



Land & Water

Kentucky Energy and Environment Cabinet

Volume 21 Number 4
Fall 2010

Land Air & Water

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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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Cabinet launches new Web site

The Energy and Environment Cabinet has redesigned and modernized its Web site to provide information quickly and efficiently. The site offers easily navigable drop-down options ranging from agency listings to cabinet online services to one simple page that explains the open records process for all cabinet agencies. The addition of "Quick Links" on many pages further directs users to the most requested items or program information, as well as new items of interest. The new site address is <http://eec.ky.gov/Pages/default.aspx>

With the launch of the new Web site, agency pages will maintain a consistent "look and feel" so that visitors can move throughout the entire site with ease. Each agency's site will provide down-down menus specific to their programs and resources, as well as employee directories and events.

The Energy and Environment Cabinet hopes you find the new layout intuitive and user friendly. E-mail Cynthia.Schafer@ky.gov if you have questions, concerns and comments.



Visit Land, Air & Water online at
<http://eec.ky.gov/Pages/LandAirWater.aspx>

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Printed on recycled paper with state and federal funds.

Land Air & Water

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Our Cover

This fall scene was taken at Brigadoon State Nature Preserves in Barren County. Photographed by Harold Kelley, Glasgow (read about Mr. Kelley on Page 9).



Printed by Post Printing
Lexington, Kentucky



Prescribed Fire **a critical management tool**

Article and photographs by KSNPC Nature Preserves
and Natural Areas Branch staff

OPPOSITE PAGE and RIGHT: *Prescribed fires at state nature preserves benefit fire-dependent flora and ecological communities by controlling the spread of shade-casting woody and exotic plant species.* KSNPC photos

Agencies within the Energy and Environment Cabinet (EEC) often find themselves at odds when dealing with issues related to the environment.

The Kentucky State Nature Preserves Commission (KSNPC) performs prescribed fires as an essential management tool within their preserve system. The Division for Air Quality, on the other hand, is concerned with the impact of prescribed fires on air quality and public health.

Together, these agencies follow strict guidelines that protect the Earth and benefit the populations of rare plants.

Kentucky State Nature Preserves Commission

Since 1987, staff of the KSNPC has been using various techniques to restore and manage their state nature preserves. Some methods require chainsaws, mowers and herbicide sprayers. By far, the most exciting management practice is prescribed fire.

A number of rare plants require some sort of disturbance regime (e.g. fire, grazing, flooding) to ensure strong and healthy populations. Every year, the commission conducts prescribed fires on state nature preserves that have fire-dependent flora and ecological communities such as limestone slope glades and post oak barrens.

These natural communities often provide habitat for rare, threatened and endangered species. The periodic reintroduction of fire into a disturbance-dependent community can help control the spread of shade-casting woody and exotic plant species and stimulate many glade and barrens species. Without fire management, some rare plant species such as Short's golden-rod (*Solidago shortii*), slender blazing star (*Liatris cylindracea*) and ear-leaf false foxglove (*Agalinis auriculata*) would be even rarer.

During March and April this year,



prescribed burns totaling more than 160 acres were conducted on seven state nature preserves.

"Prescribed fire is a key tool for restoring habitats that evolved with fire as a natural occurrence. However, reintroducing it in our heavily populated landscape requires great care and expertise," said Don Dott, director of the KSNPC.

Safety is of paramount importance on prescribed burns. Each burn is conducted by trained personnel of the commission's Nature Preserves and Natural Areas Branch according to a prescription developed by the preserve manager and approved by the branch manager. The prescription includes ecological objectives for the burn and a set of strict parameters for air temperature, wind speed and direction, fuel moisture and relative humidity. If on-site conditions do not meet these parameters, the burn will be rescheduled.

The area to be burned is called a unit. Prior to the burn date, the unit is carefully prepared by clearing flammable material from its perimeter, creating a firebreak. Specialized equipment such as drip torches, a skid unit fire engine, flame-resistant Nomex coveralls and other safety gear is used by the crew on the fire line. Fires set along the firebreak are closely monitored by the burn crew.

Staffing and weather conditions dictate the number of burns that can be accomplished during the burn season. For maximum impact, the prescribed fire

Kentucky Division for Air Quality

By Roberta Burnes

Where there's fire, there's smoke. Prescribed burning is a combustion process and, like all such processes, it releases particulate matter, nitrogen oxides and a host of other pollutants including hydrocarbons and mercury. These pollutants, in turn, may contribute to the formation of ground-level ozone or smog. Smoke from grassland burning may also temporarily obscure visibility—a problem if the burn is located near a road.

Under Kentucky's open burning regulation, prescribed burning as an ecological land management tool is permitted. The only exceptions are when a local ordinance prohibits the practice or during a fire emergency declared by the Division of Forestry. Under certain conditions, it's possible that a prescribed burn could trigger a temporary spike in monitored pollutants such as particulate matter. While it's rare for a prescribed burn to cause a violation of the National Ambient Air Quality Standards (NAAQS), there have been occasions when a combination of weather and multiple regional burns have briefly pushed monitored pollution levels very close to these limits.

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First Lady Jane Beshear is greeted by students from Richardsville Elementary School at the Net-Zero Energy Schools Grant announcement in Bowling Green. Photo by Department for Energy Development and Independence

Net-zero energy schools

By Brooke Smith
Department for Energy Development
and Independence

In May, First Lady Jane Beshear announced a \$1.4 million grant awarded to Warren County Public Schools for the purchase of solar photovoltaic panels that puts Richardsville Elementary School one step closer to achieving an energy-neutral facility—the first in the nation.

At a simultaneous press conference in Kenton County, Energy and Environment Cabinet Secretary Len Peters announced a \$2 million grant to Kenton County Public Schools for the purchase of solar panels for Turkey Foot Middle School. Both grants are designed to help the schools achieve net-zero energy usage over the course of a year. The grants are funded by American Recovery and Reinvestment Act (ARRA) monies from the U.S. Department of Energy and distributed through the Kentucky Department for Energy Development and Independence.

“Sustainable schools like Richardsville Elementary not only have a positive green impact by protecting the environment and helping with national energy

security but also teach children how to live their lives as responsible environmental stewards,” said First Lady Jane Beshear. “This is a message we cannot emphasize enough.”

Following years of experience with energy-efficient schools, architects and engineers designed the schools to consume a minimal amount of energy. Their high-efficiency design helps offset the schools’ energy demands by energy produced with solar panels. In Warren County, the clean energy the school is able to feed back into the grid will be sold to the Tennessee Valley Authority and essentially result in an energy-neutral facility.

Energy savings through ENERGY STAR®

Achieving net-zero energy status is a tremendous step for Kentucky schools, but districts can further reduce their carbon footprint by pushing for more sustainable, energy-efficient buildings. Schools that earn the ENERGY STAR® label use less energy, cost less to operate, lighten the load on the environment and improve comfort and indoor air quality for

students, teachers and visitors. A few years ago, the push to create more energy-efficient, sustainable public schools resulted in 12 earning ENERGY STAR® status. To date, 63 Kentucky public schools have earned the ENERGY STAR®—an amazing accomplishment.

Crestwood Elementary School in Oldham County is the first school in Kentucky to receive a maximum score of 100 from the ENERGY STAR® rating system. Locust Grove Elementary, also in Oldham County, earned a score of 99.

“We constructed Crestwood Elementary and Locust Grove Elementary to be leading schools according to ENERGY STAR® standards,” said Jim Ewalt, director of Facilities Management for Oldham County Schools. “We are extremely proud of our efforts and continued commitment to energy efficiency in Oldham County.”

The building designs included geothermal water source heat pumps, heat recovery systems used for outside air ventilation, variable flow water pumping systems and web-based digital temperature controls systems.

The district implemented other energy-savings techniques by controlling every district building remotely from a central office, saving energy by ensuring rooms are cooled or heated only when in use. The system communicates with the buildings and controls the mechanical systems when buildings are in use for summer or after-school activities that deviate from the normal school schedule. Controlling the

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**For
more
information**

Kentucky Energy Efficiency Program for Schools

<https://louisville.edu/kppc/keeps>

Kentucky Green and Healthy Schools

www.greenschools.ky.gov

Kentucky School Energy Managers Project

<http://www.ksba.org/energy-management>

National Energy Education Development Project

<http://www.need.org/states/kentucky/>

Kentucky—rich in oil producing history

17th-largest oil producing state in U.S.

