
Kentucky Division of Water

Annual Report

Fiscal Year 2011



Commonwealth of Kentucky
Energy and Environment Cabinet
Department for Environmental Protection
Division of Water

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Dear Reader,

The Division of Water (DOW) is making significant progress in a number of areas, including electronic reporting, data management and program implementation. DOW is working on various fronts to ensure that as we move forward we are utilizing electronic technologies and improved data management to conduct our business.

General fund and staffing reductions have impacted the Surface Water Permitting Branch, the Water Quality Branch, the Dam Safety program and the regional office inspectors because these programs are significantly more dependent on general funds than on federal funding sources. This impact has been mitigated somewhat by DOW entering into a Performance Partnership Grant (PPG) with USEPA. The PPG allows the division to combine certain federal grants and use the grant funds according to the division's priorities. This in turn allows the DOW to use other available federal funds toward other programs, effecting a significant increase in the amount of federal funds available to the DOW.

The DOW received the FFY 2010 Nonpoint Source Pollution Control Grant Award in the amount of \$3.3 million to implement Kentucky's program. The division then awarded \$2.2 million to nine sub-grantee project contractors to implement statewide and regional water education projects, as well as development or implementation of watershed plans within five of the seven basin management units. A tenth project was funded through the re-obligation of funding from the 2007 grant year.

DEP and DOW staff are working with USEPA to provide the regulated community with an electronic submittal process for discharge monitoring reports (DMRs). This process will enable the regulated community the ability to submit their data directly to USEPA through a system called NetDMR. The projected implementation of NetDMR for Kentucky is January 2012.

DOW is using computerized Geographic Information Systems (GIS) to better understand how to manage Kentucky's water resources. GIS is a powerful tool for assessing water quality, determining water availability, preventing flooding, understanding the natural environment and managing water resources. GIS applications reveal hidden patterns, relationships and trends not readily apparent in spreadsheets or statistical packages. GIS applications can help DOW make better decisions; save money, time and resources; and communicate more effectively through geospatial visualization.

The antidegradation policy implementation methodology administrative regulation is part of the water quality standards required by the Clean Water Act. Antidegradation policy implementation has a contentious history; Kentucky antidegradation policy has been in litigation for over 15 years. The most recent revision, effective Aug. 5, 2011, corrects the deficiencies identified by USEPA after their last review. DOW has been working closely with USEPA. Kentucky obtained full approval of the antidegradation policy implementation regulation from EPA on October 5, 2011.

In October of 2010, DOW received a Notice of Intent (NOI) to sue regarding two coal facilities. This NOI resulted in DOW involvement in inspections of coal facilities. Since October of 2010, CTAB staff have performed 14 Performance Audit Inspections (PAIs) at coal sites. These PAIs included laboratory audits of 11 laboratories contracted by these companies. Subsequent to the finding of these inspections, legislation was introduced requiring certification of laboratories that conduct wastewater analyses for permitted contaminants. The legislation was passed by the 2011 General Assembly on March 7, 2011, signed into law by Governor Beshear on March 17, and codified as KRS 224.10-670. DOW is working with a stakeholder group to develop the wastewater certification program requirements. DOW began developing regulatory language and related guidance material in March 2011. A tentative timeframe of June 2012 is being considered for filing the regulation.

The TMDL Section committed to USEPA to obtain approval for 100 TMDLs for FFY 2011, which ended Sept. 30, 2011. The TMDL Section has written and received formal USEPA approval for eight bacteria TMDLs in the Bacon Creek Watershed, four bacteria TMDLs in the Townsend Creek Watershed, 40 bacteria TMDLs for the Clarks River Watershed and eight bacteria TMDLs in the Cypress Creek Watershed during FFY 2011. The TMDL Section revised and received USEPA approval for three bacteria TMDLs in the Fleming Creek Watershed and one pH TMDL in the Pleasant Run Watershed.

The Wild Rivers program has been very successful in obtaining new properties in the past year. Since August 2009, the Wild Rivers Program has purchased or is purchasing an additional 1,800 acres of land (and seven miles of river frontage) throughout the Little South Fork and Green rivers. The program has closed on a 60-acre tract on the Green River, with an additional four tracts totaling 1,600 acres scheduled to close by the end of 2012.

Sewer Overflow Reduction

Along the Ohio River, where the most dramatic water quality impacts from Combined Sewer Overflows (CSOs) are felt, the reduction in the number of CSOs has been dramatic since 2005. In the ensuing flurry of remediation undertaken by communities along the Ohio which developed CSO corrective action plans when a series of consent agreements were put in place by the U.S. EPA, the number of CSOs was reduced from 311 such overflows to approximately 246. Approval of several communities' Long-Term Control Plans is expected to abate the number of CSOs even more dramatically in the next several years.

Moreover, Ohio River CSO communities which have quantified overflow volumes have achieved flow reductions from CSOs by an average of 50 percent in the last six years. Again, approval of Long-Term Control Plans will contribute further to the water quality improvements yielded by those plans. Similar progress is occurring in several Kentucky communities that discharge to receiving waters other than the Ohio, and those reductions will be documented more precisely during the next few years.

This year, DOW personnel are working to upgrade the state SDWIS system. The federal-level SDWIS helps USEPA track information about public water systems and their compliance with drinking water regulations. These regulations establish maximum contaminant levels, treatment techniques and monitoring and reporting requirements to ensure that water systems provide safe water to their customers. The state-level SDWIS helps states manage their drinking water programs by compiling information on inventory, sampling, monitoring and enforcement and allowing the state to manipulate the data to provide a variety of reports. Through these reporting capabilities, SDWIS/STATE helps DOW provide consumers with important information about their drinking water. SDWIS/STATE can also assist states in meeting EPA quarterly reporting requirements to EPA for all their public drinking water systems.

For the third straight year, the number of notices of violation (NOVs) issued by DOW to public drinking water systems has declined. This translates into improved health protection for the nearly four million customers of Kentucky's public drinking water suppliers. For the calendar year 2010, DOW issued 618 drinking water NOVs compared to 745 in 2009, 866 in 2008 and 1,054 in 2007. Education, outreach, and technical assistance have contributed to improved water system performance. In addition, revisions to DOW's drinking water Engineering Plans Review regulation have clarified submittals, introduced new applications and incorporated current design standards.

The Floodplain Management Section had a challenging year due to critical vacancies and increased permit demand resulting from widespread flooding. Significant flooding events in early and mid-2010 resulted in a sustained influx of applications for recovery projects in affected communities and subsequent permit backlog. In October, more than 150 permits were behind schedule, representing approximately 60 percent of pending applications. With the hiring of a permanent supervisor and repositioning of DOW staff, the backlog was reduced. As of August, there are less than 100 project applications in-house with none of them exceeding the regulatory timeframe.

The SRF and SPAP Section assisted KIA program administrators in committing approximately \$145.7 million in SRF funds to drinking water and clean water projects to improve the lives of Kentucky citizens.

The information in this report will spell out in more detail some of the issues the division is facing and the progress we are making in protecting and manages the waters of the Commonwealth and in serving its citizenry. I look forward to the continued implementation of DOW's strategic operational plan and to facing the challenges that present themselves to the division over the next year.

Sincerely,

Sandra L. Gruzesky, Director
Division of Water

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DIVISION OF WATER MISSION STATEMENT

To manage, protect, and enhance the quality and quantity of the Commonwealth's water resources for present and future generations through voluntary, regulatory and educational programs.

The **Division of Water (DOW) Operational Plan** is intended to serve as a road map toward accomplishing its mission, taking into consideration current environmental, regulatory and resource conditions. The division has identified four major objectives in this endeavor:

1. Protect, manage and restore water resources.

- a. Develop and implement Total Maximum Daily Loads (TMDLs).
- b. Implement a nutrient criteria strategy.

2. Conduct effective water resources planning.

- a. Revise and update the guidance for Kentucky's Watershed Approach.
- b. Promote the USEPA's Sustainable Infrastructure Initiative.
- c. Plan for sustainable infrastructure.
- d. Participate in USEPA rulemaking.

3. Meet federal and state program requirements.

- a. Meet federal grant and work plan requirements.
- b. Meet state requirements and maintain progress toward achieving and maintaining zero permit backlogs.

4. Promote better management and communication of data.

- a. Implement an integrated data management system for water quality data.
- b. Implementation of Sharepoint to educate the public and assist regulated entities with compliance with program requirements.
- c. Water Availability Tool for Environmental Resources Application (WATER) implementation on Geographical Information System (GIS) terminal server.
- d. Promote better decision making through GIS and data analysis.
- e. Transition from the Permit Compliance System (PCS) to the Integrated Compliance Information System (ICIS) to improve permit compliance, tracking and data analysis.

Resource Planning and Program Support Branch

The Resource Planning and Program Support (RPPS) Branch is responsible for planning, coordinating and facilitating the administrative, financial and infrastructure functions of the division, including the development and management of the division's budget.

The **Program Support Section** facilitates division training needs, receives and pays invoices, tracks inventory and orders equipment and supplies. The

Grants Management Section manages the federal grant programs, which are used to support personnel costs, equipment, training, and travel. Federal funds are also used to support projects that are developed in coordination with the division and implemented by a variety of nonprofit groups, state universities, local governments, other state agencies and private sector companies. These projects must have a water-quality or water-infrastructure focus. The

Information Technology (IT) Section performs IT functions and manages IT needs and infrastructure. This section also manages the Tools for Environmental Management and Protection Organizations (TEMPO) database and works with program staff to implement electronic solutions that the division develops.

The **Data Entry and Management Section** performs data entry, manages the file room and processes open records requests.

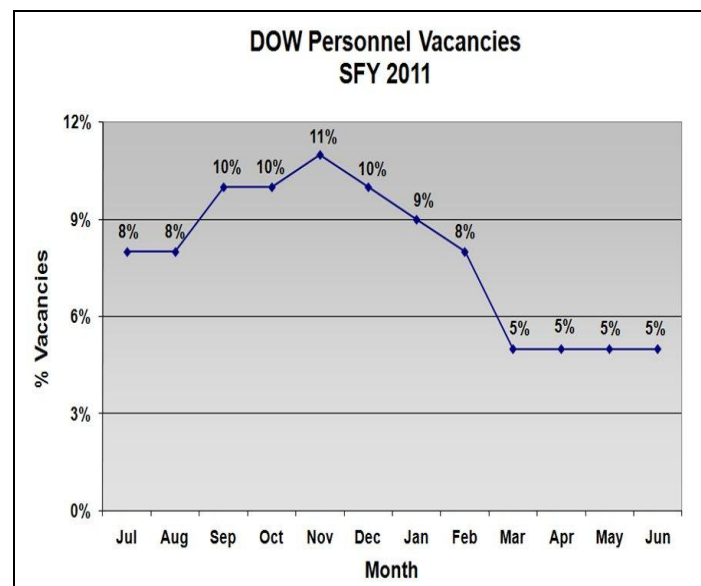
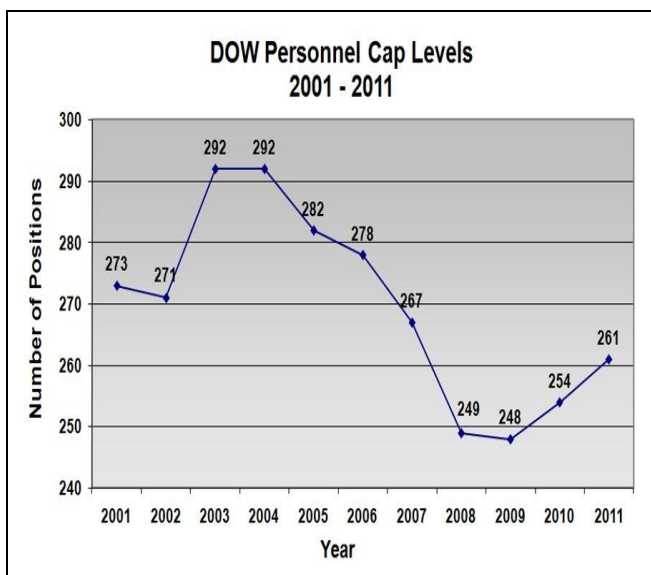
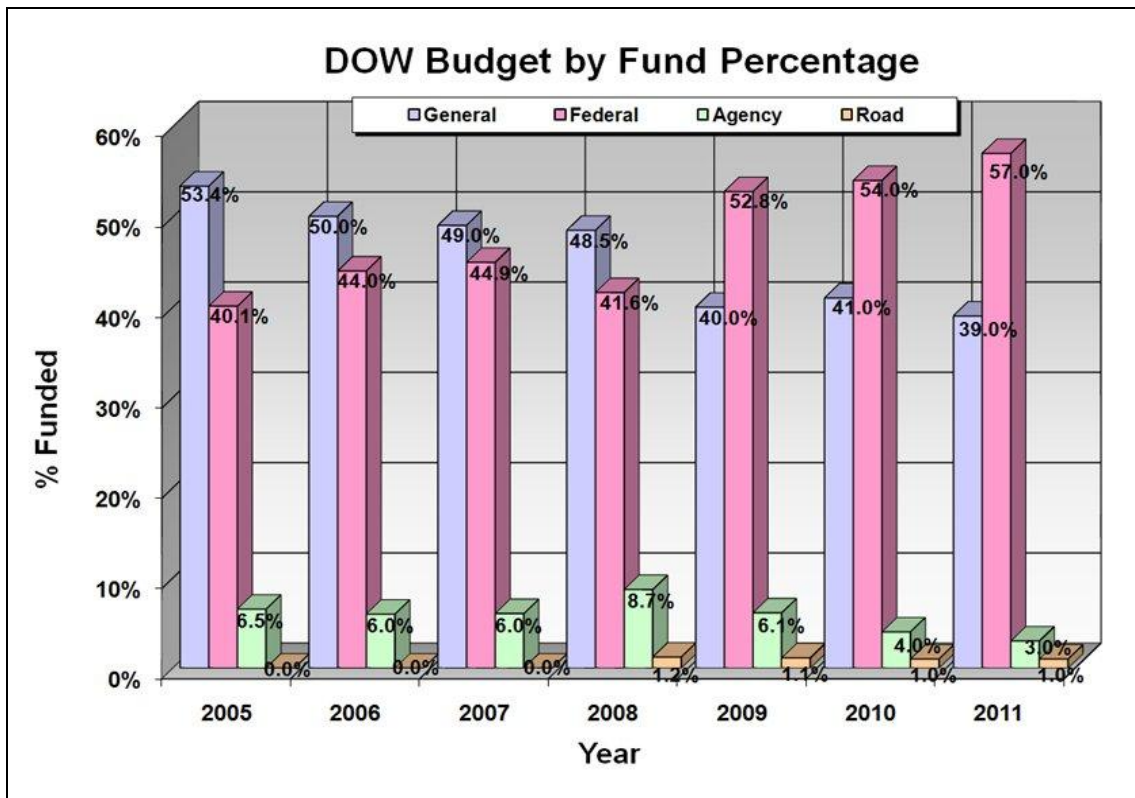
Additional duties performed by RPPS Branch staff include the development and promulgation of administrative regulations and legislation.

Budget Issues

DOW activities are maintained by general fund appropriations, federal grants from the USEPA and the Federal Emergency Management Agency (FEMA), fees collected for permit and certification activities and an annual appropriation from the Road Fund. An analysis of DOW funding for SFY 2011 shows that the division is increasingly dependent upon federal funding. This trend has continued since SFY 2009. In 2011, federal funding made up 57 percent of the agency's budget.

