

Even with the challenges ahead, it is anticipated that the new regulations will be a positive step forward in protecting human health and the environment through further reduction of substandard and leaking USTs. A more comprehensive view of the new UST regulations, which became effective Oct. 6, 2011, can be found online in the UST Quarterly (Volume 3, Issue 3) at <http://waste.ky.gov/ust>.

Field trips and tours *Continued from Page 7*

products. Free tours of the recycling center are given the first Thursday and Saturday of January, April, July and October. Register in advance by contacting Esther Moberly at 859-367-4948 or at emoberly@lexingtonky.gov. Schools or large groups can be accommodated at other times, but arrangements must be made in advance. For more information, visit <http://www.lexingtonky.gov/index.aspx?recordid=2773&page=2698>.

- **The Green Building** in Metro Louisville is the city’s first commercial building to achieve platinum LEED certification and is Kentucky’s first Platinum Adaptive Reuse Project. The award-winning renovation of the former dry goods store is a prime example of the potential to be sustainable that exists in older structures (*See Awards on Page 19*). The Green Building hosts a large number of public events each year. For more information, visit <http://www.thegreenbuilding.net>.

From the Secretary’s Desk

Continued from the inside cover

has serious economic, environmental and national security implications. The speaker cited the dearth of new construction in the United States for electricity generation and energy infrastructure, and not just coal-fired generation but also nuclear, natural gas (pipeline capacity) and renewables. I’m not suggesting we emulate China because a host of societal and political differences account for the rapidity with which they implement many of these projects. More importantly, they must develop the equivalent of our current electricity infrastructure in slightly less than 15 years to accommodate a growing, more urbanized population. They are doing this with much more advanced, and cleaner, technologies than we are deploying, including more efficient and thus lower emitting coal-generating units.

So, in my mind, and in the minds of many others, what we are lacking is a commonsense discussion, at the federal level, on how to meet the nation’s growing energy needs; how to make sure we do not lose key manufacturing industries to other nations; how do we make sure our environmental policies actually lead to environmental and human health improvements; and how do we ensure an affordable, reliable supply of energy for both transportation and electricity. Will we effectively use our abundant natural resources (both fossil and renewable) in the United States to fulfill these goals? Or will we continue to pit technologies against one another; continue to pit states and regions against one another; and further erode our potential to grow our economy, create jobs, while further enhancing our ability to protect human health and the environment. *A de facto* energy policy, implemented through a string of poorly coordinated environmental rules and policies, is not the answer.



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Seedling nurseries: growing trees for healthy and productive forests



In Kentucky, fertile soils and seasonal temperatures make for a diverse plant community including both deciduous and coniferous species. Among the conifers, there are four species of pine that grow naturally in Kentucky—Eastern White Pine, Pitch Pine, Short-leaf Pine and Virginia Pine. Although none of their native ranges expands statewide, most of these pines grow in the eastern one-half of the state. Historically, the Eastern White Pine was referred to as “the monarch of the forest” by early settlers and is one of many species of trees that has made significant environmental and economic impacts in Kentucky.

The Eastern White Pine is an ideal candidate for landscape and windscreen applications. It is one of four species of pine available from the Division of Forestry’s seedling nurseries. Nearly 50 other native species are available now through early spring for planting projects during the dormant period. For an order form, visit <http://forestry.ky.gov/statenurseriesandtreeseedlings/Pages/default.aspx> or call 1-800-866-0555.

Just the Facts: Eastern White Pine (*Pinus strobus*)

- **Growth:** A mature Eastern White Pine has asymmetrical, horizontal branching, often with breakage from storm damage. Young pines are dense and typically cone-shaped. In Kentucky,

these trees can grow 50 to 60 feet tall and 20 to 40 feet wide. The leaves are spiral-shaped, flexible, five needles that grow 2 to 5 inches long. The fruit is an elongated cone, 6 to 8 inches long.

- **Sites:** Grows best in fertile, moist, slightly acidic soil in full sun, but can tolerate dry, rocky ridges to bogs.

- **Range:** Native to eastern North America, occurring from Newfoundland west to Minnesota and southeastern Manitoba, and south along the Appalachian Mountains to the northern edge of Georgia. In Kentucky, it is found in the Appalachian region.

- **Human Uses:** Widely used as Christmas trees and garland as well as being an important lumber source. It is used for flooring, paneling and is a popular choice for log cabin construction.

- **Wildlife Uses:** White pine seeds are favored by black bears, rabbits, squirrels and many birds, from chickadees to quail. The bark is eaten by mammals such as beavers, rabbits and mice. White pines provide nesting sites for many birds, including woodpeckers, common grackles, mourning doves and nuthatches. The evergreen foliage provides dense cover for habitat.

- **Tree Trivia:** Early settlers used the tree for military and commercial needs including sailing ship masts. Since the colonists were using up existing pines near the ocean that were large enough for masts, the Royal Navy appealed to Parliament, and in 1691 Great Britain imposed the first of the so-called “broad arrow” acts, so named because of the axe mark placed on the reserved trees by the king’s men. Growing resentment to the crown’s appropriation of the choicest White Pines helped precipitate the Revolutionary War, and the first flag of the revolutionary forces had an Eastern White Pine as its emblem.