By Evan Satterwhite
Department for Natural Resources

Kentucky's oil and gas industry began in the early 19th century near the Big Southfork National River and Recreation Area in McCreary County. By the end of the Civil War, the exploration era for oil and gas was underway, with the first commercial wells drilled between 1863 and 1865.

The production of oil peaked in 1959 when 27 million barrels were produced. In 1960, during the Kentucky legislative session, the Division of Oil and Gas was created to foster conservation of all mineral resources, encourage exploration of those resources, protect the rights of land and mineral owners, prohibit waste and unnecessary surface loss and damage, and encourage maximum recovery of oil and gas from all deposits. The division subsequently developed a permitting process for oil and gas-related wells; plugging and abandonment procedures were implemented in 1961 and groundwater protection regulations were implemented for freshwater zones in 1978.

Last year, the Division of Oil and Gas conducted more than 1,300 inspections on oil and gas wells to ensure mineral owners/operators work in an environmentally sound manner. The division also issued 1,367 permits primarily for new wells, approved 1,208 gathering lines and contracted the plugging of 130 abandoned wells.

The division maintains a well history database for each well in Kentucky. Currently, the database houses information on 136,286 wells and shares that information with the Kentucky Geological Survey to assist in the compilation of data, such as name of the operator, well location, well completion and other pertinent dates.

History of Oil and Gas

Oil and natural gas occurs throughout much of western, south central and eastern Kentucky. The largest natural gas fields



Many oil and gas wells in western Kentucky sit in the middle of thousands of acres of row crops like corn or soybeans. The landowners farm the land above, as mineral rights owners extract the natural resource from the reservoirs below. DNR photo

are located in eastern Kentucky buried in the Devonian Black Shale, a fine-grained sedimentary rock laid down during the Devonian geologic period 400 million years ago. At the surface, early settlers found many oil seeps, such as Burning Springs, Oil Springs and Oil Valley. In the subsurface, oil and gas were found where porosity, permeability, traps and hydrocarbon sources combine to form reservoirs.

Oil and gas are produced in Kentucky from more than 1,500 pools from rocks of Cambrian to Pennsylvanian age. Most oil is produced from Mississippian limestone and sandstone in eastern and western Kentucky or from Ordovician limestone and dolomites in southern Kentucky.

Oil and Gas Today

Although production varies with the ups and downs of the energy market, Kentuckians have benefited from the extraction of these natural resources. Today, the state's total production is 9.85 quadrillion British thermal units (Btu), 765 million barrels of oil and 5.4 trillion cubic feet of gas. However, even with this level of production, oil and natural gas deposits in the Appalachian Range remain

largely untapped. Consequently, all of Kentucky's counties have been tested to varying depths to determine the location of oil and gas reservoirs.

Kentucky has an estimated 18,000 producing oil wells and 13,000 producing gas wells. The majority of the wells produce 10 barrels of oil or 60,000 cubic feet of gas daily. Annually, Kentucky produces about 12 percent of the 921 trillion Btu of oil and natural gas it consumes. Despite this small output, oil and gas wells make a significant contribution to the nation's energy supply—and they are the lifeblood of thousands of small, independent oil and gas companies.

What lies ahead?

Other nations largely control the price of oil and gas commodities, and the expense of finding and producing this resource in Kentucky continues to increase. Consequently, Kentucky's oil and gas producers may face a shrinking profit margin in a market where they cannot rely on a stable price. Many marginal wells are abandoned causing a known energy resource to become unavailable for use.

Protecting our fresh water streams and underground drinking water sources is of utmost importance. Wells not in production after a specified period are required to be properly plugged and abandoned. However, many wells in Kentucky are known to be improperly plugged or illegally abandoned. The Division of Oil and Gas works to identify and plug these wells, but the availability of companies to do this type of work is restrictive.

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Rainwater harvest project makes ‘cents’

Project educates public while improving the environment

By Alison Simpson
Division of Water

A \$1.2 million rainwater harvest project in northern Kentucky will have economic, environmental and education benefits for the area it serves.

As far back as 2007, city planners in Covington began discussing the idea of harvesting rainwater from nearby Prisoner’s Lake into an irrigation pond in Devou Park, where the city golf course is located. The plan would save money on the purchase of water, treatment chemicals and the energy to pump it. But the benefits won’t stop there.

By reducing outflow from Prisoner’s Lake into Willow Run—the largest combined sewer system in northern Kentucky—the project is expected to alleviate the problem of combined sewer overflows (CSOs). Northern Kentucky Sanitation District No. 1 (SD1) is under a consent decree with the U.S. Environmental Protection Agency because of outflow problems, and the project would reduce rainwater flow—a major contributor to CSOs.

When city planners learned about the availability of funds through the American Recovery and Reinvestment

Act (ARRA), they knew their project would be a good candidate.

“We always wanted to harvest rainwater, but it was the green component of the ARRA funding that really piqued our interest,” said Tom Logan, director of public improvements for the city of Covington. “When the funds became available, we realized it could really happen.”

Logan and consulting engineer Jim Shumate of CDS Associates Inc. oversaw the project. Construction began in late October 2009 and is now nearly complete.

The plans called for construction of a pump station and force main to transfer water from the lake into the irrigation pond at the park. The pump is controlled by the water level of the lake and the pond when operating in summer. The project also included improvements to the embankment of the pond to prevent leaks.

“We had worked with SD1 before on projects, but this was our first project navigating and leading the charge,” Logan said. “We are a municipality that typically doesn’t do state revolving funds. The ARRA funds added another layer, and at times we struggled to meet

their deadlines.”

Despite the hurdles, project deadlines were met that required the contract to be in place and all conditions of the loan agreement fulfilled by Feb. 17, 2010. ARRA funding also required certifications that all equipment be manufactured in the United States and that Davis-Bacon wage rates be applied to all workers.

Logan said the community response to the project has been positive. Residents are pleased with the economic savings and the potential to protect the environment, not to mention ‘a magnificent pond on the golf course.’

The project also provides educational opportunities.

“We have used it to educate the community about the fact that it’s a ‘green’ project, that we are harvesting water and that it improves the CSOs,” Logan explained.

Logan said the project has set the bar for more green projects in Covington, which could lead to more opportunities for innovation and education about the benefits of green infrastructure.

Crews work on the irrigation pond at Devou Park Golf Course. Photo by DOW



LEFT: *The People's Garden located behind the West Liberty USDA Service Center provided fresh produce this summer to local food banks and a senior citizens' hall.*

BELOW: *Senior citizens from the Floyd County Senior Citizens' Hall look at the fresh vegetables delivered to their facility.* Photos provided by Pam Williams

The People's Garden

By Pam Williams and Johnna McHugh, Division of Conservation, and Lacy May, Natural Resources Conservation Service

Food banks in and around West Liberty, Ky., received fresh produce this summer courtesy of the West Liberty USDA Service Center. Employees of the various agencies at the center participated in the People's Garden Initiative and planted a vegetable garden that provided fresh fruits and vegetables to the local food banks and senior citizen's hall.

In February 2009, U.S. Department of Agriculture (USDA) Secretary Tom Vilsack announced the initiative and challenged all USDA employees, as well as non-USDA agencies and organizations across the nation to create people's gardens in their communities. Later in September, staff at the West Liberty USDA Service Center chose a location for their garden and determined that the community garden would serve two purposes—promote the goal of the initiative by nurturing, maintaining and protecting a healthy landscape and support President Obama's community service initiative "United We Stand." Finally, in March 2010, 15 full-time employees and one intern from the service center that includes the Farm Service Agency, Natural Resources Conservation Service, Morgan County Conservation District, Division of Conservation and Rural Development began making plans for the garden and broke soil for planting.

The 2,000 square-foot garden plot was located behind the service center office in a well-drained, sunny location. With help from the building landlord and volunteers, the soil was prepared and equipment and supplies were donated to help with the project. On April 22 in celebration of Earth Day, the first planting of cabbage and corn took place in the People's Garden. By the end of May, all plantings were completed including broccoli, cauliflower, radishes, carrots, onions, green beans, tomatoes, peppers, okra, squash, potatoes, sweet potatoes and cucumbers.

A key component of the project involved the distribution of harvested produce to organizations that provide assistance to those in need. Thirty-one counties are currently served by the



West Liberty USDA Service Center, and it was agreed that the garden would provide fresh produce to the food banks in those counties, as well as the local senior citizens hall.

"The combination of these two charitable organizations ensures that the fresh vegetables and fruits produced from the garden would be a nutritious supplement to people who might need a little extra help with their daily meals during the summer months and also might not otherwise have the opportunity to enjoy fresh produce," said Alden Collins, chairman of the Morgan County Conservation District.