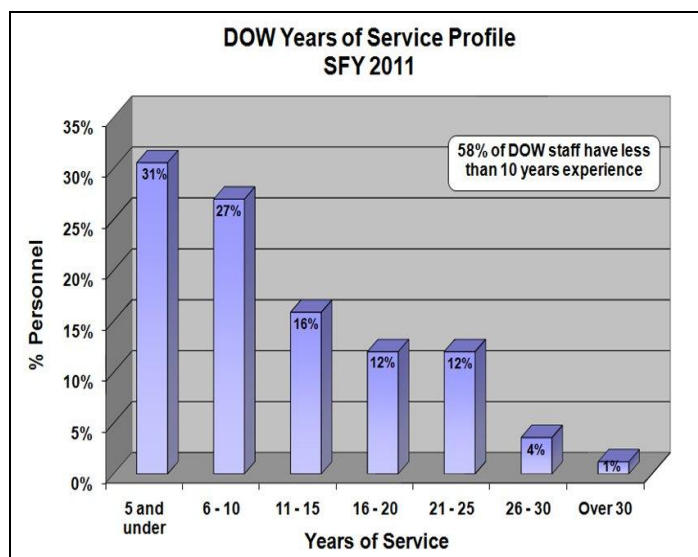
The division has the budget to maintain 261 full-time, permanent employees in SFY 2011. The number of employees the division can maintain has decreased 11 percent since 2003 -- a loss of 31 positions. This reduction in personnel has put a strain on programs and program staff.

Budget and staffing reductions have been disproportionately realized in the Surface Water Permitting Branch, the Water Quality Branch, the Dam Safety program and among the field office inspectors because these programs are significantly more dependent on general funds than on federal funding sources. This impact has been mitigated somewhat by DOW entering into a Performance Partnership Grant (PPG) with USEPA. The PPG allows the division to combine certain federal grants and use the grant funds according to the division's priorities.



Personnel Issues

Because of ongoing general fund budget reductions, the division was not allowed to fill vacant positions in the first quarter of 2011. This led to an 11 percent vacancy rate (28 positions) by November 2010. DOW has successfully decreased its vacancy rate to five percent (12 positions) by the end of the state fiscal year.



An analysis of DOW personnel based on years of service shows that the division is following the national trend of a younger workforce as we see the baby boomer generation continue to retire. Currently, 58 percent of the division's workforce of 252 filled positions has less than 10 years of experience. The number of staff with less than 10 years of experience has increased by three percent since 2008 and will continue to grow over the next 10 years. Because of this continued trend, the division is expending more resources for employee development.

Newly Effective Regulations

The Division of Water continues to update its administrative regulations to remain current with federal law and changing technologies. Six amended administrative regulations became effective in SFY 2011.

- **401 KAR 5:006 “Wastewater planning requirements for regional areas” (effective June 3, 2011)**

This administrative regulation establishes Kentucky's regional facility planning process for publicly owned wastewater treatment works that are, or result in, point sources of water pollution to the receiving waters in designated planning areas. The amendments decreased the financial burden to regional planning agencies, clarified language and removed outdated federal citations. To reduce the costs to regional planning agencies, the regulation no longer requires the entire regional facility plan to be developed by an engineer; only those parts that are engineering work must be developed by a professional engineer. The requirement to submit a revised regional facility plan is no longer automatically triggered by an application for federal funding or a 20-year time lapse. For regional planning agencies that do not otherwise trigger the need to submit a regional facility plan, there is an option to submit an asset inventory report. Additionally, the regulation establishes a 120-day deadline for the Energy and Environment Cabinet to review and approve or deny a regional facility plan.

- **401 KAR 5:045 “Biochemically degradable wastes: treatment” (effective Aug. 5, 2010)**

401 KAR 5:045 requires a minimum or secondary treatment or best conventional pollutant control technology for a facility that receives biochemically degradable wastes. The amendments to this regulation corrected internal inconsistencies between regulations.

- **401 KAR 5:0702 “Provisions of the KPDES permit” (effective Aug. 5, 2011)**

401 KAR 5:070 contains the basis for provisions, terms and effect of KPDES permits. The amendment corrected the regulation to make it consistent with the corresponding federal and state regulations. The regulation now cites federal requirements where applicable.

- **401 KAR 5:075 “KPDES pretreatment requirements” (effective Aug. 5, 2010)**

401 KAR 5:075 establishes the procedures for receiving permit applications, preparing draft permits, issuing public notice, inviting public comment and holding public hearings. The amendment updated the regulation to make it consistent with the corresponding federal and state regulations. The regulation now cites federal requirements, where applicable.

- **401 KAR 8:100 “Design, construction and approval of facilities” (effective Jan. 3, 2011)**

This administrative regulation establishes design plan requirements for the construction of new and expanded facilities that deliver potable water for public or semipublic use and establishes requirements for submitting plans and specifications for modifications to existing facilities. The amendments to this administrative regulation incorporate the most recent version of “Recommended Standards for Water Works,” and update “General Design Criteria for Surface and Groundwater Supplies.” Other amendments will update the requirements for professional engineer’s seal on public water supply projects, incorporate application forms to be submitted with projects and reduce the number of copies of plans required for submittal, and include an option to request a variance.

- **401 KAR 8:150 “Disinfection, filtration and recycling” (effective Aug. 5, 2010)**

401 KAR 8:150 establishes requirements for the disinfection and filtration of water in public and semipublic water systems and recycling of spent filter backwash water, thickener supernatant or liquids from dewatering processes. The amendments to this administrative regulation simply updated federal citations.

Promulgated Regulations

- **401 KAR 8:020 “Public and semipublic water supplies: general provisions” (in process)**

This administrative regulation provides general guidelines for public water systems to follow to protect public health, including reporting and recordkeeping requirements. The amendment to this administrative regulation adds a citation to 40 C.F.R. 142.16(f), which is a federal requirement for recordkeeping. This amendment is necessary for Kentucky to obtain primacy. The amendment also updates the DOW web address. The anticipated effective date is Oct. 7, 2011.

- **401 KAR 10:030 “Antidegradation policy implementation methodology” (in process)**

This administrative regulation is part of the water quality standards required by the Clean Water Act. Antidegradation policy implementation has a history of being contentious; it has been in litigation for over 15 years. The most recent revision, effective Aug. 5, 2011, corrects the deficiencies identified by USEPA after their last review. DOW has been working closely with USEPA and believes that Kentucky will obtain full approval of the antidegradation policy implementation regulation with this submission. Approval is expected in October 2011.

Information Technology

TEMPO Modernization

Tools for Environmental Management and Protection Organizations (TEMPO) is the software that the Kentucky Department of Environmental Protection (DEP) uses to maintain permit, inspection and investigation data and documentation. The DOW Information Technology (IT) Section is working with DEP staff on a TEMPO modernization project. DEP has financially committed to modernization. The TEMPO vendor, CGI, will convert the current TEMPO software to a web-based software application. CGI projects that user acceptance testing will begin in January 2012 and that the deployment will be completed in late spring 2012. Following deployment, the DOW Information Technology (IT) staff will work with DEP IT staff to create training videos for the modernized version of TEMPO. These videos will be used to train DEP/DOW staff on TEMPO.

PCS to ICIS Conversion Project

Since 2010, DOW has been working to move data from USEPA's Permit Compliance System (PCS) to EPA's Integrated Compliance Information System (ICIS). KY DOW successfully migrated its data from PCS to ICIS in February 2011; however, data cleanup has been ongoing since the migration. DOW is now entering new data into ICIS. DEP and DOW staff are working with USEPA to provide the regulated community with an electronic submittal process for discharge monitoring reports (DMRs). This process will enable the regulated community the ability to submit their data directly to USEPA through a system called NetDMR. The projected implementation of NetDMR for Kentucky is January 2012.

K-WADE Migration

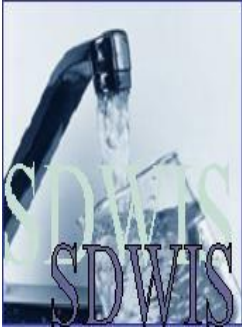
In Kentucky, water quality data is maintained through a variety of databases and other processes. The majority of the data is housed in the Ecological Data Application System (EDAS) access database. In September of 2011, DOW began the process of implementing the Kentucky Water Assessment Data Exchange (K-WADE) system to replace EDAS. DOW has a contract with Acclaim Systems to develop the K-WADE system. An initial test version of K-WADE was released in February 2011. As of July 2011, two additional versions have been released. The most current version includes a module to collect and manage biological water quality data (e.g., macroinvertebrate, algae and fish data).

There are two final parts of the system that are in development. The first is an automated process for moving the state lab database (LIMS) data directly into the K-WADE database and the second is to integrate geographic information system (GIS) tools into the K-WADE system. The LIMS automated process will be built in the next release (August/September 2011) and the GIS integration should be integrated into the final release (December 2011).

DOW program and technical staff are working on migrating current EDAS and other water quality data into the new K-WADE Oracle database. This work must be done before the K-WADE system can be put into production and used to replace EDAS. K-WADE is slated for completion by spring 2012. Once K-WADE is completed, DEP and DOW IT staff will create an automated process for moving the water quality data from K-WADE into EPA's system (WQX/STORET). In addition, DOW IT staff will be developing reporting tools to enable DOW staff the ability to analyze the data stored in

the K-WADE database. The reporting portion of K-WADE should be completed by spring 2012. DOW also plans to partner with other state agencies (e.g., the Department of Natural Resources, Division of Forestry, Nature Preserves) to enable those agencies to store their water quality data in K-WADE.

Safe Drinking Water Information System (SDWIS)



Kentucky manages drinking water data in SDWIS -- a database designed by USEPA to help states run their drinking water programs and to ensure that each public water system meets state and USEPA standards.

SDWIS contains information about public water systems and their violations of EPA's drinking water regulations. These statutes and accompanying regulations establish maximum contaminant levels, treatment techniques and monitoring and reporting requirements to ensure that water provided to customers is safe for human consumption. The Safe Drinking Water Search allows the public to access this data to more about their drinking water supplier and view its violations and enforcement history for the last ten years.

This year, DOW IT and drinking water staff are working to upgrade the state SDWIS system. The federal-level SDWIS helps USEPA track information about public water systems and their violations of drinking water regulations. These regulations establish maximum contaminant levels, treatment techniques and monitoring and reporting requirements to ensure that water systems provide safe water to their customers. The state-level SDWIS helps states run their drinking water programs by compiling information on inventory,

sampling, monitoring and enforcement and allowing the state to manipulate the data to provide a variety of reports.

Through these reporting capabilities, SDWIS/STATE helps DOW report to consumers important information about their drinking water. In many cases, states have made this information available on the internet. SDWIS/STATE can also help states meet EPA quarterly reporting requirements to EPA for all their public drinking water systems.

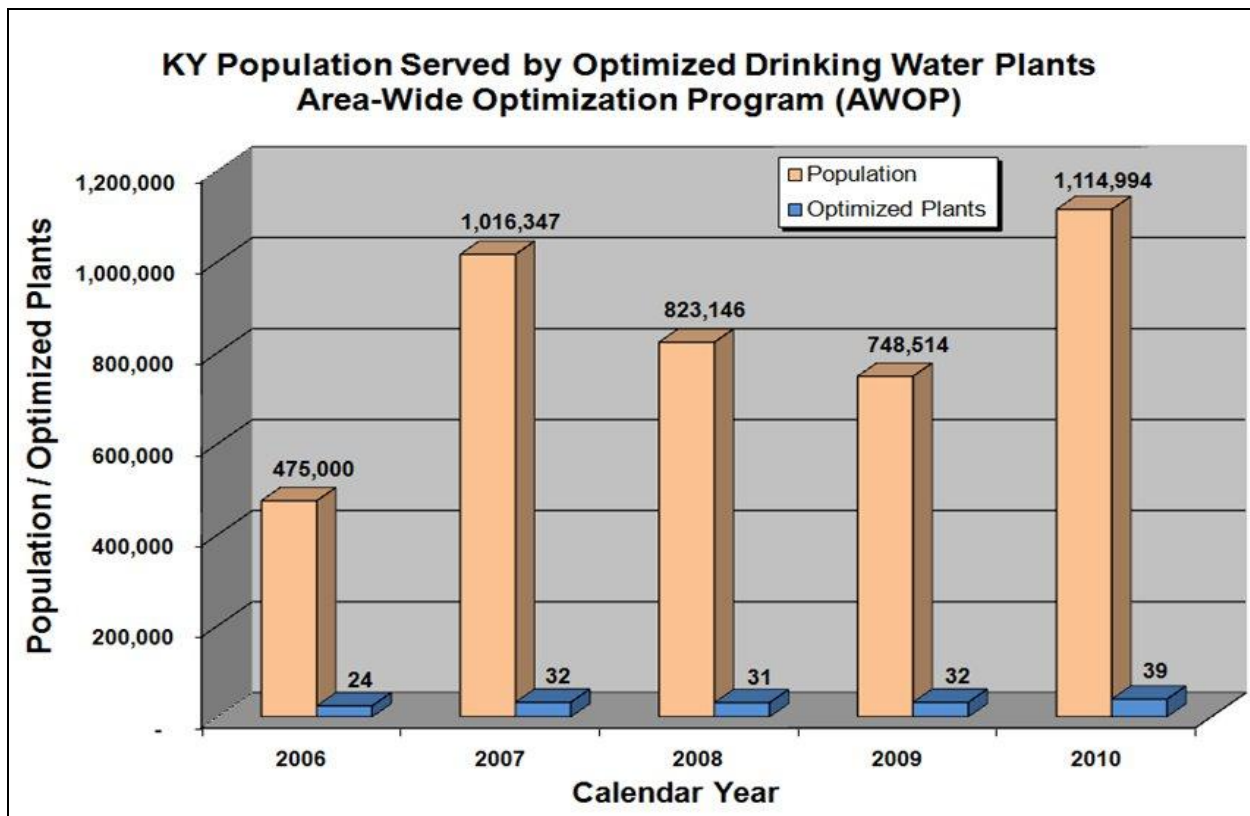
This year's upgrade has been tested and will be available for program staff to use at the end of August 2011. The final upgrade to SDWIS state is slated to be released in 2012. EPA has a new SDWIS option available called SDWIS Central, which involves running SDWIS in USEPA's National Computing Center instead of on state servers. States will not be required to move to SDWIS Central; however, states will be required to move to a system called SDWIS Next Generation sometime in the fall of 2014. DOW has not decided whether it will go directly to SDWIS Next Generation or whether it will move to SDWIS Central. A decision is expected before the end of 2011.

Drinking Water

Area-Wide Optimization Program

The Area-Wide Optimization Program (AWOP) seeks to optimize the performance of surface water treatment plants. Treatment plants that are properly designed can generally attain the optimization goals, which are more stringent than compliance goals, with operational adjustments. DOW drinking water program staff work with water treatment plants that protect the public from a broad range of health risks from waterborne contaminants. They perform a comprehensive performance evaluation

of the treatment system, operation and administration of the plant to determine if the plant is capable of being operated to meet the optimization goals and to determine any limiting performance factors. Because state drinking water programs have direct contact with treatment plants, state programs play the major role in implementing AWOPs. State staff develop criteria to prioritize systems and evaluate system performance. Then, they use the most appropriate tools and assistance to optimize system performance and address public health risks.



The drinking water AWOP continued its focus on optimizing water plants for turbidity and microbial removal. As a result, over 1,114,994 citizens in Kentucky were provided with water made safer from microbial exposure. Kentucky continued the DBP Performance-Based Training (PBT) event in western Kentucky that began in March 2010 involving six water systems, including several targeted by the new Enforcement Referral Policy process. (PBT transfers priority setting and problem solving skills to plant staff in an effort to achieve plant performance improvements.) DOW also developed Disinfection By-Product (DBP) optimization goals and sent them to producing systems in January 2011. DBPs form when organics and minerals present in water react with chemicals used for disinfecting water. Kentucky will begin recognizing optimized DBP systems in January 2012.

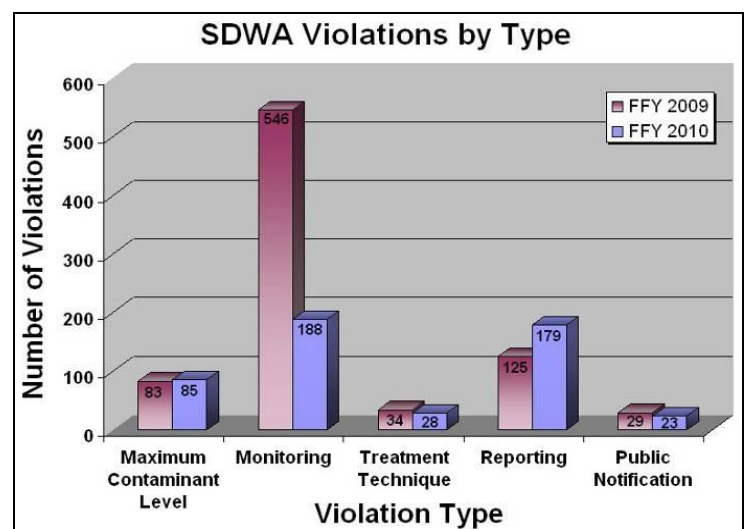
Public Water System Compliance Rates

As of June 30, 2011, the number of public water systems (PWSs) in Kentucky was 521. The number of federally regulated drinking water systems totaled 462. Kentucky’s SFY 2011 performance measures for compliance with SDWA include the percent of the state population receiving drinking water meeting health-based standards and the percent of community water systems that deliver water meeting health-based standards. For SFY 2010 through second quarter 2011, 87 percent of Kentucky’s population received water meeting health-based standards (cf. 87 percent for SFY 2010). It should be noted that these percentages include *all* public water systems (PWSs), not just those classified as community PWSs. The first quarter of FFY 2011, the percentage for all community PWSs was 90 percent. Through first quarter SFY 2011, 380 drinking water violations

were issued. Of those, 64 percent related to violations of public notification, monitoring and reporting and 36 percent related to maximum contaminant levels and insufficient treatment techniques (cf. 460 total violations for the same timeframe in SFY 2010). Weather-related conditions, such as drought and flooding, contributed to an increase in health-based violations, specifically disinfection by-products and turbidity. As of June 30, 2011, the drinking water program had submitted compliance to USEPA correctly and on time for 17 consecutive quarters.

Drinking water sanitary surveys are tracked based on the federal fiscal year. A sanitary survey is an onsite review of the water source, facilities, equipment, operation and maintenance of a PWS. The FFY 2011 schedule was complete and transmitted to the regional office and DOW central office staff in July of 2010.

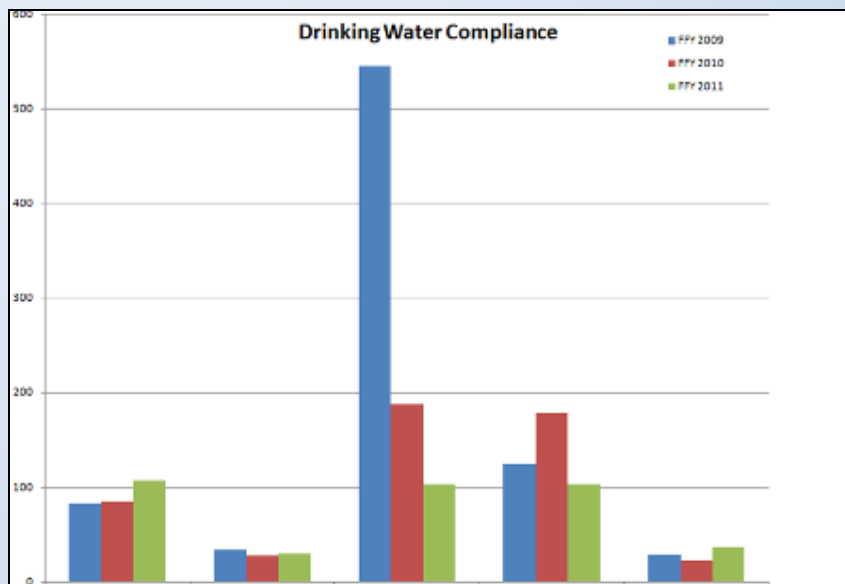
The sanitary survey schedule for FFY 2012 was complete by the end of June 2011 and ready for review by the CTAB and Capacity Development Section staff. Staff completed 175 surface water and groundwater sanitary surveys during SFY 2011 in conjunction with the Capacity Development Section, which conducted the managerial and financial assessment sections.



VIOLATIONS DOWN FOR THIRD YEAR STRAIGHT YEAR

For the third straight year, the number of notices of violation (NOVs) issued by DOW to public drinking water systems has declined. This translates into improved health protection for the nearly four million customers of Kentucky's public drinking water supply.

For the calendar year 2010, DOW issued 618 drinking water (NOVs compared to 745 in 2009, 866 in 2008 and 1,054 in 2007. It is noteworthy is that very few of the 618 violations issued last year were related to health-based deficiencies, namely, the presence of total coliform and disinfection byproducts.



reporting. While monitoring consistency and accurate record keeping are important, these violations are not directly related to public health. The violations can, however, point to areas of concern with drinking water system operation and management that could lead to more serious violations.

Education and outreach have contributed to improved water system performance. Water systems now receive a quarterly drinking water compliance newsletter. DOW also formed the Drinking Water Advisory Committee to improve coordination with other state agencies that impact drinking water, such as the Public Service Commission, the Division of Plumbing and the Department for Public Health. In addition, revisions to DOW's drinking water Engineering Plans Review regulation have clarified submittals, introduced new applications and incorporated current design standards. These changes provide for a more thorough review process for both conventional and nonconventional treatment processes and greater scrutiny of the distribution system infrastructure. Both water quality and water quantity are taken into account as plans are reviewed, furthering a system's ability to meet regulatory compliance.

Safe Drinking Water Act Primacy and Regulatory Development

Kentucky's holds primary enforcement responsibility, called "primacy," for the Safe Drinking Water Act. DOW must establish regulations and standards that are at least as stringent as the corresponding federal regulations and standards for Kentucky to retain primacy.

For SFY 2011, two primacy packages (Stage 2 Disinfection By-product Rule and Groundwater Rule) were submitted to USEPA Region 4. Kentucky currently has interim primacy for all SDWA rules, with final primacy pending on three of those rules. The DOW provided comments on the revised Total Coliform Rule through the Association of State Drinking Water Administrators.

The drinking water plans review regulation was effective on Dec. 31, 2010. Due to a USEPA comment, the general provision regulation was re-filed in May 2011. A capacity development regulation is still under divisional consideration. The bottled water regulation will be revised in SFY 2012 to remove outdated citations and streamline monitoring.

New Drinking Water Enforcement Policy

EPA initiated the Enforcement Response Policy (ERP) for FFY 2011 to replace the current Significant-Noncompliance list as a new way to target SDWA enforcement for all public water systems. ERP represents a comprehensive approach that looks at all regulations rather than on a rule-by-rule basis and sets a point system to determine priority systems. Kentucky began implementing the ERP on a trial basis in January 2010. DOW utilized

this approach and for SFY 2011 referred 16 water systems to the Division of Enforcement (DENF) for formal enforcement through an agreed order (AO). The drinking water compliance program has been working closely with DENF to refine the process and achieve a complete AO within the required two quarters. This joint effort has laid the groundwork for a smooth implementation in Kentucky. The Drinking Water Enforcement Management System was completed and submitted to USEPA Region 4 in September 2010. Region 4 responded with positive comments and acceptance of the document.

Integration with Other Agencies and Regulated Entities

DOW staff continued to work with the Public Service Commission (PSC) and the Division of Public Health Protection and Safety to coordinate common drinking water issues, such as inspections, boil water advisories, potable water service requirements, mobile home parks and unaccounted-for water. The Division of Plumbing (DOP) was also involved in discussions related to potable water service and cross connections. In June 2010, DOW approached the Kentucky Department of Parks offering guidance and assistance toward the operation and maintenance of the park's drinking water storage tanks.

DOW continued to support the Drinking Water Advisory Committee, which is comprised of regulated entities, professional organizations and related state agencies. Subcommittees associated with the advisory committee continued activities related to compliance, engineering and capacity development. A new subcommittee on cross connections was initiated in August 2009 in conjunction with DOP. DOW conducted training events related to drinking water with PSC, Kentucky Rural Water Association, Kentucky

Water and Wastewater Operator's Association, Rural Community Assistance Program and the Kentucky/Tennessee Section of the American Water Works Association.

Wastewater Laboratory Certification

DOW certifies laboratories that conduct analysis relating to monitoring requirements under the SDWA. DOW has certified a total of 102 laboratories (both in and out of state), including 46 microbiological laboratories and 56 chemical laboratories. DOW also conducts audits of the certified labs to ensure compliance with their certifications. Fourteen chemical audits were performed in SFY 2010 by the division's laboratory certification officer. The number of microbiological audits performed by Morehead State University remained at 44.

Ongoing Challenges

Several challenges face the drinking water program for SFY 2011, including the number of SDWA regulations to be implemented and related database issues. With the revisions to the state drinking water regulations complete, DOW will now need to resubmit primacy packages for older SDWA regulations to reflect those changes. The federal SDWIS database still lags behind rule implementation. Kentucky, as with other states, is creating program databases outside the federal ones and other work-arounds to track these rule requirements.

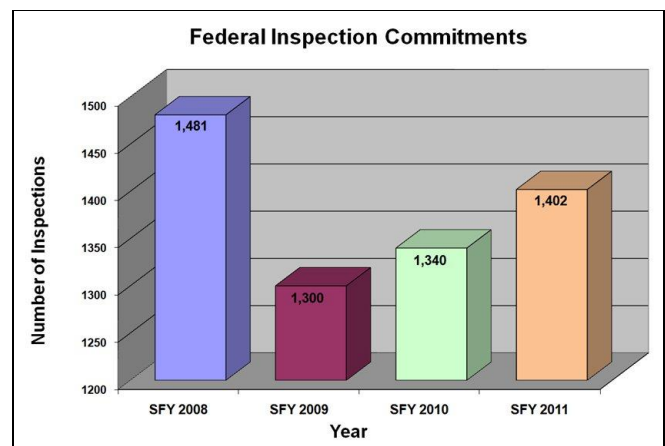
The Sanitary Survey process expanded to groundwater systems in December 2009. As noted earlier, this increased the number of sanitary surveys by 29 percent for SFY 2010 with an anticipated increase of an additional 28 percent for SFY 2011. The drinking water program continues

to be challenged to provide electronic submittal ability for Monthly Operation Reports (MORs). The program is also evaluating issues such as sub-metering, advanced treatment options, distribution system operations and water loss.

Regional Offices

Training, equipping and managing time are key to the quality of consistent inspections, technical assistance and enforcement. Federal program requirements mandate reporting percentage of inspections at permitted facilities.

The USEPA 106 grant work-plan commitment is based on the federal fiscal year. As of June 30, 2011, the percentage of completed inspections toward this commitment was 64 percent. In FFY 2010 and 2011, federal commitments were essentially the same, as follows: 50 percent majors (wastewater treatment plants [WWTPs] with one MGD capacity or greater), 20 percent minors (WWTPs with <1 MGD capacity), 12 percent permitted stormwater construction sites, 10 percent permitted stormwater industrial sites, 20 percent Phase I Municipal Separate Storm Sewer Systems (MS4s), once each seven years of Phase II MS4s, 33 percent of major CSO/SSO communities, 20 percent of minor CSO/SSO communities and 20



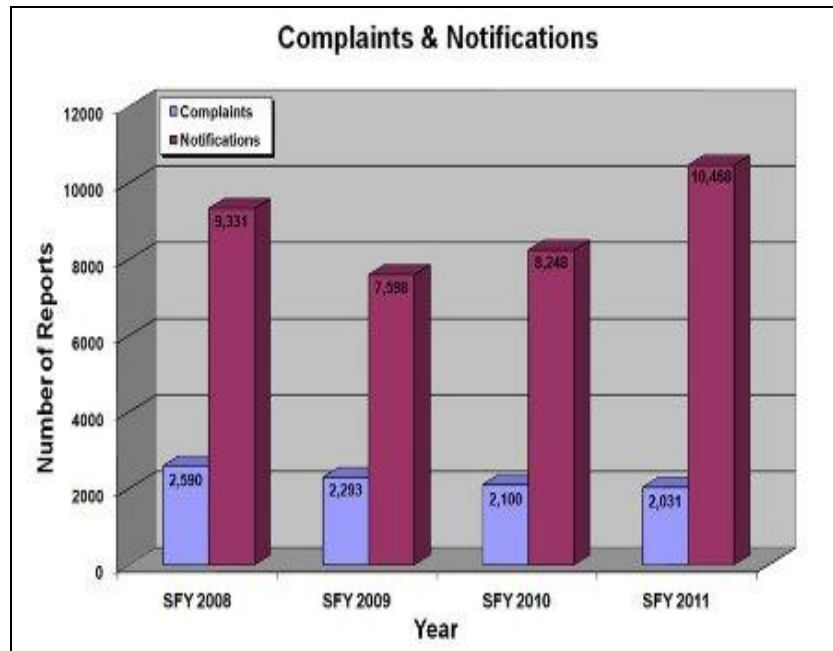
percent of permitted concentrated animal feeding operations. The only exception was the addition of committing to 20 percent of minor facilities whose discharge enters a stream listed on the 302(b) list.

State regulations also mandate inspection of facilities under state programs. DOW field inspectors, working out of ten regional offices, conducted 3,695 inspections in SFY 2011. Inspections include wastewater treatment facilities, public water systems, as well as facilities operating under general permit coverage, such as stormwater construction, industrial, agricultural, residential and oil and gas operations. In October of 2010, CTAB began inspecting coal facilities as well. Inspections resulted in the issuance of 516 notices of violation (NOVs) and 204 referrals to the Division of Enforcement for additional administrative action and civil penalties.

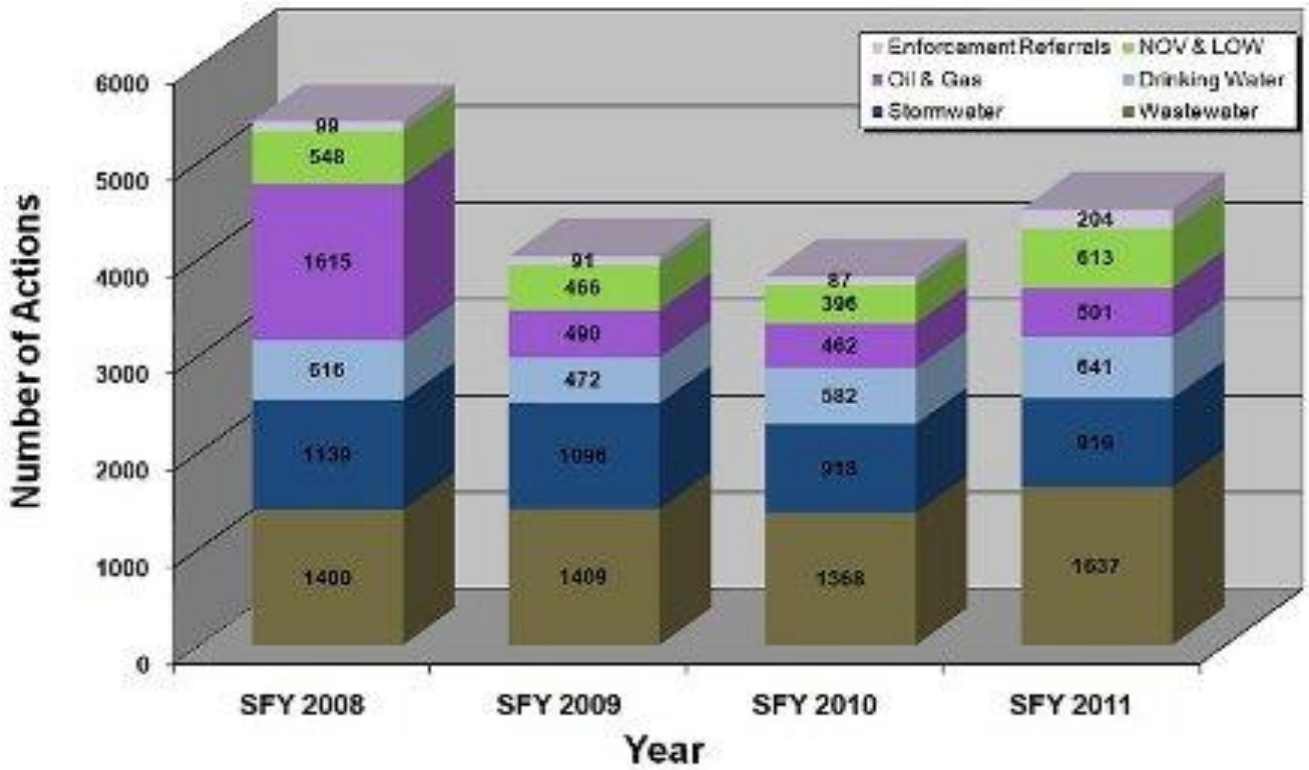
DOW inspectors must have broad programmatic knowledge (49 inspection types) and experience in addressing compliance issues. In 2010, field office

inspectors investigated a total of 2031 complaints, with a significant percentage of complaints resulting in violations of one or more regulations. Several regulations require permitted facilities to notify DOW when certain disruptions occur. Notifications consist primarily of wastewater bypasses/overflows and drinking water main breaks, low pressure or loss of pressure in a drinking water distribution system, loss of disinfection or other treatment disruption. The division received 10,468 required notifications in SFY 2011.