On June 9, service center employees harvested their first crop including 35 bundles of onions, 17 bundles of radishes and several broccoli crowns that fed approximately 20 recipients at the senior citizen's hall. During the following weeks, the garden continued to produce in abundance and employees harvested more than 600 ears of corn, 175 pounds of green beans, 3 bushels of tomatoes and hundreds of zucchini, peppers, squash, cabbage and okra. Distribution of fresh produce made it to Magoffin, Johnson, Floyd and Wolfe counties. In July, a shipment was delivered to the Pikeville Senior Citizen's Hall to help those individuals who were affected by the devastating floods.

A second planting of cool-season vegetables took place in August. This, in conjunction with the initial planting, the partnerships involved and volunteer expertise will ensure a bountiful harvest of fresh produce throughout the growing season.

Prescribed Fire

Continued from Page 2

Kentucky Division for Air Quality (continued)

In 2008 on a single day in April, Mammoth Cave National Park conducted three controlled burns totaling more than 3,800 acres. Upper level winds carried smoke from the burns to Louisville, where air pollution monitors registered a significant spike in fine particle pollution levels. Although the levels never exceeded the NAAQS, the incident highlighted the importance of coordinating multiple burns to help minimize air quality impact.

"We can reduce the scope of prescribed fires to make the burn units smaller, re-burn the same units more frequently to reduce smoke impacts, and even adjust the temperatures of the burns," said Bobby Carson, air resources management specialist for Mammoth Cave National Park. "With lower ozone standards on the horizon we will have to take a closer look at all of our methods."

Jim Lempke, curator of Native Plants and Natural Ecosystems at The Arboretum, performs annual burns in small prairie plots at the 100-acre facility located on the University of Kentucky campus in Lexington. Lempke follows a strict protocol to maximize safety and minimize impact on air quality.

"By law, we have to get a burn permit from the Lexington-Fayette County Fire Marshal and the University of Kentucky Fire Marshal," Lempke says. The process requires writing a burn plan, which includes details on the purpose, strategies, staffing, tools, weather, fuel and fire behavior parameters, identification of fire and smoke sensitive areas and hazards, site preparation and other details. Since The Arboretum is located in an urban setting near roads and a residential area, Lempke and his staff are particularly conscious about the impact to local air quality.

Lempke prefers burning in late winter because ideal weather conditions – low wind and low humidity – are more likely

to occur then. Burning in late winter is good for another reason—smoke from the burn is less likely to contribute to ozone pollution or smog.

"I look for days when we haven't had rain, snow or ice for at least three to four days to minimize smoke. We are careful to burn when there is good atmospheric mixing so the smoke goes straight up and dissipates; we usually do a small test fire first to make sure we're okay," Lempke says.

While the ecological benefits of controlled burns outweigh potential risks, entities that practice controlled burns can minimize air quality problems and thus public health impacts by following strict guidelines for burning. They can also help minimize the risk of a regional air pollution episode by communicating with state and local agencies along with other entities that may practice controlled burns, to try to minimize multiple burns that could add up to a potential air quality violation.

Kentucky State Nature Preserves Commission

(continued)

season is timed to coincide with leaf break of targeted trees and shrubs. Fall burn season is scheduled following hard frosts that help to dry out the vegetation and improve its flammability.

Recent studies have shown that populations of insects dependant on remnant grassland habitat continue to occur in units burned multiple times. Research conducted at those sites suggests that the populations respond well to a prescribed fire regimen with three-year intervals between burns. Populations of rare plants have benefited from fire management as well. Short's goldenrod, a federally endangered plant growing in Blue Licks State Park Nature Preserve has increased due to more sunlight and open space resulting from repeated burning. At Crooked Creek Barrens State Nature Preserve, numbers of the state endangered slender blazing star and ear-leaf false foxglove have risen as well.

Challenge yourself to change the world

The Kentucky Department for Environmental Protection is challenging individuals and industries across the Commonwealth to reduce their waste and conserve water and energy, each by 10 percent over the next three years. That's only a little more than 3 percent each year.

Taking the "10-10-10 Challenge" is easy. Simply register yourself, your business or your organization and begin taking steps to reduce your environmental impact. If you are part of a pledge team, be sure to select your team name when you register so your pledge is credited to the team. If you do not have a team, no problem. Just sign up individually and take your first step to changing the future of Kentucky.

If you are a business or organization that would like to become actively involved and partner with the department in promoting the challenge, contact us at <http://dca.ky.gov/Pages/101010Challenge.aspx> or call 800-926-8111.



New rule would reduce interstate transport of air pollution

By Roberta Burnes
Division for Air Quality

In July 2010, the U.S. Environmental Protection Agency (EPA) proposed a new rule that would limit how much air pollution from power plants can drift across state borders. Referred to as the Transport Rule, it targets emissions from power plants and is designed to help eastern states meet existing air quality standards.

"This rule is designed to cut pollution that spreads hundreds of miles and has enormous negative impacts on millions of Americans," said EPA Administrator Lisa Jackson. "We're working to limit pollution at its source, rather than waiting for it to move across the country."

The Transport Rule impacts 31 states, including Kentucky and all of the Commonwealth's bordering states.

Emissions reductions are slated to begin in 2012—within one year of rule finalization. This is a very quick turnaround for a federal rule, and states are grappling with the implications of such rapid implementation. By 2014, the rule and other state and EPA actions would reduce power plant sulfur dioxide (SO₂)

emissions by 71 percent over 2005 levels. Power plant emissions of nitrogen oxides (NO_x) would drop by 52 percent. SO₂ and NO_x are of particular concern because they chemically react in the atmosphere to form fine particle pollution and ground-level ozone, which are linked to serious health concerns, including asthma and heart attacks. According to the EPA, almost 2 million work or school days are lost each year in the U.S. due to ozone and particle pollution-related symptoms.

Key elements of the proposal include:

- Twenty-eight states (including Kentucky) would be required to reduce both annual SO₂ and NO_x emissions. By reducing emissions from the upwind states, the proposal would help downwind states attain air quality standards, specifically the 24-hour PM_{2.5} standard established in 2006 and the 1997 annual PM 2.5 standard.

- Twenty-six states (including Kentucky) would be required to reduce NO_x emissions during the hot summer months of the ozone season because they contribute to downwind states'

ozone pollution. By reducing emissions from the upwind states, the proposal would help downwind states attain the 1997 ground-level ozone standard for air quality.

This proposed rule would replace EPA's 2005 Clean Air Interstate Rule (CAIR). A December 2008 court decision kept the requirements of CAIR in place temporarily but directed EPA to issue a new rule to implement the Clean Air Act requirements concerning the transport of air pollution across state boundaries. This action responds to the court's concerns.

Additional emission reductions from rules such as the Transport Rule will be needed for the nation to attain the existing ozone standard and any upcoming 2010 ozone standards. Each time the EPA changes national ambient air quality standards, it will evaluate whether new emission reductions will be required from upwind states.

For more information about the proposed Transport Rule, visit <http://www.epa.gov/airtransport/>. The rule may be viewed in its entirety at <http://www.gpo.gov/fdsys/pkg/FR-2010-08-02/pdf/2010-17007.pdf#page=1>.

Net-zero energy schools

Continued from Page 3



temperature remotely saves in fuel costs since maintenance personnel no longer drive to a building to adjust the thermostat.

Help for public school districts

Reducing energy costs to save money that can be reinvested in curriculum and education is a no-brainer; however, many districts have the same question: where to begin? Many school districts now include an energy manager that can help districts

create and implement an energy management plan. An energy manager helps schools generate energy savings that results in dollars put back into classroom instruction and reduces the school's carbon footprint.

A partnership between the Kentucky Department for Energy Development and Independence and the Kentucky School Boards Association (KSBA) initiated the School Energy Managers Project (SEMP), which recently hired 35 energy managers to serve 130 school districts. The managers will help the districts become more energy efficient through high-performance, sustainability programming. The project is funded through ARRA funds administered by KSBA with technical support from the Kentucky Energy Efficiency Program for Schools at the University of

Louisville's Kentucky Pollution Prevention Center.

"The SEMP training was designed to educate the energy managers on resources they can call upon in their work," said Ron Willhite, SEMP coordinator. "Expertise in facility energy practices exists through programs from the National Energy Education Development Project, the Kentucky Green and Healthy Schools initiative and the Kentucky Energy Efficiency Program for Schools.

"We want the impact of this program to go beyond school walls," said Willhite. "We want students and staff to take energy lessons home and help their families to make wise energy choices. We believe these cost savings can be realized across the state."