A large portion of the workload for DOW regional field office personnel is to respond to complaints and notifications. Responses can range from the mundane to extensive commitment of resources (*e.g.*, ice storm or flood response). DOW is challenged in planning for such activities, especially significant events, because of their unpredictable nature and the corresponding resource demands. Nevertheless, DOW inspectors continue to respond to complaints, emergencies and regulatory requirements in a timely and professional manner.



Annual Inspection and Enforcement Totals



Regulations Developed for Wastewater Laboratory Certification Program

In October of 2010, the division received a Notice of Intent (NOI) to sue regarding two coal facilities. This NOI resulted in DOW involvement in inspections of coal facilities. Since October of 2010, CTAB staff have performed 14 Performance Audit Inspections (PAIs) at coal sites. These PAIs included laboratory audits of 11 laboratories contracted by these companies. Subsequently, legislation was introduced requiring certification of laboratories that conduct wastewater analyses for permitted contaminants. The legislation was passed by the 2011 General Assembly on March 7, 2011, signed into law by Governor Beshear on March 17, and codified as KRS 224.10-670. DOW is working with an external stakeholder group to develop the wastewater certification program requirements. The DOW began developing regulatory language and related guidance material in March 2011. A tentative timeframe of late 2011 is being considered for filing the regulation.



Branch Accomplishments and Challenges

CTAB hired three inspectors and one environmental scientist, which has helped better equip the branch to regulate facilities and assist the public. The additional staff helped CTAB meet 80 percent of the goals established in the CTAB 2011 Operational Plan. SFY 2011 accomplishments include

- Implementing a pilot project utilizing tablet PCs in the field.
- Completing the Drinking Water Enforcement Management System.
- Meeting all federal grant commitments for inspections and reporting.

The adoption of some federal regulations required updates to the inspection database to reflect those changes. An extensive review of the required updates was completed during the 2010 year and implemented in the TEMPO database during SFY 2011.

The largest hurdle for CTAB in 2010 was overcoming the decline in staff experience and training new employees. In SFY 2011, 26 percent of branch staff held 0-3 years experience while only 13 percent held more than 20 years' experience.

A large amount of time is spent by the veteran inspectors mentoring the new staff. The majority of CTAB staff must carry equipment for investigation purposes. This equipment must be properly maintained; if damage occurs, equipment cannot be sent to a nearby store for repair but must be shipped to specialized vendors (usually out of state), which may hinder a current investigation or inspection.

SFY 2011 Flood Incidents

SFY 2010 brought one statewide flood event. Beginning near the end of April and continuing several weeks into May, heavy rainfall impacted the state, resulting in as much as eight inches of rainfall in less than 24 hours in some areas of the state. This event required activation of the Environmental Response Center (ERC). A total of 1,161 bypasses and overflows were reported by wastewater systems, while 15 wastewater systems reported being underwater or under partial operation.

Wet Weather Section

The Surface Water Protection Branch (SWPB) in SFY 2010 continues to implement wet weather compliance programs. These programs include developing plans to eliminate combined sewer overflows (CSOs), sanitary sewer overflows (SSOs) and other discharges related to wet weather.

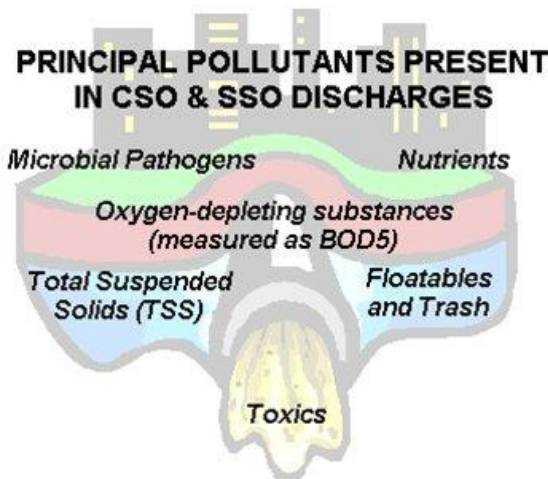
CSOs/SSOs

Combined sewer systems are an old design practice in civil engineering that involves the conveyance of both stormwater and sanitary wastewater in the same pipe. When wet weather events occur, often these systems become inundated with stormwater flow and they are designed to discharge that water, untreated, directly into streams. These events are known as combined sewer overflows, or CSOs. CSOs are legal discharges under the Clean Water Act, and the rules pertaining to this type of discharge are outlined in USEPA’s 1994 CSO Control Policy. Another type of wet weather related sewer problem occurs in separate sanitary sewer systems. Separate sanitary sewers are designed to only convey sanitary wastewater. Inundation of these systems in heavy precipitation events is a

result of inflow and infiltration caused by aging and cracked sewer pipe and illegal taps for the accommodation of drains and sumps. When these separate systems overflow it is known as sanitary sewer overflow, or SSO, which is an illegal discharge under the Clean Water Act (CWA).

Since the CSO policy was developed, communities have made some progress in updating their aging systems and minimizing these discharges of water that do not meet the water quality criteria. However, lack of progress in formal implementation of the CSO policy and correction of SSOs led the USEPA and EEC to pursue federal consent decrees and state consent judgments against some communities in order to facilitate progress in addressing the issues. The consent orders outline specific requirements for projects and plans to eliminate CSOs (and in some cases SSOs) from the system in a time certain. Many of the communities’ timeframes extend 10 to 20 years for final compliance. These consent decrees have a major financial impact on many of these communities, as the infrastructure problem is expensive to fix, costing more than \$1.8 billion in two of the largest municipal areas alone.

State consent judgments addressing CSOs, and in some cases SSOs, have been negotiated with 17 Kentucky CSO communities. These agreements were filed with the courts of appropriate jurisdiction and receive periodic progress review from the judges with oversight in the cases.



SEWER OVERFLOW REDUCTION IN KENTUCKY

There are 17 communities in Kentucky with known, active Combined Sewer Overflows (CSOs). In 2005, DOW and the USEPA negotiated consent agreements with these communities to address CSOs. There were 330 known at that time. The number of CSOs still active at the end of SFY2010 was 245. This is a 25 percent reduction in the number of CSOs in five years. (Note: Several of these communities are currently constructing separate storm and sanitary sewer systems. Upon completion of that construction, those systems will no longer contain CSOs.)

Equally dramatic is the reduction in annual overflow volume (the gallons of untreated wastewater that enter our rivers and streams during severe wet weather events).

Of the 17 CSO communities for which records of initial overflow volumes are available, reductions in volume (as of June 30, 2010) ranged from 33 to 79 percent with the statewide known annual CSO volume decrease in 2010 of 47 percent.

Clearly, the partnership of federal, state and local governments, as billions of dollars and other public resources have been utilized in attacking this problem, has resulted in many dramatic reductions in the number of CSOs and their annual volume, yielding significant benefits to the economic, environmental and public health elements of life in these communities.

Community	CSO	SSO	Consent Decree
Louisville Metropolitan Sewer District	111	100+	Federal
Sanitation District #1 of Northern Kentucky	97	126	Federal
Winchester	0	27	Federal
Lexington-Fayette Urban County Government	0	111	Federal
Frankfort	16	36	State
Henderson	11	12	State
Maysville	10	15	State
Paducah	11	12	State
Vanceburg	3	2	State
Ashland	8	0	State
Catlettsburg	5	0	State
Harlan	1	0	State
Loyall	8	0	State
Morganfield	2	0	State
RWRA (Owensboro)	8	0	State
Pikeville	3	0	State
Pineville	3	0	State
Prestonsburg	1	0	State
Worthington	3	0	State

All of the consent orders contain a series of remedial measures calculated to address CSOs, SSOs, and other unauthorized discharges referred to as an **Early Action Plan**, **Long Term Control Plan** (LTCP), and **Sanitary Sewer Overflow Plan** (SSOP). The **Early Action Plan** typically contains the following elements:

- Sewer Overflow Response Protocol (SORP)
- Capacity, Management, Operations and Maintenance (CMOM)
- Nine Minimum Controls (NMC) Compliance Report

Each community has completed development of most of the remedial measures listed above and has submitted them to the cabinet for review. Due to variances in scope and expense of correctional measures across municipalities, these documents are in various stages of review and approval.

Summary Table of CSO Remedial Measure Status

	Map	SUO	SORP	CMOM	SSOP	NMC Report	Interim LTCP	LTCP ¹	Annual or Quarterly Reports ²	Annual Review (SORP)	Other remedial measures ³	Final Compliance Date ⁴
Ashland	●	●	●	⊙	▪	●	●	○	⊙	○	▪	2017
Catlettsburg	●	●	●	⊙	▪	●	▪	⊙	⊙	▪	▪	*
Frankfort	●	●	●	⊙	●	●	●	○	⊙	○	▪	2018
Harlan	●	●	●	⊙	▪	●	▪	⊙	⊙	○	▪	*
Henderson	●	●	●	⊙	⊙	●	▪	⊙	⊙	○	▪	2017
Louisville	▪	▪	●	●	●	●	●	●	⊙	⊙	▪	2020
Loyall	●	●	●	⊙	▪	●	▪	⊙	⊙	○	◇	*
Maysville	●	●	●	⊙	⊙	●	●	⊙	⊙	○	▪	2017
Morganfield	●	⊙	●	⊙	▪	●	▪	●	⊙	○	▪	2017
Northern KY SD #1	▪	▪	●	●	⊙	●	●	⊙	⊙	⊙	▪	2025
Owensboro (RWRA)	●	●	●	▪	▪	●	⊙	○	⊙	⊙	▪	2017
Paducah	●	●	●	⊙	⊙	●	●	⊙	⊙	⊙	▪	2017
Pikeville	●	●	⊙	⊙	▪	●	▪	▪	⊙	▪	⊙	2014 ¹
Pineville	●	●	●	⊙	▪	⊙	▪	⊙	⊙	○	◇	*
Prestonsburg	●	●	⊙	⊙	▪	⊙	▪	▪	⊙	▪	▪	2015 ¹
Vanceburg	●	⊙	⊙	⊙	⊙	⊙	▪	⊙	⊙	▪	◇	*
Worthington	●	●	⊙	⊙	▪	●	▪	⊙	⊙	▪	▪	*

Review Status
▪ Not requested
● Approved
⊙ Review In Progress
○ Not due yet
◇ To Be Determined

¹ Pikeville and Prestonsburg have deadlines for separation in lieu of an LTCP

² Overall status of all annual and quarterly reports

³ Requirements that may not produce a document to be reviewed by the Wet Weather Section

⁴ A final compliance date is an enforceable date by which full compliance with the 1994 CSO Policy must be achieved; Pikeville and Prestonsburg must achieve full sewer separation by this date or submit an LTCP. These dates are included in a consent order, an Administrative Order issued by U.S.EPA Region 4, or in an approved LTCP.

* The final compliance date will be determined by the implementation schedule in an approved LTCP.

Some communities with SSOs and other unpermitted discharges are also under an enforceable order. Wet weather communities containing SSOs include Winchester with 27 and the Lexington-Fayette Urban

County Government (LFCUG) with 111. Enforcement orders for these communities typically contain remedial measures calculated to address SSOs and other unauthorized discharges.

The Wet Weather Section spent significant time in SFY 2011 focused on review and comment or approval of the various required plans and reports prepared by the communities. In addition, the consent decree for the LFCUG became effective in SFY 2011, prompting official review of previously submitted documents. The Wet Weather Section also conducted inspections of a several communities currently under consent agreement or with known or suspected wet weather problems.

Municipal Separate Storm Sewer System (MS4)

Polluted stormwater runoff is commonly transported through Municipal Separate Storm Sewer Systems (MS4s), from which it is often discharged untreated into local waterbodies. To prevent harmful pollutants from being washed or dumped into an MS4, operators must obtain a NPDES permit and develop a stormwater management program. They MS4 systems may be

- **Large MS4** 250,000+ Population
 - Louisville and Jefferson County MSD
 - Lexington-Fayette County Urban Government
- **Medium MS4** 100,000+ Population
- **Small MS4** >10,000 Population or Population Density of 1000/ sq mi
 - 100 Phase II covered under 44 permits

The MS4 program in Kentucky took another step forward by issuing the Phase I individual permit to Louisville MSD in June of 2011. At this time, all Phase I and Phase II communities that previously had been designated in the program (see listing above) are holding current permits. Universities, which were designated into the program as part of Phase II of the regulations, have begun widespread participation. Many are co-permitted with their communities, although some have chosen to implement the program independently.

Additionally, DOW has reviewed the results of the 2010 U.S. Census, which is the basis for re-evaluation of population and participation in the program. As a result of growth within these communities, Lawrenceburg and Berea will now be participating in the MS4 program. It is becoming apparent that successful implementation of this regulatory program may provide flexibility and opportunity when there are water quality issues in a community considering growth.

Floodplain Management Section – Planning for Sustainable Infrastructure

The goal of Kentucky’s floodplain management program is to protect people and their property from unwise floodplain development, and to protect society from the costs which are associated with developed floodplains.

The Floodplain Management Section participated in a pilot mentoring program with the Association of State Floodplain Managers (ASFPM) with the goal of drafting a Community Assistance Program five-year management program that integrates coordination of the National Flood Insurance Program (NFIP).

The NFIP is a federal program enabling property owners in participating communities to purchase insurance against losses from flooding. Participation in the NFIP is based on an agreement between local communities and the federal government whereby if a community will adopt and enforce a floodplain management ordinance to reduce flood risks to new construction in flood-prone areas, the federal government will make flood insurance available within the community.

Because many states do not possess Kentucky’s tools for managing floodplain resources, they rely solely on Community Assistance Program-State Support Services Element grant funds to manage risks

associated with flooding. That approach can be effective, but it relies largely on local communities, with some state support, to prevent flooding damages to people and property. This is a challenge to the permitting of certain developments within high-risk flood areas.