Newly hired energy managers. Photo by Chris Wooten, Kentucky Pollution Prevention Center



Help Wanted

No Experience Needed

Pay: \$0

Time spent on task: priceless

By Ricki Gardenhire

Office of Communications and Public Outreach

The Kentucky Energy and Environment Cabinet (EEC) offers many opportunities for Kentucky citizens to become environmental stewards. The Kentucky Division of Water and the Kentucky State Nature Preserves Commission are two agencies always on the search for volunteers.

Kentucky State Nature Preserves Commission (KSNPC)

Harold Kelley of Glasgow was looking for new places to practice his art of photography. What he found was 181 acres of potentially great photographs, a scenic place to get married and a volunteer position. Kelley, the preparedness coordinator for the Monroe County Health Department, is now the volunteer preserve monitor at the Brigadoon State Nature Preserve.

"I called to get permission to access the property to photograph. The western Kentucky preserves manager at the time asked if he could show me around. He did and after we got finished asked if I would like to be the preserve's monitor.

"I live about seven miles away and

it's not difficult to get over there and check on things," said Kelley. "I walk the trails and look for problems; remove limbs and pick up litter. I make sure rules are being obeyed. I take care of odds and ends and talk with visitors about the preserve when I'm out there.

"I let the commission know of any problems that I can't handle," he added. For example, two years ago he noticed that someone had tacked a deer feeder onto a tree. He called Lane Linnenkohl, the preserve's manager, and he and a Barren County Conservation Officer took it down.

"We have had problems with all-terrain vehicles on the trails. They came out and beefed up the fencing and added signs. That seems to have taken care of the problem.

"I'm honored to do it. More people need to get involved," said Kelley. "I'm sure there are other preserves that need help; and with the state's financial situation, if I can save a few bucks for the nature preserves agency, why not? I can't overemphasize how much I love this; I appreciate the state nature preserve for giving me the opportunity to do it."

BRIGADOON STATE NATURE PRESERVE

The preserve is located in Barren County adjacent to the Barren River Reservoir. Its rich woodlands contain an impressive array of spring wildflowers, including several species that are considered rare or uncommon. The preserve also provides habitat for many resident and migratory birds.

Directions - From Exit 43 on I-65, travel east on the Cumberland Parkway to its junction with US 31E in Glasgow. Follow US 31E south for 6.5 miles. Turn left onto Dover Church-Browning School Road and travel approximately 1.5 miles. Turn left onto Mutter Road. The parking area is approximately one-half mile on the left.

TOP: Hidden Stream at Brigadoon State Nature Preserves. **LEFT:** Spring beauty (*Claytonia virginica*). Photographs provided by Harold Kelley



LEFT: A mother and her children look for macro invertebrates in a stream. BELOW and LOWER LEFT: A trainer carefully searches for macro invertebrates in his net and container. The “critters” are very tiny and easy to miss. Photos by Division of Water



The KSNPC is looking for volunteers to help in the field and in the office. For those who would like to make an ongoing commitment, refer to the positions below and contact KSNPC at 502-573-2886.

- **Volunteer Naturalist**—Scans and organizes plant images in the Frankfort office. Additionally, assistance labeling plant collections is essential. Low-level familiarity with computer use is required. Locates and monitors rare plant species on public lands. Volunteers should have some plant identification skills and be able to work independently.

- **Data Management Assistant**—Involves reviewing and processing data in the Frankfort office. Would require at least a half-day per week.

- **Preserve Monitors**—Reliable individuals will visit their assigned preserve at least twice a month and fill out reports on the conditions of the preserve. Additional training will be provided. Positions are available at many of the preserves.

Division of Water—Kentucky Water Watch

The Kentucky Water Watch program was launched in April 1985 to increase citizen participation and education in an effort to protect the state’s waterways. The purpose was to not only teach citizens

about water quality but to enlist their help in monitoring the waterways and reporting their findings to the Division of Water (DOW). This monitoring data helps with stream assessments and allows the Water Quality Branch to know what areas are being impacted the most.

Kentucky Water Watch has more than 500 trained individuals that participate in the program and sample more than 800 locations across the state. Volunteers submit their findings via mail or online data entry.

“This program has been a huge success with the teachers in their environmental science classes,” said DOW’s JoAnn Palmer. “Teachers attend a Water Education for Teachers workshop where they receive credited hours for continuing education and then they can go back to their schools and perform water monitoring with their students.”

You can learn more about Kentucky’s Water Watch program at <http://water.ky.gov/ww/Pages/default.aspx>

Watershed Watch in Kentucky

The popularity of the division’s Water Watch program spurred the creation of another volunteer-driven program, Watershed Watch in Kentucky. The DOW launched its Watershed Watch program in 1997 in an effort to promote the new watershed management plan. A board of

representatives works together to oversee the activities and functions of eight nonprofit organizations that make up this amazing program.

There are eight watershed basins in Watershed Watch—Big Sandy, Four Rivers, Upper Green, Kentucky, Licking, Salt, Tradewater/Lower Green and Upper Cumberland. The program not only stretches across the state of Kentucky, but there are also volunteers in Tennessee, Virginia and West Virginia.

Dr. Michele Morek, an Ursuline Sister of Mount Saint Joseph and professor emeritus of environmental science and biology at Brescia University in Owensboro, has been a “water watcher” since 1987.

“I grew up in New Mexico where irrigation was the norm, and I’ve always had a reverence for water,” said Dr. Morek. “I thought this was a good community service that I could do. There is a lot going on in our local communities that answer to community need. Concerns about confined animal feeding operations, leaky septic tanks and power plants can all be linked with quality water.”

There are more than 3,000 volunteers and approximately 2,800 monitoring stations in the Watershed Watch program. For more information, visit <http://water.ky.gov/ww/Pages/default.aspx>.



Delegates from the Ukraine enjoy the beauty of Churchill Downs in Louisville during some leisure time away from the program.

Photo submitted

PROGRAM TEACHES UKRAINE VISITORS ABOUT WASTE MANAGEMENT ISSUES

By Duke York
Division of Waste Management

A delegation of 10 Ukrainian waste managers and environmentalists visited the Kentucky Division of Waste Management (DWM) earlier this year to get a first-hand look at how this country deals with waste issues. The delegates were from the Zaporizhia Oblast (province). Zaporizhzhya, the administrative center for the Oblast and a city about the size of Louisville, is a leading industrial center where the Ukraine's largest auto manufacturer is located.

The delegation came to Kentucky under a grant by U.S. Aid, an agency in the U.S. Department of State. The World Affairs Council of Kentucky, which hosted the delegates, asked the DWM to put together a program to educate the Ukrainians on U.S., state and local regulations and to show the range of options for creating effective and environmentally sound waste management systems that work with private industry and the public to eliminate environmental degradation. The delegates also expressed interest in learning about planning waste management projects, landfill operations, waste reduction, recycling, composting, household garbage gasification, and how to get local communities involved in waste issues.

The first three days of the 17-day visit included a roundtable discussion where the delegates received an overview of state and federal waste regulations from Division of Waste Management Director Tony Hatton. Two interpreters traveling with the group provided assistance in communications when needed, although no one found it difficult to interpret the visitors' enthusiasm for learning.

The days following included visits with local government officials and opportunities to tour landfills, composting operations, brownfield projects, manufacturers, a hazardous waste facility, and paper, waste tire and e-scrap recyclers from Winchester to Sturgis. These visits provided a first-hand look at operations that could soon become a reality in the delegates' home region. It also provided the Ukrainians with exposure to experts in the private sector and their role in the waste management process. Throughout the program, the delegates were required to work on action plans to develop projects they could accomplish within six months of their return.

The trip to Kentucky also included some leisure time, as well as cultural experiences for the Ukrainians. They visited Churchill Downs, the Louisville Zoo, the Frazier International History Museum, Mammoth Cave National Park,

the National Underground Railroad Freedom Center, the Newport Aquarium and enjoyed celebrations during the Kentucky Derby Festival. A hallmark of the international visitors program is for delegates to experience America through various cultural and community activities.

The DWM program was deemed a success by the delegates and U.S. Aid. According to evaluations completed following the visit, the Ukrainians praised the knowledge and professionalism of the DWM staff, while U.S. Aid said the program was as comprehensive and targeted as any they had recently reviewed.

Not only did the Ukrainians take home valuable information about waste management issues, but DWM staff also learned that people face the same environmental problems worldwide, such as a lack of resources and public awareness. Both are better for having shared this experience.