Floodplain Backlog Reduction

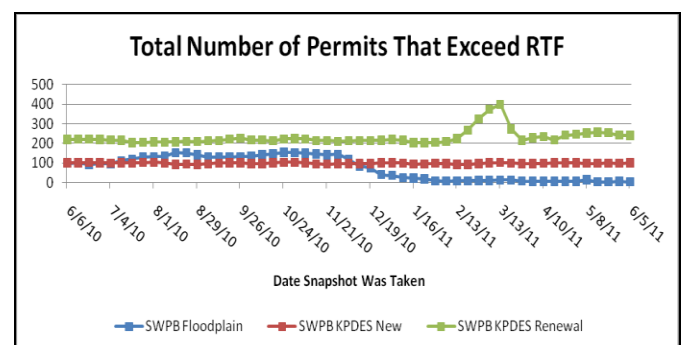
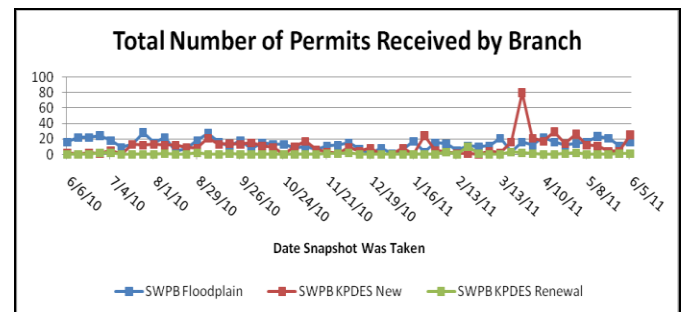
The Floodplain Management Section had a challenging year due to a critical staff vacancy and widespread flooding. Significant flooding events in early and mid-2010 resulted in a sustained influx of applications for recovery projects in affected communities and subsequent permit backlog. In October, more than 150 permits were behind schedule, representing approximately 60 percent of pending applications. With the hiring of a permanent supervisor and repositioning of DOW staff, the backlog was reduced. As of August, there are less than 100 project applications in-house with none of them exceeding the regulatory timeframe.

KPDES Backlog Reduction

One of the major issues DOW continues to face is the KPDES permit backlog reduction. An intensified effort to reduce this problem began in August of 2009. The first phase of that effort involved accurately quantifying the pending workload within the program. When TEMPO began to be used as the department’s data system, initial data came from several sources. Due to this fact, as well as some changes in implementation over the past eight years, some data concerning pending workload was inaccurate. This made tracking the pending work more difficult, which led to the need to purge some data from the system. Simultaneously, an evaluation of supporting resources was performed. In this SFY, DOW has focused on hiring and training staff to assist with permits to

reduce the backlog. The number of KPDES renewals in progress has remained steady throughout the SFY. The exception to this is in the first quarter of CY2011, when there is an uptick in the number of renewals. In December 2010, the SWPB solicited all holders of expired Kentucky No Discharge Operating Permits (2,400 KNDOPs) to renew their permits (these are included in the KPDES tracking numbers). Renewal applications began arriving during that first quarter. Because resources were being allocated to backlog reduction, many of these applications were processed.

Significant controversy remains over the technical requirements for KPDES permits for the coal mining industry. USEPA continues to change its policy stance regarding specific protection of the narrative water quality standards and various aspects of the discharge permits. This will continue to be problematic with regard to resolving the backlog of applications altogether. However, SWPB has a trained group of technical staff dedicated to working on this industry sector with the goal of 100 percent permit issuance punctuality.



Construction and Compliance Section

Whole Effluent Toxicity (WET) Program

The chemical analysis of an effluent (a municipal or industrial wastewater) cannot by itself predict its potential toxic effect. Many toxic pollutants cannot be detected by commonly available chemical analysis methods. Furthermore, different chemical combined in the same effluent can have unknown additive effects even when the toxicity of each individual chemical is well known.

WET tests were developed as a tool for evaluating the potential harmful effects of effluents discharged into surface waters. In these tests, carefully chosen indicator organisms are exposed to whole effluent and/or effluent dilutions for a pre-determined time period in order to observe the effluent's effect on the organisms and thereby approximate its potential to affect organisms within the receiving water.

Five permittees – one major industrial, two minor industrial and one major and one minor POTW -- completed Toxicity Reduction Evaluations (TREs) this year to determine those actions necessary to reduce the toxicity of effluents to acceptable levels. Some of the TREs spanned two or more years. While not all TREs produced a definitive toxicant, the more common appeared to be excess nitrates, nitrites and chlorides. Solutions included change in physical/chemical treatment to include better flocculation, settling, filtering and use of various chemical aids such as specific polymers. Some industries made changes to production activities. Some municipals discovered and addressed problems within the pretreatment and other sectors of the collection systems. Eleven additional facilities are currently performing TREs.

Pretreatment Program

The National Pretreatment Program requires industrial and commercial dischargers to treat or control pollutants in their wastewater prior to discharge to publicly owned treatment works (POTWs).

Certain industrial discharges, such as slug loads, can interfere with the operation of POTWs, leading to the discharge of untreated or inadequately treated wastewater. Some pollutants are not compatible with biological wastewater treatment at POTWs and may pass through the treatment plant untreated. This “pass through” of pollutants impacts the surrounding environment, occasionally causing fish kills or other detrimental alterations of the receiving waters. Even when POTWs have the capability to remove toxic pollutants from wastewater, these toxics can end up in the POTW's sewage sludge, which in many places is land applied to food crops, parks, or golf courses as fertilizer or soil conditioner.

The Pretreatment Program benefited from the selection in May 2011 of a new pretreatment coordinator with regulatory experience in air quality and OSHA and experience with inspections and compliance issues. One benefit was the formation of a pretreatment team with the goal of reinvigorating the program and better integrating pretreatment requirements into the KPDES permits. The team is comprised of technical staff with a variety of backgrounds, some of whom are KPDES permit writers. This integration will increase efficiency and help municipalities better manage the industrial users of their wastewater systems.

The Water Infrastructure Branch (WIB) is comprised of five sections that work together to ensure water infrastructure is properly planned, designed and operated.

The Engineering Section ensures the proposed water and wastewater infrastructure is properly sized and designed to protect public health and the environment by reviewing engineering plans for compliance with environmental regulations and engineering standards.

The Wastewater Planning Section reviews facility plans to ensure projects are properly planned to meet the foreseeable wastewater needs of the municipality while offering adequate protection of natural and cultural resources.

The Dam Safety and Floodplain Compliance Section is primarily responsible for inspecting and permitting dams, overseeing the state-owned dam repair program, and providing oversight in identifying and resolving floodplain compliance issues.

The Drinking Water Capacity Development Section assists in determining whether public water systems have adequate technical, managerial and financial capacity to deliver safe, potable water to their customers consistently and at an affordable price.

The State Revolving Fund & Special Appropriation Section oversees the administrative functions of the Clean Water and Drinking Water State Revolving Funds and the federal special appropriations.

Summary

The Water Infrastructure Branch achieved most of its SFY 2011 goals. Dam safety inspections almost tripled compared to last year. The wastewater planning regulations have been modernized to reduce the cost of planning and offer flexible options for solving a wide spectrum of wastewater planning problems.

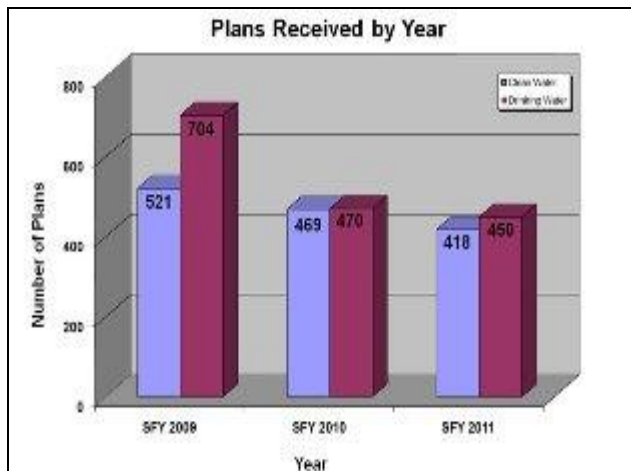
Engineering plans for water and wastewater projects were reviewed and approved within the regulatory timeframe and there is no backlog of engineering plans awaiting approval.

The drinking water sanitary surveys and capacity assessments were completed on time. The SRF Section helped the Kentucky Infrastructure Authority to commit about \$24 million to fund 10 drinking water projects and \$122.7 million to fund 22 clean water projects from the drinking water and clean water state revolving funds, respectively.

Looking to SFY 2012, more challenges and opportunities present themselves. The branch will continue to explore opportunities for dealing with the chronic floodplain compliance workload and modernizing the dam safety regulations. WIB will work to expand our engineering reviewers' capacity to review water and wastewater treatment projects and try different methods to change the way municipalities view, plan, manage and fund their infrastructure. WIB is also evaluating opportunities to share some of its underutilized resources with other programs to help the division meet its overall goals.

Engineering Section

For the third consecutive year, the Engineering Section finished the year with no permit backlog. The section received 418 clean water projects in 2011 compared to 469 in 2010, and 450 drinking water projects in 2011 compared to 470 in 2010. All projects were reviewed and processed within the 45 days' regulatory timeframe.



The decline in the number of projects received reflects the continuing distress in the housing markets. This situation has created an opportunity to reassign six engineers from the branch (three from the Engineering Section and three from the Dam Safety Section) to help the Surface Water Permit Branch reduce their permit backlog. The engineers continued to hold cross-training sessions to help reviewers master the art of reviewing water and wastewater infrastructure projects. Also, the section received training on the procuring and managing of state revolving fund projects. The Engineering Section is exploring more efficient methods to streamline and improve the overall effectiveness of

the review process. Next year the section will be updating the regulatory requirements library in TEMPO, where engineers generate and store their construction permits and approvals.

Wastewater Municipal Planning Section

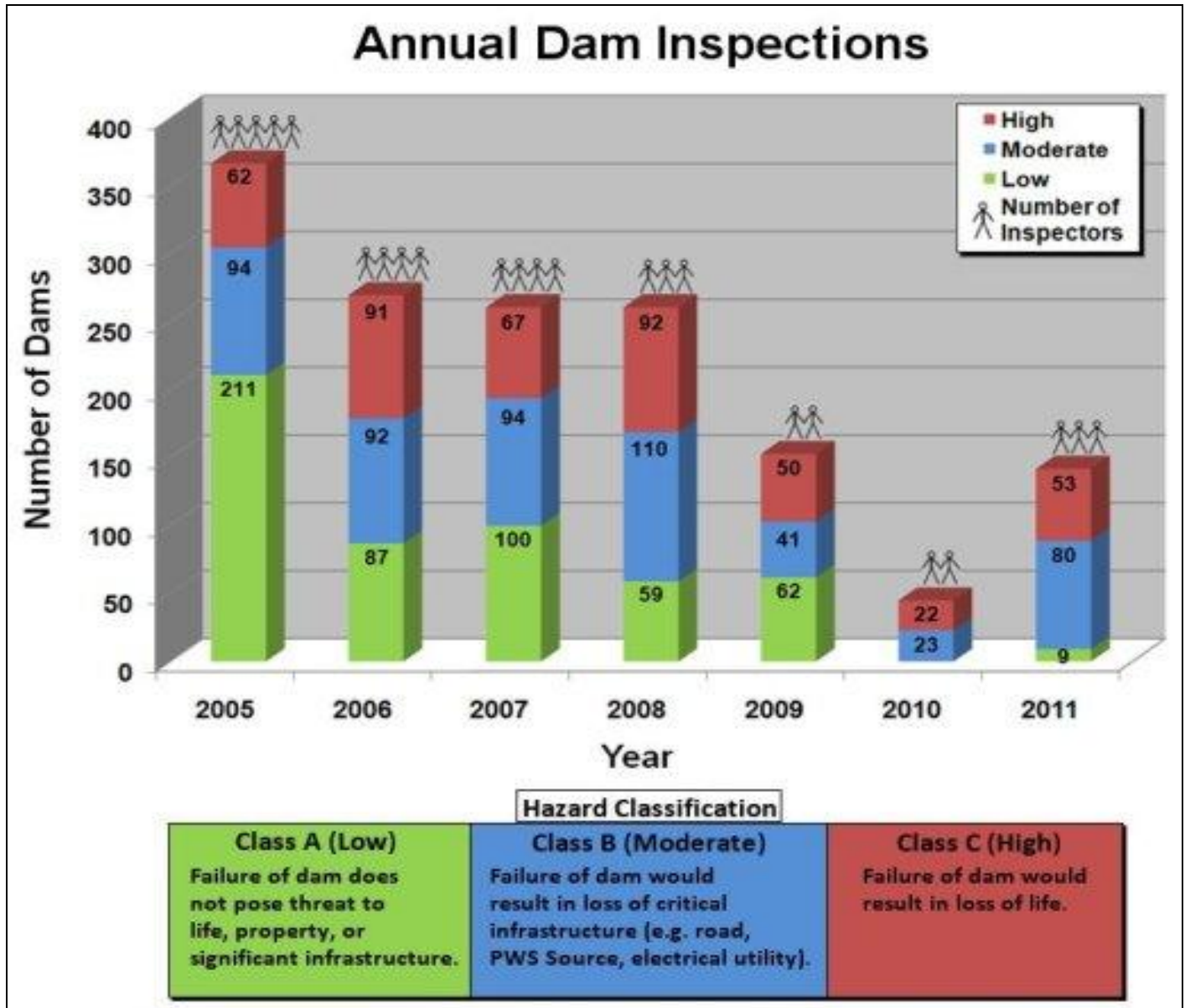
The Wastewater Planning Section (WPS) staff reviewed and approved 12 facility plans and prepared environmental assessments for 21 projects receiving financial assistance from the clean water state revolving fund. Four facility plans are currently under review. The WPS staff revised the wastewater planning regulation to streamline the planning process and reduce the cost of complying with the planning requirements while ensuring public and environmental protection. Of 235 regional planning entities, 129 have been impacted by the updated regulation. These entities will either have to update their facility plan or submit an asset inventory report by July 1, 2012. The section staff is attending Water Management Council meetings at the area development district to inform the planning entities of the latest updates to the facility planning regulations and to promote sustainable infrastructure concepts.

Dam Safety and Floodplain Compliance Section

The State-Owned Dam Repair Project (SOCR) is a program to identify state-owned dams of moderate- and high-hazard classification that do not meet design requirements, develop a plan to have that dam meet requirements, conduct engineering/design studies and construction to upgrade the dam to meet standards or otherwise mitigate the downstream risk. The section is currently working on seven state-owned dam repair (SODR) projects with project milestones and status being tracked.

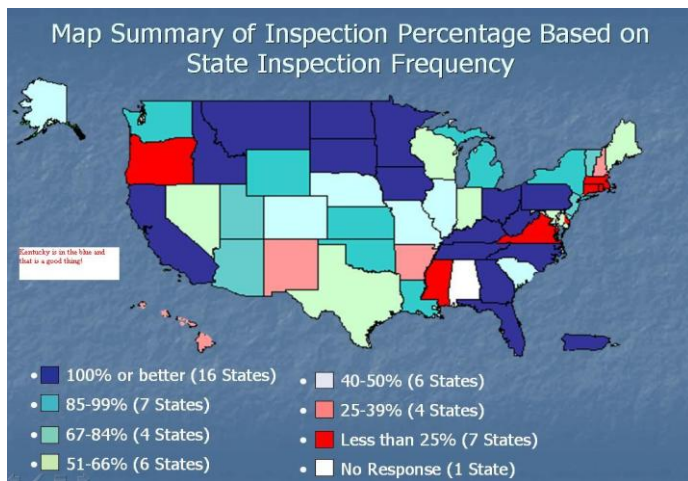
DOW is working with FEMA and Division of Emergency Management to explore the use the SODR program funds to leverage federal FEMA mitigation funds to address other high-hazard dam upgrades or mitigation activities needed in Kentucky where substantial benefit/cost ratios can be demonstrated. FEMA has awarded the state of Kentucky \$1,215,000 to characterize and assess

risks and develop mitigation strategies for approximately 200 state and local community-owned dams. A parallel FEMA-funded project will include an outreach and education component for state and local governments and citizens regarding the potential for dam failure, ramifications of dam failure on quality of life, and strategies to properly manage the risk due to dam failure.



Since 2008, the number of dam inspections has declined with the decrease of engineers in the Dam Safety Section. Although the number of inspections completed in SFY-2011 almost tripled from 2010 levels, 600 dams are overdue for inspection.

The two professional engineers in dam safety are a major resource to the Floodplain Management program as they provide exceptional technical skills on problems involving hydraulics, hydrology and GIS.



Significant time is spent on floodplain compliance and floodplain management permit issues, which challenges the Dam Safety Section in carrying out the objectives of the Dam Safety Program. The division is evaluating the options to address the needs of both the Floodplain Compliance and Dam Safety programs.