Kentucky—rich in oil producing history

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In July, Department for Natural Resources Deputy Commissioner Larry Arnett visited several pumping and plugging operations in western Kentucky to learn more about the Division of Oil and Gas program.

"Our visit to the oil fields was very informative," said Arnett. "The extensive oil and gas resources in our state are crucial to meeting increasing energy needs while providing employment to hundreds of Kentuckians. Our challenge is to ensure that both the industry and our agency work together to guarantee these valuable resources are developed in a safe and environmentally responsible manner."

Kentucky UST Program

Protecting our natural resources for 25 years

By Virginia Lewis
Division of Waste Management

First Steps

In 1984, Congress passed and the president signed a new law requiring the U.S. Environmental Protection Agency to protect the nation's land and water from leaking underground storage tanks (USTs). The following year, the Kentucky Underground Storage Tank Program was established.

During that timeframe, Bowling Green was under a health advisory due in part to leaking underground gasoline tanks. The tanks were suspect in a number of house explosions, and civil suits resulted in Lexington and Louisville after property owners were forced to evacuate their homes.

The state estimated that there were 14,750 to 16,000 USTs in Kentucky.

A Cooperative Effort

After instituting a new federally mandated notification system, it was learned that there were actually more than 30,000 USTs in Kentucky. Since then, 49,398

USTs have been registered, 37,780 have been permanently closed and 12,390 "No Further Action" letters have been issued.

Ensuring that federal and state requirements are met and contamination is cleaned up is no small feat. It requires the cooperation of UST owners, operators, contractors, neighbors, officials, other agencies, UST program staff and often assistance from the Petroleum Storage Tank Environmental Assurance Fund (PSTEAF). There are still many UST sites requiring work. Currently, 139 sites are undergoing closure, 1,460 are in site investigation and 377 are receiving corrective action.

Closing tanks and cleaning up contamination is only part of the UST program equation. The program ensures that individuals who manage the day-to-day operations for each UST system comply with federal and state regulations. After all, with good UST system management that includes proper leak detection, corrosion protection, and spill and overfill practices, the chance of having a leak is greatly reduced...but not

UST Program, there have been 14,515 confirmed leaks, 163 occurring since the beginning of this year.

The Journey Ahead

Many challenges remain along the road to success. State regulations are being updated to implement recent changes in federal regulations and to address other existing issues. Innovative ways are being considered to streamline and expedite site assessment and cleanup. Simplification of the reimbursement process and the elimination of "red tape" are top priorities, as well as defining new ways to boost compliance rates to help minimize future releases.

The program's ability to protect our natural resources is ensured through the passage of supportive legislation and proper funding. During the last session, legislation extended the PSTEAF deadlines, and the 2011-2012 budget appropriation for the PSTEAF to pay claims for reimbursement included appropriations of \$25 million through bond sale proceeds for each of the next two fiscal years. This establishes

reimbursement funding until June 30, 2012, and maintains the current level of funding from the previous budget.

"Over \$20 million was reimbursed during fiscal year 2010, which ended June 30

and represents the highest level of reimbursement since 2004," said Robert H. Daniell, manager of the Underground Storage Tank Branch. "This reflects the outstanding efforts of tank owners, operators, certified contractors and UST Program staff in carrying out permanent closures, site investigations and corrective actions."

As the Kentucky UST Program celebrates its 25th year, we want to thank everyone who has worked with us to take care of our homeland. The journey must continue; the destination lies ahead and we look forward to traveling with you toward a greener and cleaner Kentucky.

There are 11,623 active USTs at 3,846 sites in Kentucky.

eliminated. Even with proper management and the best equipment, there is still no leak-proof UST system. Tanks still leak—even new ones—and the piping with all of its joints, twists and turns leaks, too. Throughout the history of the Kentucky

Christina Baker, an environmental technologist for the Underground Storage Tank Branch, stands beside tanks during a site visit in Lexington. UST photo



Operating in the ‘green’

By Mary Jo Harrod
Division of Compliance Assistance

KY EXCEL, the state's voluntary environmental leadership program, includes members from all walks of life and range in size from large international businesses to governments to individuals. Each member is creative in ways to go green. For project ideas that you can do in your home or business, read what the following members are doing or contact KY EXCEL at envhelp@ky.gov or 800-926-8111.



Anchored on the banks of Elkhorn Creek in Franklin County, the **Jim Beam-Old Grand Dad** plant had been setting aside capital toward the purchase of new gasoline-powered vehicles for the Environmental Health and Safety/Security (EHS) Department, according to Corey Sugg, EHS specialist at the facility. The company, which is a partner member of KY EXCEL, is a facility where several types of alcohol spirits, such as Jim Beam, Sauza Tequila and Canadian Club, are processed, bottled and shipped to customers all over the world. In a break from the traditional way of operating the business, the facility decided to replace two gasoline-powered pickup trucks with three electric golf carts.

“By replacing the gasoline-powered vehicles with electric utility carts, we were able to reduce our carbon dioxide emissions by more than 32,000 pounds, based

on driving 12,000 miles annually per vehicle,” says Sugg. “Use of these electric carts has decreased our carbon footprint and the amount of gasoline that is used at our facility.”

Sugg reports that the facility has decreased its consumption of gasoline by 1,500 gallons. Since the electric carts require less maintenance, this has freed up time for the company mechanics to work on the larger trucks, which are key to the production process.

“At first, there were jokes about the electric golf carts, but people love to use them,” says Sugg. “We feel that this is a much more efficient and sustainable way to run our operation.”

The Jim Beam-Old Grand Dad facility is also registered to ISO 14001:2004, an internationally recognized standard for Environmental Management Systems; ISO 9001: 2008, an internationally recognized

quality management system; and OHSAS 18001:2007, an internationally recognized occupational health and safety system. Additionally, the plant is HACCP-certified, which is a food safety program. These registrations exhibit their commitment to not only the environment, but to employee and product safety and quality.

Having a management philosophy that evaluates tasks performed and investigates how these tasks could have an impact on the environment demonstrates a commitment to be an environmentally and safety-conscious facility. The company's partnership with KY EXCEL, combined with its ISO 14001 status, has assisted the facility to develop environmentally best practices and continuous improvement goals and objectives.



LEFT: The rain garden at the Governor's Mansion is planted with native species and directs water along prepared basins to prevent gullies and erosion. Photo by Mary Jo Harrod

ABOVE: One of three electric golf carts purchased by the Jim Beam—Old Grand Dad facility to reduce the consumption of gasoline and the company's carbon footprint. Photo provided by Jim Beam—Old Grand Dad

Kentucky Governor's Mansion

First Lady Jane Beshear and mansion Executive Director Ann Evans both are focused on going green, so joining KY EXCEL as an advocate member is a good fit.

The mansion already employed many green practices, such as recycling, adjusting thermostats, changing lights to CFLs and LEDs and buying only energy-efficient appliances. The governor and first lady enthusiastically support local agriculture by shopping at farmers' markets and supporting Kentucky agribusiness. The mansion grounds are also home to an herb

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CHIA revisions enhance the protection of watersheds

Water quality data required on all coal permit applications

By Richard J. Wahrer, Danita LaSage and Jeff Laird
Department for Natural Resources



The Kentucky Department for Natural Resources (DNR) is making a substantial revision to its Cumulative Hydrologic Impact Assessment (CHIA) process currently used for each proposed coal mining operation. CHIA is a required decision document that gauges the effects of a proposed mining operation on the hydrologic balance of a specified watershed.

The process was developed in the early 1980's to protect major watersheds within the Kentucky coal-fields. Previously, data used to develop the decision was collected from U.S. Geological Survey monitoring stations that were in close proximity to municipal water withdrawals. The decision document was based on existing water quality data for sulfates and total dissolved solids, the extent and rate of previous mining in the watershed and predictions of future water quality based on coal demand trends.

Changes in environmental water quality standards and increased scrutiny by state and federal agencies regarding coal mining effects on streams resulted in the DNR and other representatives addressing the vital components of CHIA.

One significant revision is a change in the scale at which impacts are viewed, from river



TOP: OSM interim employees (left to right, back row) Jay Cunningham, Louis Bates, Brian Murphy (left to right, front row) Amy Powers, Samantha Mitchell and Tiffany Ogunsanya.

ABOVE: Amy Powers performs conductivity analysis for CHIA data in eastern Kentucky. DNR photos

basins or sub-basins to watersheds. To evaluate watershed impacts, it is necessary to review data from past, present and anticipated coal mining permits. Each coal permit application submitted to the Division of Mine Permits contains baseline surface and ground water data. Consequently, water quality is routinely tested during mining and continually monitored through bond release. The past 35 years of data exists only on paper, but to conduct trend and modeling analyses, an electronic format is required.