State Revolving Funds and Special Appropriation Projects Section

The SRF and SPAP Section assisted KIA program administrators in committing approximately \$145.7 million in SRF funds to drinking water and clean water projects. Demand for the SRF funds remains healthy as communities throughout the state continue to seek low-interest loans from the state

revolving funds to rehab old infrastructure and build new infrastructure. The section manages 166 active SRF and SPAP projects. A comprehensive database was developed to share information among project administrators, engineers, environmental reviewers, management, KIA reviewers and USEPA staff. The database produces tailored reports and statistical data on command.

Also in the 2011 fiscal year, hardcopies of EPA Special Appropriation fact sheets were eliminated and replaced by an electronic report created in the SPAP and SRF Master Database. The report is identical to the hardcopy fact sheet, but the information is now available at the press of a button.

The division continues to work closely with KIA SRF program administrators to improve the way the agencies solicit and rank SRF projects. All municipalities wishing to apply for SRF loans no longer apply using a Project Questionnaire Form. The Water Resource Information System database has been modified to accept SRF applications through the use of a new Project Profile form.





Cumberland County Improves Capacity

The Cumberland Co. Water District (CCWD) owns a water treatment plant that is operating beyond its design production capacity; therefore, the water district supplements its production by buying water from the cities of Albany and Burkesville.

For many years, operation and maintenance issues have been documented at the CCWD WTP, and in 2005, the District entered into an Agreed Order with the Energy and Environment Cabinet to address those deficiencies.

In 2010, Burkesville Water Works expanded its WTP. Per an inter-local agreement, signed in 2003 by both CCWD and Burkesville, CCWD intended to shut its plant down upon completion of Burkesville's plant expansion, thereby becoming a distribution-only system. In 2011, an updated Agreed Order was signed stating that CCWD will decommission its plant and both systems have entered into a water purchase contract. There is a project underway that is designed to reinforce the interconnection between the two water systems.

The elimination of the overloaded water treatment plant will reduce the potential risk to public health and lead to overall improvements to improved water and service.

Manchester Water Works / North Manchester Water Association Improve Plant Capacity, End Sanctions

In August 2005, the Division of Water imposed a limited growth water budget sanction on Manchester Water Works in Clay County. Manchester Water Works (MWW) was producing water at approximately 90 percent of its rated design capacity of 2.3 million gallons per day. Due to the fact that North Manchester Water Association (NMWA) purchased all of their water from MWW, the Division of Water also imposed a limited growth water budget sanction on NMWA.

MWW constructed a new water treatment plant with a rated design capacity of 3.2 million gallons per day and in October 2010 the new water treatment plant began operations. In June 2011, the Division of Water determined that sanctions were no longer necessary for MWW and NMWA and sanctions were terminated.

Capacity Development Section

The Capacity Development Section (CDS) promotes sustainable infrastructure (SI) every time they perform a sanitary survey (SS) of a water system (162 during SFY 2011) and during every presentation they give on the capacity development program.

A sanitary survey is an on-site review of a public water system's water source, facilities, equipment, operation and maintenance. Surveys point out sanitary deficiencies and assess a system's capability to supply safe drinking water to lower the risk of waterborne disease and identify systems that require technical or capacity development. Materials are also provided detailing sustainable infrastructure concepts and referencing USEPA and other web links for more information.

The CDS made presentations to Water Management Council members at two area development districts (ADDs). Tools for SI developed by CD staff revised and distributed "CD cd," an informative compact disc containing various documents, tools and web links. The disc includes the DOW-developed "Water Loss Reporter," which the Public Service Commission requires systems to use to track and report excessive water loss.

CD staff presented information on SI p at a meeting hosted by Kentucky Water and Wastewater Operators' Association and at two meetings held by the Area Development District Water Management Planning Councils. These presentations typically included information on asset management, capital improvement planning and water loss tracking. CD staff also provided internal training on the sanitary

survey process and sustainability to two regional offices and DOW engineers.

CD staff members regularly participate in meetings of McLean County DAWN (Driving Area Water Needs), a regionalization effort involving seven entities. They also facilitated a mentorship presentation by individuals involved in the successful Logan-Todd merger.

CD staff has worked with the SRF coordinator to revise Kentucky's prioritization formula, integrating sustainability and green infrastructure concepts. CD staff also conducted analysis of project submittals in an effort to determine why green infrastructure bonus points offered were not claimed.

CD Staff continue to work with KIA and ADD staff to revamp the workings of the Water Resources Infrastructure System (WRIS). Data will come from ADD planning staff, PSC sources and Sanitary Surveys conducted by DOW CD staff. WRIS spatial and non-spatial data have the potential to be powerful tools for comprehensive and sustainable drinking water and wastewater planning, as well as trend identification and analysis.

In the course of conducting sanitary surveys, deficiencies such as inadequate O and M manuals, lack of system maps, high water loss, rates inadequate to cover expenses and others are among those commonly noted. All too often these emergent issues are seen as "luxury items" by small systems with little or no capital, particularly in the face of demand for providing potable water in extremely isolated areas.

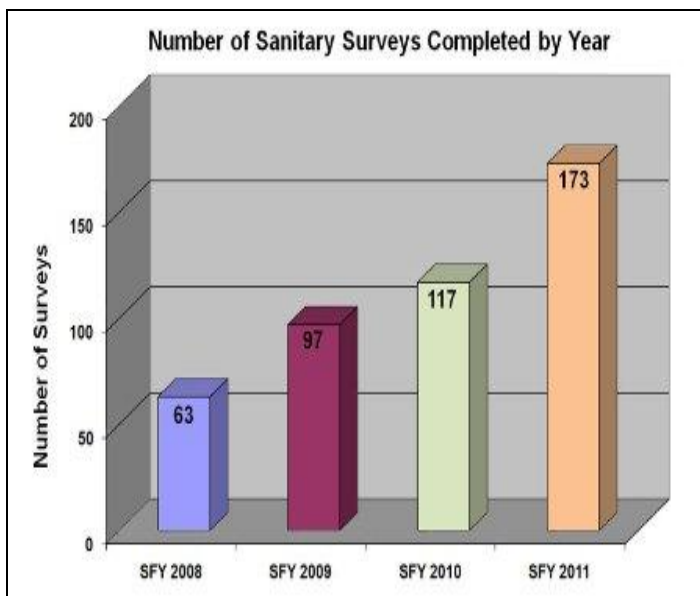
Capacity Development is partnering with the Rural Community Assistance Program to develop a program to utilize SRF Set-aside funds for systems

to correct these deficiencies. During FY 2011, Executive Order 2008-011 was secured from the Finance and Administration Cabinet, enabling the program. Contractual language is in draft and a first call for applications is expected to occur in late fall 2011. During FY 2011, 173 Sanitary Surveys were completed on time, which is significantly higher than in the last two years. The increase in the number of surveys can be attributed to the inclusion of “purchase-only” systems and additional groundwater systems into the sanitary survey rotation of simple water systems, including groundwater source systems and systems that purchase and distribute water.

Capacity Development Challenges

Systems Under Sanctions - Fourteen utilities are currently under sanctions due to deficiencies identified in the Sanitary Survey process. Sometimes there are simple reasons behind the sanctions, such as the need for a plant expansion, but often local politics hinders sound decision-making by the system management. The division struggles with how to confront and deal with these cases.

Systems not under PSC regulation -- Municipalities and other systems not subject to PSC regulation can pose a particular challenge to CD staff in helping public water systems acquire technical, financial and managerial capacity to provide safe drinking water to their customers consistently, due to lack of regulatory leverage. These systems may have excessive water loss, rates that are too low, limited production capacity or have other issues not covered in drinking water regulations that bear directly on sustainability and TMF capacity, but not be willing to accept our assistance. Part of this issue includes the lack of required training for boards and commissions, which hinders the ability of governing bodies to make informed decisions.



The Watershed Management Branch (WMB) coordinates the implementation of the watershed framework and watershed basin planning, implements groundwater management programs, administers the water withdrawal permitting program and coordinates the development of GIS and quality assurance resources to meet the needs of the division. Each section within the branch (GIS and Data Analysis, Groundwater, Nonpoint Source and Basin Team and Water Quantity Management) brings a diverse collection of DOW initiatives and outreach. Branch skills include integrated knowledge of water systems, ecosystems and public policy.

GIS & Data Analysis Section

The GIS & Data Analysis Section (GDA) consists of seven employees with various backgrounds in hydrogeology, biology, statistics, computer programming and technical data management. The section's goals are to provide support and programmatic direction to the division in the areas listed below.

Database Management

Kentucky Water Assessment Database for Environmental Monitoring (K-WADE)

GDA continues to work with RPPS IT Section and WQB on the new division water quality database, K-WADE. GAP analysis sessions with a contracted vendor are complete and a prototype is in the testing phase. K-WADE will eventually house all surface water, groundwater and biological data, making data analysis more seamless and data management much more efficient and reproducible. In the second and third phases of development, K-WADE may

also house data from permitting programs and allow for validation and use of data in water quality assessments.

Geographic Information Systems

GIS is a computer system for integrating, displaying and manipulating data related to positions on the Earth's surface. DOW is using computerized Geographic Information Systems (GIS) to better understand how to manage Kentucky's water resources. GIS can be a powerful tool for assessing water quality, determining water availability, preventing flooding, understanding the natural environment and managing water resources. GIS applications reveal hidden patterns, relationships and trends not readily apparent in spreadsheets or statistical packages. GIS applications can help DOW make better decisions; save money, time and resources; and communicate more effectively through geospatial visualization.

GDA continued to facilitate the DOW GIS workgroup and the divisional informational series "It's GIS Lunch." At least seven people have completed the GIS 101 self-study available on the intranet. GIS 201 classes continued this year with 29 DOW employees completing this course. Topics covered include ArcCatalog, selecting features, clipping, digitizing, labeling tools and features, working with and importing tables and using definition queries. A third training was offered this year fulfilling an item in the DOW Operational Plan: GIS for Management. It included a variety of topics from getting started in GIS, how it is used by staff, data management and requests for training or

In May, the DOW GIS Workgroup hosted a cabinet-wide GIS Meet & Greet to entertain the idea

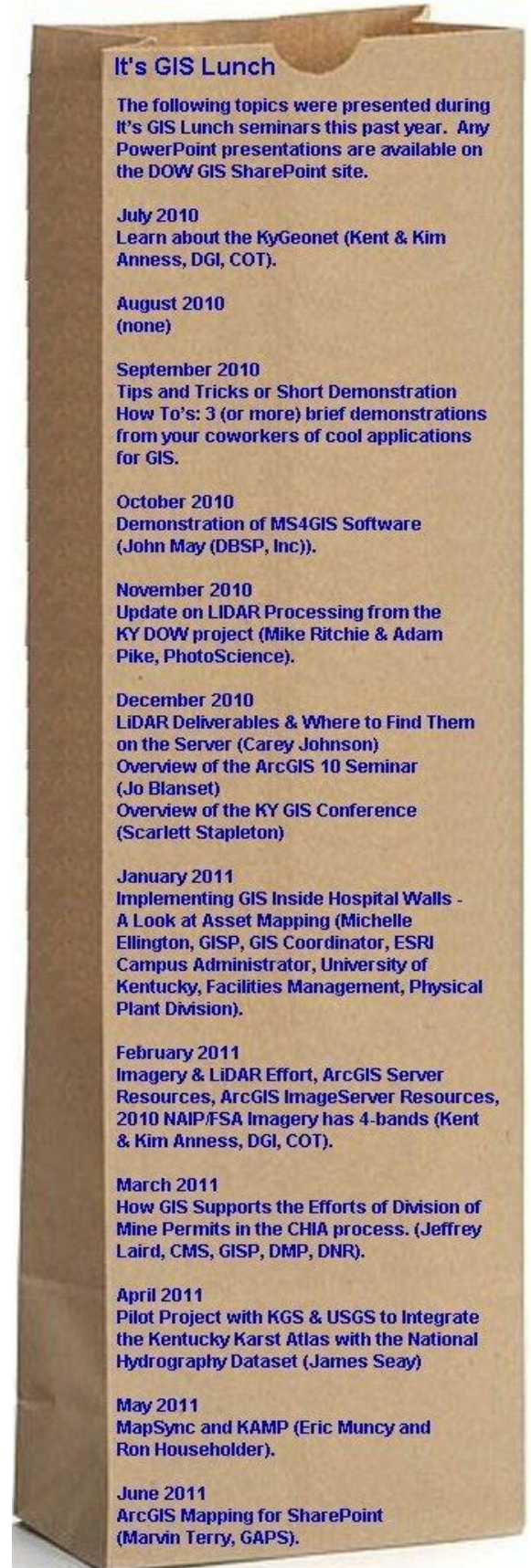
of starting a larger workgroup for EEC. Forty attended and more events are planned.

In June, the first EEC GIS Workgroup meeting was held. The 20 attendees set up several subcommittees to begin the process of identifying what issues we have and how to move in a consistent manner on them:

- Inventory of GIS skills in EEC
- Standards/QA/Metadata, including clean-up and data management (will meet 7/28)
- In-house training, sharing materials
- Keeping management on board with GIS

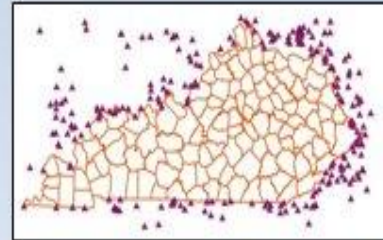
Workgroup members established a schedule to meet quarterly as a group and post monthly newsletters during the interim months. They also decided to host additional EEC Meet & Greet events to encourage participation and communication among users. Other initiatives by the DOW GIS Workgroup:

- ④ WRIS/DOW liaison workgroup.
- ④ Inter-branch assistance with mapping projects requested through the GDA Help Desk.
- ④ Coordinated with both GAPS and DGI to update the Watershed Viewer and dispose of the KY Hydroviewer.
- ④ Established liaison with Division of Mining Permits GIS Program.
- ④ Participated in Kentucky Association of Mapping Professionals (KAMP) organization.
- ④ Participated in the Geographic Information Advisory Council's strategic planning working group revising its strategic plan for all of Kentucky (not just state government). This is expected to continue into the fall.



TEMPO Location Correction Initiative

While analyzing data from the DEP department-wide TEMPO database, the GIS & Data Analysis Section (GDA) noticed quite a few Agency Interests (AIs) plotting outside Kentucky state boundaries. They worked with Owen Pierce to develop a report that lists all subject items (not merely AI locations) that plot outside the state. The first run of this report revealed 2,634 subject items that fell into this category.



The most common issue with coordinates in TEMPO (over 40%) appeared to be users entering the coordinates backwards (putting latitude in the "X_COORD" field and longitude in the "Y_COORD" field). Simply reversing the coordinates provided corrections for 945 of the 1,057 subject items. Another batch of issues involved data migration from a database to TEMPO in 2008 during which the negative sign preceding the longitude was omitted. Adding the negative sign corrected 99 of these 113. Yet another batch of 421 subject items had coordinates of 99.99 for both latitude and longitude. A program SOP was then discovered that directed users to enter these numbers to "bypass" the validation tool on the location screen. GDA recommended the SOP be revised to meet appropriate DOW standards.

After correcting 1,044 of these subject items, the remaining 1,590 were compiled into spreadsheets and distributed to the appropriate DEP programs for correction requests on a DEP shared server: <\\eecdepdata2\depshareme\TEMPO Locations>.

Over the next few months, thanks to assistance from staff throughout DEP, 2,032 corrections have been made in TEMPO. GDA worked with Owen Pierce to further refine the report to indicate subject items that plot out of the specified county – starting in August any incorrect locations based upon the report will be compiled on the shared server site with requests for corrections. Once the bulk of these errors is corrected, this report will be run on a regular basis to identify errors and ensure more accurate location information.

GDA continually stresses the importance of accurate geospatial information in any database, but especially in the DEP shared database. Many decisions in DEP are made daily using the information contained in TEMPO; they are only as good as the data on which they are based.