Currently, gaps exist in the data because the statewide water quality monitoring system was not designed for watershed-scale CHIAs. Additional monitoring will need to take place through the creation of new trend (gauging) stations, which will identify appropriate models for implementation

and collect model data to help predict the effect of new coal mining operations on water quality in a small watershed, thus fulfilling the intent of the assessment.

The DNR is in the process of identification and ground verification of 237 trend stations in the eastern Kentucky coalfield and 37 trend stations in the western Kentucky coalfield. The parameters tested include standard regulatory monitoring requirements and others of concern that may be associated with mining operations, such as selenium, aluminum and magnesium. This monitoring network will measure the cumulative effects of coal mining in the state and provide accurate water quality data to state and federal agencies and coal industry stakeholders.

Support from the Division of Mine Permits' geographic

information system (GIS) and its associated databases is critical to the CHIA process. Customized GIS tools streamline the CHIA workflow and enhance the permit reviewer's ability to analyze water quality results in a quick and efficient manner. GIS-generated maps, graphs and tables comprise an average of 37 individual resource documents unique to each watershed. Once a watershed is selected, water quality results from state and federal databases are extracted from within the permit boundaries using GIS, mine histories, pending permit reports and benthic and pollution data.

The permit boundaries are mapped and displayed, along with their spatial relationships against an array of other map features that may or may not have potential impact on the

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Operating in the 'green'

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and tomato garden, as well as a beehive.

"The governor and I want the executive mansion to serve as a role model for other families and homes," said the first lady. "We learn best by example, and it's important for the mansion—truly the 'Peoples' House'—to represent good stewardship of our land and resources."

"We were already committed to green practices at the mansion, but it's always beneficial to see what other people are doing to preserve the environment," said Evans. "It's wonderful to have an organization like KY EXCEL for people who are trying to be green and want the fellowship of others who are doing the same thing."

For its project, landscapers at the mansion created a certified rain garden on the grounds, which serves as a quiet getaway as well as an environmental investment. The garden occupies part of a hillside and includes a former flower garden of a home once on the property.

Landscape Branch Manager Garth Vincent, along with Sandy Perkins and Tim Depenbrock, worked closely with the Kentucky State Nature Preserves Commission to remove honeysuckle and exotic invasive plants and replaced them with native species. The team also repaired a retaining wall as a joint project with the Dry Stone Conservancy.

During heavy rains, water used to gush down the hillside lawn toward neighboring homes. The rain garden uses small hills to slow the water flow and redirect it to the new plants.

"The rain garden is layered as water collects, so it rolls over to another basin," says Depenbrock. "This gives the water a chance to soak into the ground. Those little undulations in the hill help capture

and absorb the excess water, which prevents gullies and erosion."

Trees also help to anchor the ground during heavy rains. Some of the rain garden trees include hemlock, hackberry, elm, black gum, Douglas fir, weeping redbud and dogwood. Flowers are plentiful, too. Visitors will find hostas, wild ginger, day-lilies, columbine, grape hyacinths, lilacs, native astors, tulips, Dutchman's britches and mountain laurel, among others.

"Our mission statement is to be good stewards of the land," said Vincent. "We're passionate about protecting and promoting our state's natural beauty, and this project is a perfect fit for the Governor's Mansion."

Mountain Association for Community Economic Development (MACED)

"All of the staff at Mountain Association for Community Economic Development in Berea are involved in making our office building green and cutting waste," says Barbara Reed, MACED office manager and KY EXCEL contact at MACED, an advocate member.

For this year's KY EXCEL project, MACED chose to compost food scraps. Irene DeLuna, forestry program associate, suggested the project, which involves having composting bins in each of the two office kitchens. The 30 employees are invited to bring their coffee grounds, paper

New KY EXCEL members

For more information about KY EXCEL call 1-800-926-8111 or visit <http://dca.ky.gov/kyexcel/>.

Advocate

Kenviron Inc.—Frankfort
Environmental Restoration LLC—
Louisville Regional Office
Lancaster Cabinetry Inc.—
Hopkinsville
Buffalo Trace Green Council—
Maysville
MICAH Group Energy and
Environment—Lexington
YMCA of Greater Louisville—
Louisville

Partner

Smithfield Packaging—Grayson
Federal Corrections Institution—
Manchester
Gibbs Die Casting Corp.—Henderson
Heaven Hill Distilleries Inc.—
Bardstown
Catalent Pharma Solutions—
Winchester
Jim Beam Brands Co. Inc., plants No.
1 and No. 2—Clermont

Leader

Duro Designer Products—Walton
Duro Standard Products—Florence

Master

SRG Global—Morehead
Global Environmental Services—
Georgetown

Interior windows were added to allow for natural light in a windowless office, which allows hall lights to be turned off in some areas. Photo by

Mary Jo Harrod



products and waste from daily food items to the bins.

"At the end of the day, I use a digital scale to weigh the contents of each bin and then take it to my home composting bin outdoors," says DeLuna. "The daily average collected is three pounds."

Prior year projects included replacing magnetic light ballasts with electronic

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Change in command symbolizes a continuation of leadership

Kentucky Department for Environmental Protection employees recently attended two Change of Command ceremonies at the Armed Forces Reserve Center.

Lt. Col. Steven Basso assumed command of Blue Grass Chemical Activity (BGCA) on June 14 from Lt. Col. David Musgrave in a ceremony lead by U.S. Army Chemical Materials Agency Director Conrad Whyne.

Col. Joseph Tirone relinquished command of Blue Grass Army Depot (BGAD) on July 13 to Col. Brian Rogers in a ceremony lead by Brig. Gen. Larry Wyche, commanding general of the U.S. Army Joint Munitions Command.

The Change of Command ceremony is a tradition that honors the outgoing commander while acknowledging the transfer of responsibility and authority to the incoming commander. The organization colors are passed to symbolize the transfer and reinforce the continuity of leadership.

Located in Madison County, Ky., the BGAD provides logistic support to the military by receiving, storing, servicing and shipping an array of munitions as well as producing equipment components essential to enhancing the military's capability. The BGCA is a tenant facility of BGAD responsible for the safe storage and monitoring of the chemical munitions until their destruction at the Blue Grass Chemical Agent-Destruction Pilot Plant that is currently under construction.



Lt. Col. Steven Basso receives congratulations after the ceremony. BGAD photo

Workshop opportunities offered

The Division of Compliance Assistance (DCA) and Trinity Consultants will present a workshop on Nov. 10 and Dec. 15 (times to be announced) to offer guidance on annual compliance certifications and semiannual monitoring reports. Trinity Consultants is a member of KY EXCEL and will partner with DCA as part of its membership in Kentucky's environmental leadership program.

This training will feature short presentations on how to read permits and offer explanations of annual compliance certifications, semiannual monitoring reports and their purpose. Participants will be given time to fill out portions of their annual compliance certifications and semiannual monitoring reports.

Participants should bring a copy of their permit(s), a blank annual compliance certification form (paper or on a laptop), pencil and highlighter. An agenda can be viewed at <http://dca.ky.gov/Pages/Training.aspx>.

Please note: This training is specific to air quality compliance reports only and will not cover topics related to the new online Emissions Inventory System or annual emissions reporting. Registration is required.

Operating in the 'green'

Continued from Page 15

ones and switching to high-performance lighting.

"The upgrades reduced our carbon footprint by an estimated 12,522 pounds per year and saves MACED approximately \$460 per year," says Energy Specialist Josh Bills.

Christmas lights were also replaced with LED bulbs, resulting in a reduction of the holiday lighting bill by 90 percent.

A number of measures were taken in the renovation to make the office building more environmentally friendly. A geothermal system was installed and energy usage for heating and cooling the building has been cut in half. Interior windows were added to allow for natural light in a windowless office, which also enabled hall lights to be turned off in some areas. Bills explains that the building has double-pane windows, but insulating blinds, an upcoming project, will be installed at the large front windows. The blinds have tracks to allow light inside, but keep the winter cold and summer heat out.

Joe Sheehan, technology coordinator, says, "Computer servers were replaced with one to utilize wasted server capacity. Also, the computers are set at power-saving settings."

Sheehan used an infrared camera to detect energy leaks in the building's structure, which then were sealed. The upstairs portion of the building is outfitted with an on-demand water heater to save energy. Exit signs were also replaced with LED lights that use only one-tenth of the energy of the old ones.