In 2010, GDA and GW staff worked together to secure a grant from the USGS for a project to integrate Karst Atlas data into the National Hydrological Dataset (NHD). GDA digitized dye-traced and cave-surveyed karst flow routes in the West Fork of Red River basin (the pilot study area) for incorporation into the NHD. In addition, several recommendations were submitted to the USGS, requesting alterations to the NHD database to address software bugs and limitations in the way the NHD handles karst and other natural underground hydrography features. Funding is being sought for a follow up project, which would encompass the Upper Green River sub-basin.

Certified Drillers Program Support

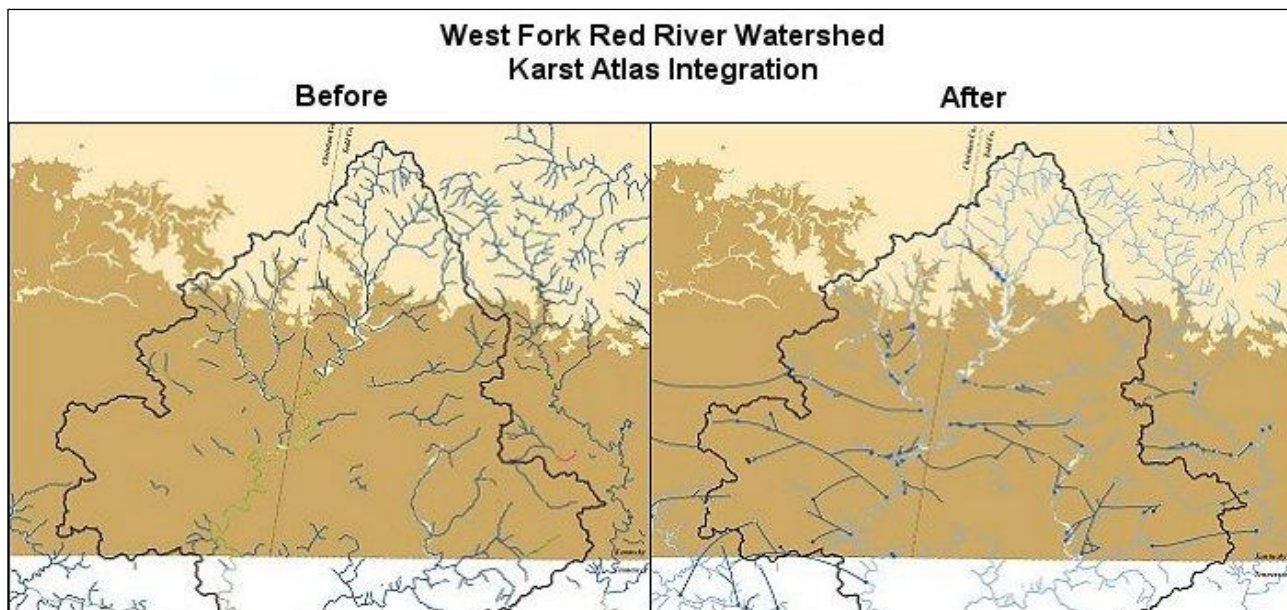
GDA staff are responsible for the receipt, review, and processing of all monitoring and water well records, well inspection forms and spring inventory forms. GDA received records for 347 water wells, 3,073 monitoring wells, 33 springs, 48 well inspections, 489 plugging events and 107 lost/destroyed well notifications throughout SFY 2011. Three hundred seven records (eight water well and 299 monitoring well) were submitted to DOW from drillers using eForm submittal.

Although plugging record processing remains current, processing monitoring well and water well installation records is still behind. With assistance from all GDA staff and the Data Entry Section of RPPS, monitoring well records have now been processed through April 2010 and water well records through January 2010. GDA further streamlined the process this past year, but the sheer volume of incoming records dampens any increases in efficiency.

GDA staff provide regular technical support to drillers regarding installation, maintenance and plugging of wells within compliance of the applicable regulations.

Online Submittal Development

GDA continued work toward identifying and converting processes eligible for online electronic submittal. The electronic version of Water Withdrawal Reporting has been used successfully since fall 2010. Two additional well record eForms (Maintenance and Plugging eForm and a combined Installation/ Plugging eForm) are currently under development.



NHD Stewardship

Since April of 2009, DOW has acted as the state data steward for the National Hydrography Dataset (NHD), which is maintained by the United States Geological Survey (USGS). GDA staff has conducted general NHD maintenance (*e.g.*, correcting gaps, branched streams, feature names) in several HUC 8 sub-basins that have been updated in the USGS National Map.

In addition to general NHD maintenance, stormwater pipelines and drainage ditches were incorporated into several sub-basins from GIS data provided by the Wet Weather Section of SWPB, including the MS4 program. To date, data for the stormwater networks for Georgetown, Owensboro, Paducah, Richmond and Northern Kentucky Sewer District #1 have been incorporated into the NHD.

Risk MAP Program

Risk MAP builds on the successes of the Flood Map Modernization (Map Mod) initiative overseen by DOW since 2004. While the focus of Map Mod was to digitally update the state's inventory of flood hazard maps, Risk MAP identifies flood risks, assesses the potential losses in a given area, plans to mitigate flood risk through state and local planning and communicates flood risk to stakeholders. Identifying (mapping) flood risk, assessing the potential losses in a given area due to flooding, planning to mitigate flood risk through local and state hazard mitigation planning activities and communicating flood risk to a wide array of stakeholders at the federal, state and local levels.

DOW has been able to leverage partnerships with other agencies and utilize state and federal funding to develop Risk MAP initiatives and collect LiDAR

data over 25 percent of the state, mainly in the mountainous regions of eastern Kentucky.

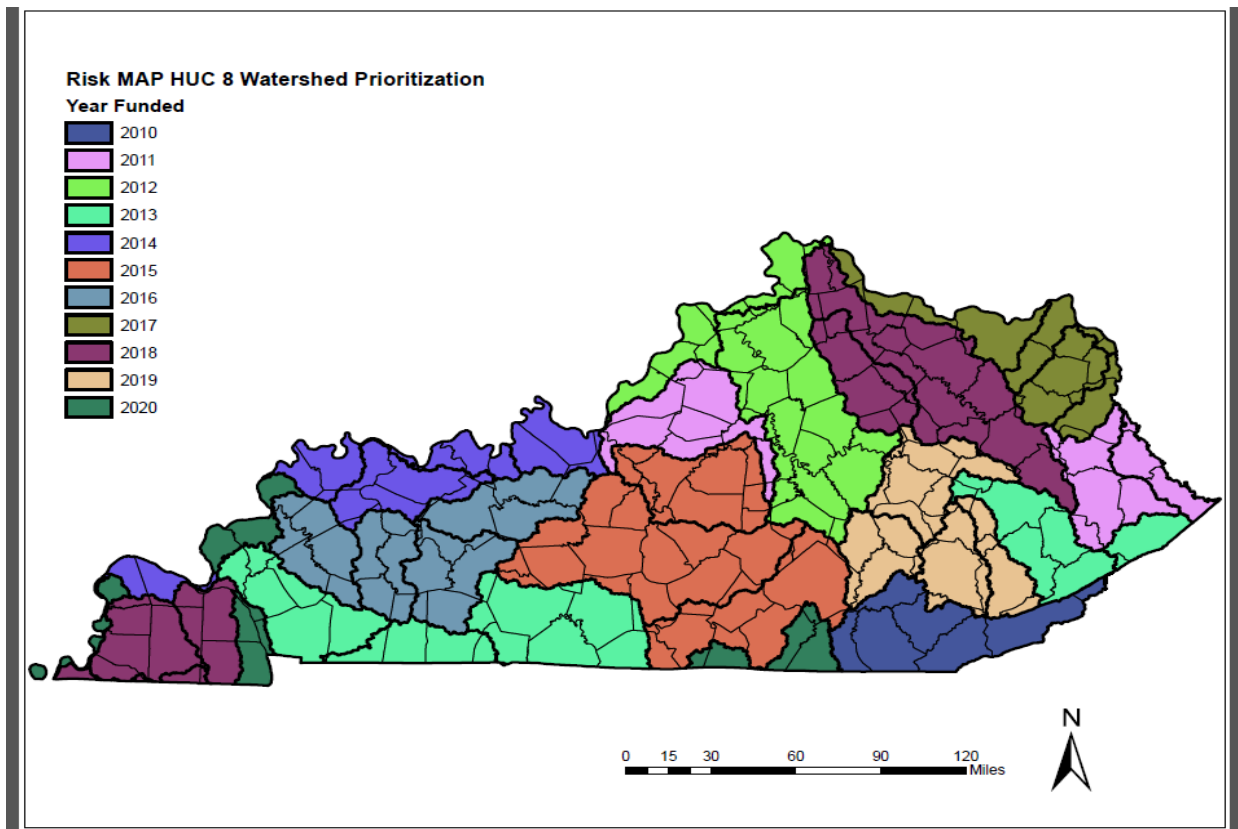
LiDAR, an acronym for Light Detection and Ranging, refers to optical remote sensing technology that can measure the distance to a target by illuminating the target with light, often using pulses from an aircraft-borne laser. Using powerful software, the data from these LiDAR reflections are collected by measuring the time it takes for the aircraft to receive the millions of laser reflections. The resulting data is then combined and converted into an image that looks exactly like the terrain below, including buildings, trees, roads and waterbodies. Engineers use this data to create flood risk maps and computerized flood simulations with a very high level of accuracy.

KDOW has completed Early Demonstration Projects in the Salt River HUC 8 and North Elkhorn HUC 12 to aid FEMA in the implementation of Risk MAP. In addition, DOW is integrating Dam Safety and Risk MAP by creating Risk MAP-type products to better quantify downstream risk due to dam failure.

The major components of Risk MAP are:

- A comprehensive assessment of the validity of engineering studies to establish flood elevations using FEMA's Coordinated Needs Management Strategy (CNMS).
- An expanded stakeholder group including, but not limited to, federal, state, and local elected officials, emergency managers, floodplain administrators, GIS specialists, property valuation administrators (PVA) and local and state planning entities.
- Engineering analyses conducted on a watershed basis.

- Flood hazard mapping on sound topography data that may include the acquisition of new topography through LIDAR or other applicable means.
- An enhanced suite of flood hazard identification and flood risk communication products including graphical depictions of changes since last FIRM, flood depth grids, percent annual chance flooding probability, probability of flooding during a 30-year mortgage, and areas of mitigation interest.
- Flood risk assessment using the FEMA HAZUS-MH program.
- Mitigation planning that will supplement the ongoing state and local hazard mitigation activities required as part of the Disaster Mitigation Act of 2000.
- Expanded and enhanced risk communication using traditional (brochures, classroom) methods, web-based mapping and outreach sites, development of training modules through the Kentucky Risk Communication Toolbox (RCT) and FEMA's Risk MAP University and social media.



Quality Assurance Program



The DOW quality assurance program (QA) encompasses all branches and is integral to the department's QA planning as a whole. The DOW QA program consists of one staff member of the GIS & Data Analysis Section.

The QA program integrates communication among the branches aided by the re-initiated DOW QA team. Potential projects for the team include data review for internal and external data sets and development and review of quality assurance project plans and standard operating procedures. Department-wide training is planned.

Specific duties of quality assurance involve the following programs, with the accomplishments of each program listed.

- Drinking Water – 51 laboratory audits under the lab certification system, 42 in microbiology, 8 in chemistry, 1 in cryptosporidium methods.
- Drinking Water and Coal Permitting Programs - Performance Audit Inspections related to coal mining permits – 14 laboratories and coal facilities.
- Drinking Water and Wastewater Planning -- Performance Testing Studies – required for all laboratories performing analysis for drinking and wastewater for compliance – 156 for wastewater, 61 for drinking water.

In addition to existing elements of the program, the QA officer became involved in the coal mining permitting process. The officer reviewed approximately 100 QAPPs specifically for coal permitting and participated on multiple interagency teams and work groups. WQB and the NPS Section of WMB also submitted approximately 20 QAPPs and SOPs for review and approval.

A division-wide group to work on data validation and data review was formed. A goal of this work group is to develop a process whereby data sets can be submitted and a standardized review can take place, the outcome being the production of “defensible, reproducible data” to be used in multiple programs (e.g., water quality assessments, TMDLs, permitting).

Groundwater Section

Certified Well Drillers Program

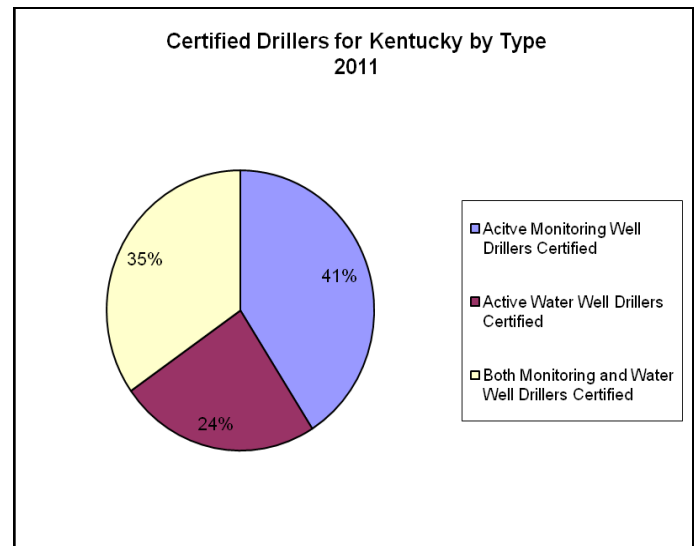
The GW Section held its annual new certification and recertification of licensed drillers in Kentucky, issuing GW issued 144 licenses to certified drillers, including 35 water well drillers, 59 monitoring well drillers and 50 dual-license drillers.

The section drafted language for two proposed statutes to regulate the installation of vertical boreholes for closed-loop geothermal systems. The proposals, requested by members of the drilling community through the Kentucky Water Well Driller's Certification Board and the board of the Kentucky Groundwater Association, were presented to membership for ratification. One version includes reporting, construction and abandonment requirements but no certification requirement. The other calls for certification of closed-loop geothermal drillers along with reporting, construction and abandonment requirements. Members of both boards will meet again in September 2011 during the Midwest Groundwater Conference to review the results of the poll, the draft statues and to discuss plans and strategies.