When it was time to paint the interior walls, employees chose the color of low-VOC, odorless paint that would be used for their individual offices. The old carpet was replaced with 100-percent recycled floor tiles that are made from tires. When one tile becomes damaged or stained, it can be replaced just like a linoleum tile, which saves on carpet replacement.

To allow more natural lighting into the office, two back doors were replaced with doors that have windows in the top half. This not only reduced the use of electric lighting in one area, but has improved staff morale and diminished the closed-in feeling experienced by the employees whose offices are nearby.

"It's nice to work in a green place, but it is wonderful that it is also beautiful," says Sheehan.



By Allison Fleck
Division of Water

Biennial report evaluates state waters

The Division of Water (DOW) recently released the draft 2010 “Integrated Report to Congress on the Condition of Water Resources in Kentucky” as required by the federal Clean Water Act. The report fulfills requirements of sections 305(b), 303(d) and 314 of the act, whereby states must provide a biennial report that assesses the quality of all waters and list those that are impaired or threatened.

The 2010 report data reveals that the two major causes of water bodies not fully supporting their designated uses were sedimentation/siltation and pathogens. The two major sources of these pollutants were runoff from agricultural activities and habitat modification.

The report is based primarily on results from monitoring performed between April 2007 and March 2009 in the Big Sandy-Little Sandy-Tygarts and Kentucky River basin management units (BMUs), including publicly accessible lakes in the regions. Monitoring and assessment was performed on 282 stream segments representing 1,157 stream miles in the Big Sandy-Little Sandy-Tygarts BMU and 443 stream segments totaling 2,239 stream miles in the Kentucky River BMU.

In Kentucky, water quality standards designate uses for rivers, streams and lakes. Those include (1) aquatic life (warm water and coldwater aquatic habitat), (2) primary contact recreation (swimming) and (3) secondary contact recreation and domestic water supply. While fish consumption is not a designated use, water bodies have been assessed for fish consumption based on criteria to protect human health.

All stream miles fully support domestic (drinking) water supply use for the 2008 and 2010 cycles. Of the 1,210 stream miles assessed for fish consumption, 754 miles (62 percent) fully support and 456 miles (38 percent), do not support the use. The primary cause is mercury in fish tissue. These results are essentially unchanged since 2008 in terms of percentages (65 percent versus 35 percent).

Aquatic habitat

Kentucky has nearly 92,000 miles of streams that flow to the Ohio and Mississippi rivers. To date, 9,967 miles (or 11 percent) of that total have been assessed for coldwater and warm water aquatic habitat uses. Of the assessed miles, 52 percent fully support this designated use while 48 percent do not. This number represents a 1-percent increase in miles not supporting aquatic life use statewide since the last report in 2008. The three leading causes of impaired water quality for this designated use are sedimentation/siltation, nutrient/eutrophication and total dissolved solids.

Contact Recreation

Both bacteria and pH criteria are factors in analyzing waters for primary contact recreation, or swimming. Of the 4,762 miles assessed in the report, 1,494 miles (31 percent) fully support and 3,268 miles (69 percent) do not support the use. These findings indicate little change between the two report cycles despite the fact that the 2010 cycle exceeded the 2008 cycle by 270 stream miles. Secondary contact recreation refers to incidental contact with water, such as boating, fishing and wading.

Integrated Report to Congress

Read the 2010 report and list of impaired streams at <http://water.ky.gov/waterquality/Pages/IntegratedReport.aspx>.

Photo of Goose Creek in Clay County, Kentucky River Basin provided by Dan Carey

Of the 1,951 miles assessed, 1,330 miles (68 percent) fully support the use while 621 miles (32 percent) do not. These results are equivalent to the 2008 findings.

303(d) List of Impaired Streams

The primary purpose of the 303(d) list is to identify impairments for which a total maximum daily load (TMDL) study is needed. A TMDL identifies the maximum amount of pollutant that a water body can receive and still meet water quality standards, and allocates pollutant loadings among point and nonpoint sources. A TMDL provides information that can be used to guide restoration activities in the watershed aimed at mitigating the impairment(s) identified on the 303(d) list.

The number of impaired waters (2,416) has increased notably over the number reported in 2008. However, this increase does not represent a declining trend in water quality, but instead is a result of increased monitoring efforts in regions that previously had only a few monitoring stations on larger rivers and streams.

To date, DOW has submitted and the U.S. Environmental Protection Agency (EPA) has approved TMDLs for 175 pollutant/water body combinations. EPA has also approved delisting requests for 289 pollutant/water body combinations. Delisting approval is granted when DOW has demonstrated that a listed pollutant/water body combination no longer requires a TMDL, although the segment may still be listed as impaired for other pollutants.

Billboards to educate about open burning

By Roberta Burnes
Division for Air Quality

Motorists will be seeing a new billboard this fall along Kentucky highways. The Division of Enforcement (DENF) and Division for Air Quality (DAQ) have teamed up to create a new public awareness campaign that targets the practice of illegal open burning. The “Learn Before You Burn” billboard is being used as a supplemental environmental project in cases where open burning violations have occurred. The goal of the project is to raise public awareness of environmental regulations. The billboards are 100 percent funded by fines paid by parties who have violated Kentucky’s open burning regulations.

In the past, DENF offered violators an option of running an advertisement in the local newspaper, paid for by the



responsible parties. For about the price of a quarter-page Sunday advertisement in the larger market papers, a billboard can be leased for four weeks.

“Many people still believe it’s legal to burn trash in Kentucky,” says DAQ Director John Lyons. “The billboards

will help us educate the public about Kentucky’s open burning regulation, which is designed to protect human health and the environment.”

The first billboard will be on display in Paducah from September through November.

Matching Trees Program promotes giveaways and plantings

By Lynn True
Division of Forestry

Each year, the Kentucky Division of Forestry (KDF) grows tree seedlings and sells them to landowners and communities as well as to private and public entities for use in reforestation projects. The KDF partners with local conservation districts in promoting these projects.

During the 2009-2010 tree planting season, 96 of the 121 conservation districts purchased seedlings through the conservation Matching Trees Program and took advantage of KDF’s offer to match a portion of their purchase with white pine seedlings. The overall purchase and match resulted in nearly 250,000 seedlings distributed and planted last season. The Matching Trees Program is the foundation for many tree giveaways and tree planting events held during Arbor Day and Earth Day celebrations, and KDF is thankful for partner agencies that help to make these events a success.



Genelle Jones (left), a forest ranger technician in Leslie County, assists students from Stinnett Elementary with planting persimmon, black oak and Northern Red Oak during an Earth Day celebration. The event was part of the Matching Trees Program. KDF photo

Explore community revitalization in central Appalachia

By Herb Petitjean
Division of Compliance Assistance

All too often, communities in central Appalachia are faced with properties that cannot be redeveloped or reused due to real or perceived contamination. These properties can include abandoned factories and hospitals, former gas stations, dry cleaners, illegal drug labs, old dumps and abandoned mine lands.

The Kentucky Brownfield Program invites you to participate in a first-ever, one-day event on Nov. 3, to explore how federal, state and local programs, both governmental and nongovernmental, can work together to turn these properties into productive areas that can revitalize a community.

Participants will enjoy interaction, engagement and active problem solving. If you are passionate about your community, join us at Greenbo Lake State Resort Park. Registration and event information can be found at <http://dca.ky.gov>

Awards

Louisville Water Co. celebrates 150 years

Produces “best tasting” tap water in Kentucky and Tennessee

By Allison Fleck
Division of Water

RIGHT: This historic photograph shows the 1860 pumps that were manufactured on a model from Cornwall, England. **BELOW:** Sprinkler wagons helped keep the dust down on city streets in earlier days. Courtesy of the Louisville Water Co.

Water produced by the Louisville Water Co. (LWC) is the “best tasting tap water” in Kentucky and Tennessee, according to judges for the annual contest sponsored by the two-state section of the American Water Works Association. National judging will take place in June 2011.

This is a repeat performance for the Louisville utility, which won the national

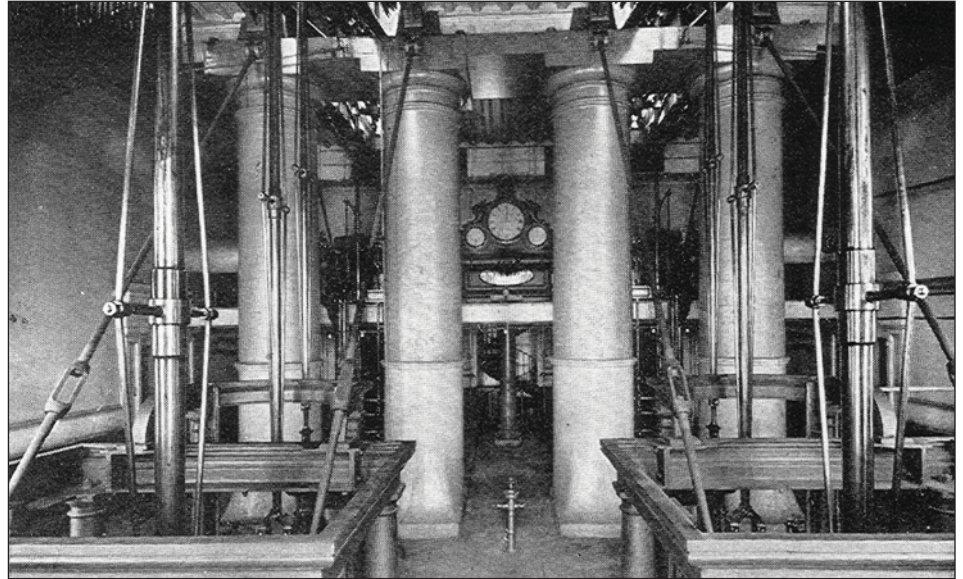


award in 2008. The company calls its product “Pure Tap” to promote the taste and health benefits of tap water.

This year’s win comes during the company’s 150th anniversary. On Oct. 16, 1860, LWC pumped water to its first 152 customers. It now serves more than 780,000 people in the Louisville Metropolitan area as well as parts of Bullitt, Oldham, Shelby, Spencer and Hardin counties.

In honor of the historic event, the utility is performing a \$2.2 million restoration on the iconic Classical Revival temple-style pumping station on the bank of the Ohio River. It was designed by Theodore Scowden and Charles Hermans and housed the Cornish steam engines.

“The company’s founders wanted the water works to be visually pleasing,” said



Kelley Dearing-Smith, manager of strategic communications for LWC. “They believed if the facilities looked beautiful, people might be more accepting of the company. Back then, people thought it was absurd that they should purchase water when they could get it for free from wells. But deaths from cholera and typhoid were rampant, and treated water became more appealing.”

Because the pumping station and water tower have National Historic Landmark status, the project qualified for a tax credit of \$180,000 under the Kentucky

Heritage Council. The project includes mortar repair and repair or replacement of decorative exterior capitals and moldings. Crews will also replace the slate roof and repaint the structure.

The Cornish engines operated almost daily until 1912, after which the station variously housed a garage, a warehouse and the Louisville River Institute. Since 1977, the station has been the home of the Louisville Visual Art Association.

The public is invited to LWC’s Oct. 16 open house from 10 a.m. to 4 p.m. at the water tower at 3005 River Road.

Water Works: 150 Years of the Louisville Water Co.

Louisville Water is partnering with the Frazier International History Museum for a six-month exhibit highlighting the company’s history of innovation and quality. The exhibit opens Oct. 23, and among the archives are:

- More than 800 photographs, many dating from 1858 to 1900, that show the original pipe, water works facilities, the Crescent Hill Reservoir and landmark filtration experiments conducted by George Warren Fuller in 1896.
- Film of the working steam engines and crews cleaning the reservoir with mules.
- A “mud pump” from the turn of the century.
- Original hand-drawn sketches of the water tower, pumping station, gatehouse and reservoir.
- Hand-written meeting minutes that capture public reaction to the idea of paying for water.

Kentucky ecologist chosen for International Leadership Program

Martina Hines, an ecologist with the Kentucky State Nature Preserves Commission (KSNPC), has been selected to participate in the first leadership program sponsored by NatureServe. NatureServe is a nonprofit umbrella organization of natural heritage programs throughout the Americas.

NatureServe and the American Express Foundation have partnered to provide free leadership training for 20 international members of their network. The “*Leader to Leader*” training is designed to provide opportunities for career advancements in conservation and improve the effectiveness of individual natural heritage programs and the NatureServe network.

Under the guidance of professional leadership trainers, participants will seek to accomplish their program’s goals over the course of one year. Goals include acquiring knowledge and practices that increase the participant’s effectiveness in their current sphere of influence, building a foundation for future leadership roles, learning more about NatureServe and its leadership opportunities and emerging with a stronger personal network to support their current and future careers.



Martina Hines. Photograph by KSNPC

Commission receives Safety Award

The Kentucky State Nature Preserves Commission (KSNPC) recently received the Executive Safety Advisory Committee safety award for achieving 12 months of work in the previous year without experiencing any time loss due to injury. The award is designed to support all programs that intend to reduce occupational injuries.

In 2009, KSNPC staff worked an estimated 42,900 hours with only six injury occurrences and no time loss to injury.



Leslie Isaman (left), with the Kentucky State Nature Preserves Commission, accepts the safety award from Personal Cabinet Secretary Nikki Jackson.

Photo by KSNPC

CHIA revisions

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watershed. These impacting features can include wells, drinking water take-outs, springs, exceptional waterways, areas unsuitable for mining, aquatic habitats, source water protection and well-head protection zones, water quality sampling points, as well as locations and descriptions of all active, released and pending mine permits.

To aid in these assessment efforts, the federal Office of Surface Mining (OSM) has committed more than \$325,000 to DNR to hire and train interim employees to compile historical water quality data, write watershed characterizations and interpret modeling results. The funds will also help defray some of the laboratory analysis expenses. The U.S. Environmental Protection Agency provided \$50,000 for field sampling equipment such as flow meters and pH/conductivity instruments, and the coal industry committed funding for on-going trend station expenses.

According to DNR Commissioner Carl Campbell, these funding sources allow the department and its counterparts at OSM to ensure that the watersheds in Kentucky’s coalfields are adequately guarded from the long-term effects of coal mining.

“The analysis of this data will help us determine the extent to which mining and other activities are affecting Kentucky’s critical watersheds. This will be critical to our goal of minimizing any negative impacts to these areas,” states Campbell.



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Seedling nurseries: growing trees for healthy and productive forests



Each fall, nature provides a spectacular display of color as native trees and shrubs finish out the growing season. Although cool temperatures and morning frosts often get credit for the beautiful colors, in reality, fall colors are also influenced by sunlight, water and leaf pigment.

Chlorophyll, the green pigment, provides leaf color throughout the growing season. In the fall, the production of chlorophyll slows due to shorter days and decreased sunlight. As the chlorophyll breaks down and disappears, other pigments begin to show. The yellow pigments, carotene and xanthophyll, give species such as redbud, hickory, birch and baldcypress hues of yellow and gold. Some plants produce red pigments known as anthocyanins that are responsible for the reds and purples seen in maples, blackgum and some oaks. The tans and browns of most oaks are caused by tannins that accumulate as the chlorophyll disappears.

There are a few coniferous trees—also known as deciduous evergreens—that display color. Baldcypress is a cone-bearing species that loses its leaves in the fall. The foliage turns copper or russet and drops to the ground leaving a layer of soft needles.

The Kentucky Division of Forestry's seedling nurseries offer nearly 50 different species including hardwoods and conifers with

beautiful fall foliage. For more information, visit <http://forestry.ky.gov/statenurseriesandtreeseedlings/Pages/default.aspx>.

*Just the Facts: Baldcypress (*Taxodium distichum*)*

- **Growth:** Baldcypress is a large tree that may reach heights of 100 feet to 150 feet. The trunk is buttressed and fluted at the base in extremely wet areas. When growing in water, it has shallow roots that often rise above the soil in the shape of cones called pneumatophores, or “knees.” The knees are thought to function as the trees’ means of obtaining oxygen for the roots during flooded conditions.
- **Sites:** A wetland species that grows along rivers, streams and creeks as well as swamps with slow-moving water.
- **Range:** Extends from Delaware Bay south to Florida and west to Texas and southeastern Oklahoma. It is also found inland up the Mississippi and Ohio rivers north to southern Illinois and Indiana.
- **Human Uses:** A popular ornamental tree, grown for its light, feathery foliage and yellow to orange-brown fall color. The wood is used in the construction of boats, bridges, docks and marinas because of its resistance to decay even in high-moisture sites.
- **Wildlife Uses:** Branches provide nesting places for bald eagles and osprey. Rotting knees are used as nesting cavities by warblers, and catfish spawn beneath cypress logs. Wild turkey, wood ducks, evening grosbeak and squirrels eat the seeds.
- **Tree Trivia:** The state champion is located in Ballard County, Ky., and has a 25-foot circumference and height of 116 feet.