Groundwater Monitoring

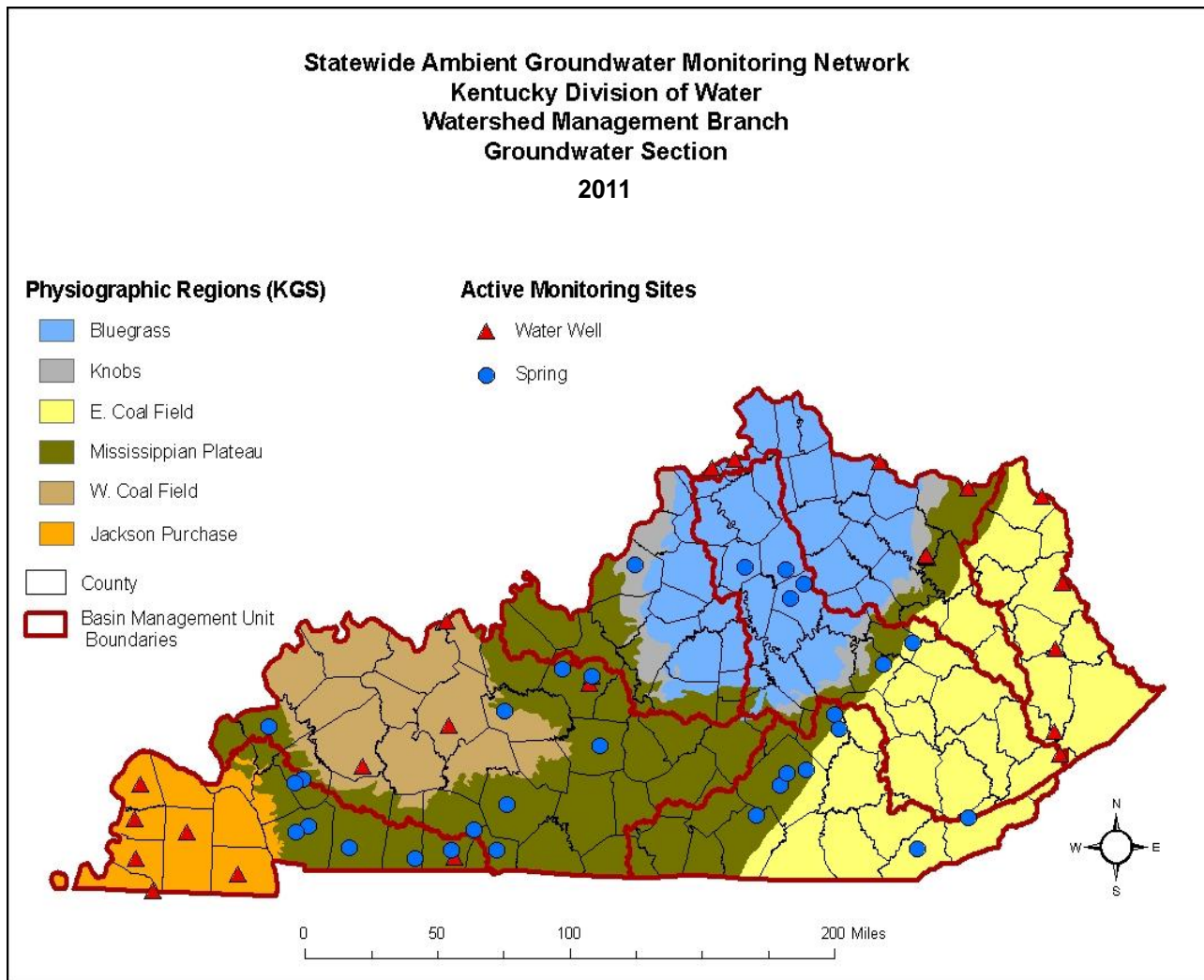
The GW Section collected 111 samples for the Ambient Monitoring Network, 16 samples for the Pesticide Memorandum of Agreement (MOA), 28 samples from one-time sites, and responded to numerous citizen complaints. The GW Section submitted the final report for the "Assessment of Nonpoint Source Impacts on Groundwater Quality in South Elkhorn Creek Basin, Central Kentucky" (NPS 0204).

GW continued field investigation for the West Pennyryle Karst study (NPS 0704), currently focused on aquifer mapping. The grant was approved and work is scheduled to begin on a statewide NPS study titled "An Assessment of Pathogens in Groundwater in Kentucky."



In conjunction with the Kentucky Geological Survey, GW has conducted a pilot study on the feasibility of adding karst data to the USGS's National Hydrography Dataset (NHD). The NHD was designed to accept the incorporation of groundwater data and a limited number of water wells and springs were included in the original dataset. The KGS and GW have compiled and digitized karst flow data for more than half of the karst regions in Kentucky.

Incorporating previously omitted subsurface flow data into the NHD provided several benefits, primarily, (1) demonstration of local deviation of karst drainage from topographic watershed divides, (2) established a baseline for mapping karst features and groundwater flow paths within the NHD and (3) improved accuracy and applicability of information used for hydrologic modeling, research and field investigation.



The karst data pilot study was a success and tracer data for the West Fork of Red River watershed were added to the NHD. The USGS is currently pursuing funding to expand the scope of this project. Results have been presented at professional conferences.



Green dye is added to groundwater to help understand water movement through karst areas common in Kentucky.

GW has responded to at least ten complaints concerning the presence of methane gas in water wells, allegedly due to natural gas exploration or the deep mining of coal. Dissolved gases in water wells present a potentially hazardous environment in the wells and homes.

GW recently partnered with USEPA, Region 4, to address proposed green initiatives (GI) for disposal of stormwater. Stormwater infiltration utilizing UIC program is becoming a popular GI for addressing stormwater needs. GW has provided USEPA with proposed guidelines to protect groundwater resources as GI are developed in Kentucky.

Groundwater Protection Plans (GPPs)

Anyone engaged in activities that have the potential to pollute groundwater is required to develop and implement a Groundwater Protection Plan, often as a requirement of a permit application. The GPP Program continues to focus on providing training through presentations and forums within various state agencies, especially those having direct contact with the public, to raise awareness of the program. For example, the GPP Program provides the Wellhead Protection Program with generic GPPs for residential septic systems for distribution.

The GPP Program has one active notice of violation against a facility for failure to submit a revised GPP. All GPPs required by DENF are reviewed on a priority basis. The GPP Program conducted 10 compliance site visits, all of which resulted in calling in new or updated GPPs from all 10 facilities.

The GPP staff advised DOW and Division of Waste Management sections on the GPP requirements relating to land application of wastes. Several farms in central Kentucky have either had to develop GPPs or withdraw their landfarming permit applications because of groundwater protection requirements. The general permit for a KNDOP now includes, as a general condition, the requirement to have a GPP. In response to drillers' requests, the Guidance Document for Installation of Closed Loop Geothermal Boreholes developed in 2009 is currently awaiting management's decision for placement on the GPP program web site.

Water Quantity Management Section

The Water Quantity Management Section is charged with administering the sections of KRS 151, KRS 224A and 401 KAR 4:220 pertaining to water withdrawal permitting, water supply planning, and drought. All three of these programs serve to fulfill the water resources policy set forth in KRS 151.110. Briefly stated, the intent of this policy is to maximize the conservation and beneficial use of water; prevent flooding; maintain the normal flow of all streams; regulate reasonably the amount of withdrawal of public waters; and provide planning of regionalization, consolidation and partnerships among governmental agencies and private parties.

Water Withdrawal Program

The Water Withdrawal Permitting program oversees all withdrawals in the state that average >10,000 gallons per day, with the exception of water required for domestic and

agricultural purposes and for steam-powered electricity generating plants. There are 714 active water withdrawal permits. Permit holders are required to keep records of daily water use and report the information to DOW on a monthly basis.

DOW has regulated water withdrawals since 1967 through a water withdrawal permitting and reporting program. For FY 2010-2011 a total of 4,452 million gallons per day (MGD), including thermoelectric power generation, were reported withdrawn from the major water use sectors in Kentucky. The largest change in withdrawals from the previous year was reported for commercial use (down 18 percent), due in large part to decreased golf course irrigation during the wet spring of 2011. Reduced water usage was also seen in the mining (down 11 percent) and industrial (down 10 percent) sectors. Water withdrawn for thermoelectric power generation increased by four percent in FY 2010-2011 and aquaculture water use increased by 11 percent.

Water withdrawal permitting actions FY 2011		
Application Type	Received	Issued
New Permits	13	8
Revised Permits	19	16
Temporary Authorizations	7	6
Water Diversions	0	0
Interim Authorizations	1	1
Emergency Authorizations	3	3
Permit Inactivations	9	9
Total Permit Actions	52	43

Reported water withdrawals and changes from the previous year for each major water use sector			
Water Use Sector	Average Daily Withdrawal		Percent Change
	2010 - 2011	2009 - 2010	
	MGD		
Aquaculture	20	18	11
Commercial	28	34	-18
Mining	34	38	-11
Industrial	235	261	-10
Public Water Supply	544	575	-5
Thermoelectric Power	3591	3465	4
Total	4452	4390	1

Reported water withdrawals and changes from the previous year for each type of water source			
Water Use Sector	Average Daily Withdrawal		Percent Change
	2010 - 2011	2009 - 2010	
	MGD		
USACE Reservoir	43.3	41.7	4
Wells and Springs	161.8	193.2	-16
Lakes and Ponds	104.7	116.8	-10
Rivers and Streams *	537.5	566.4	-5
Underground Mines	1.5	1.6	-6
Total	848.8	919.7	-8

* Thermoelectric water use has been excluded as the majority of its

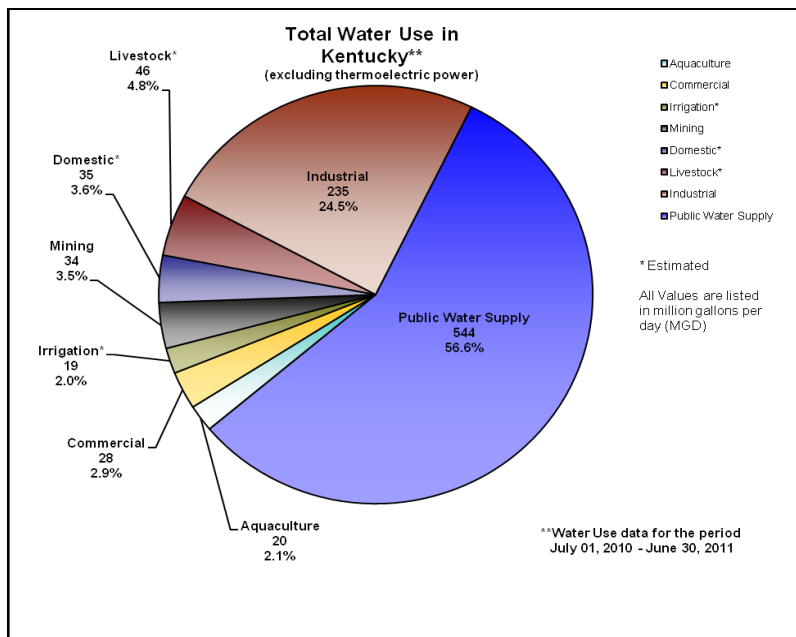
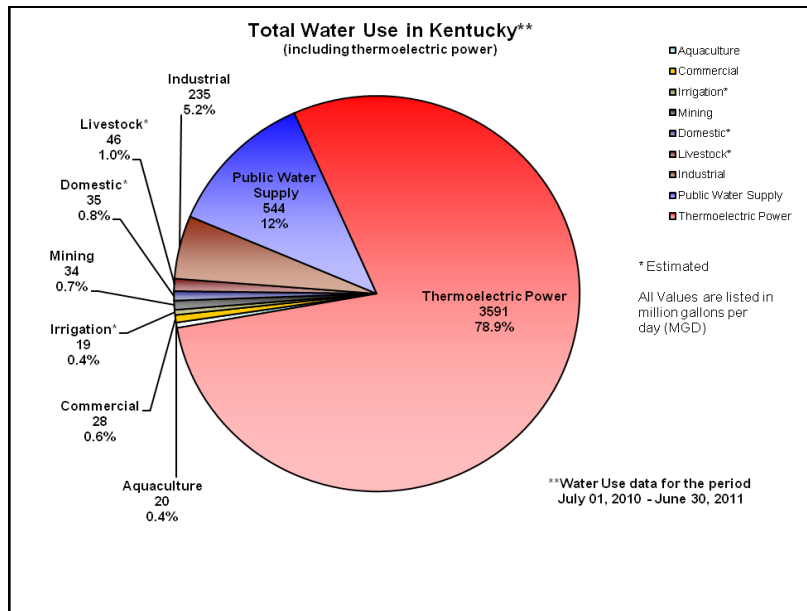
A total of 849 million gallons per day were withdrawn for uses that are regulated by DOW. Of these, surface water (rivers, streams, lakes and ponds) accounted for nearly 81 percent of the total water withdrawn in Kentucky. Total water withdrawals from regulated sources were down by eight percent over the previous year (920 million gallons per day).

Water withdrawal permitting actions were related primarily to the issuance of revised permits. Other permitting actions included the issuance of emergency authorizations (short-term authorizations to withdraw due to an emergency) and temporary authorizations (short-term authorizations related to projects that require a limited-duration use of water).

Water Use

Water used for purposes of generating thermoelectric power accounted for 79 percent of the total water withdrawn in Kentucky for the fiscal period ending June 30, 2011. A majority of the water used for power generation is not consumed and is

used primarily for cooling purposes and then returned to the source. When thermoelectric power generation is excluded, public water supply and industrial water use accounted for nearly 82 percent of the total water withdrawn in Kentucky.



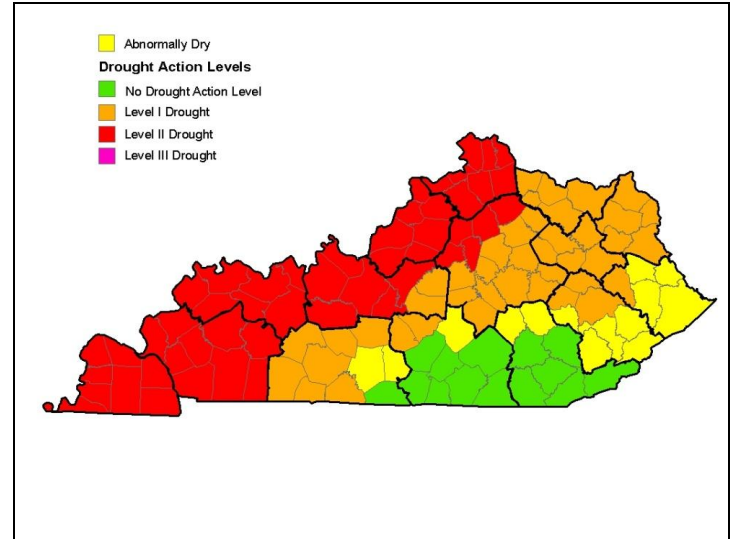
Drought

The spring of 2010 started out dry for the western and central parts of the Commonwealth. The U.S. Drought Monitor placed portions of western Kentucky under a D0 (slightly dry rating) in early March that slowly drifted east into the Bluegrass, where a D1 drought developed in late April for the western Bluegrass. The heavy rains from the May 1 event eliminated any drought-like conditions from the state. Unfortunately, the dry conditions quickly returned. Drought conditions reappeared in western Kentucky in the beginning of July 2010 and quickly intensified and spread eastward.

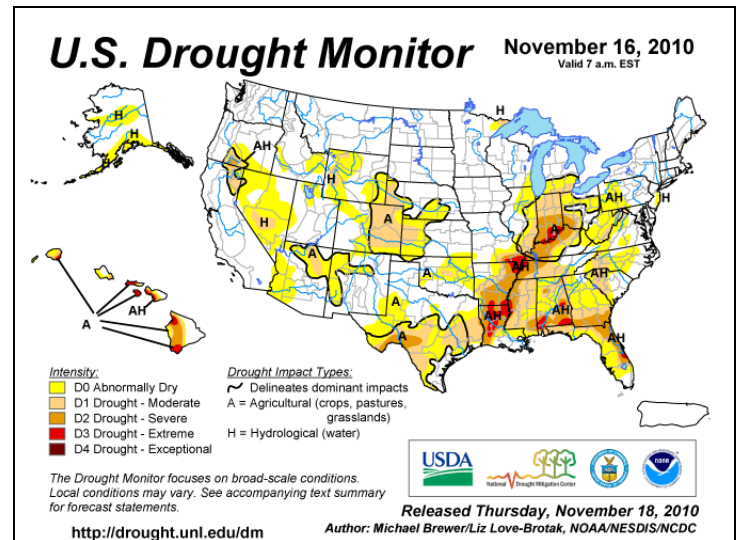
By early September, drought conditions were present in Western Kentucky and along the Ohio River up to the Northern Kentucky Area. Drought conditions then spread southward into the Bluegrass and conditions along the Ohio River worsened to severe and even extreme drought. The figures to the right show the extent of the drought conditions reached in late October and November before rains finally returned around Thanksgiving.

On Oct. 28, 2010, 92 counties were under a Level 1 or Level 2 drought declaration. The largest impacts from the drought were felt by agriculture. Crops, pasture and livestock were all adversely affected by the lack of water. The dry conditions also made for an early and more intense fire season. From Aug. 1 to Oct. 24, 2010, 497 reported fires burned 9,197 acres. During the same time period in 2009, only 10 reported fires burned 13 acres. One firefighter was killed fighting a wildfire in Livingston County. Luckily, water supplies were not significantly affected by the drought. The only issue worth noting was in the City of Marion, where the city's main supply lake, Lake George, suffered from the drought combined with limited refill during the

proceeding winter. The lake did not reach critically low levels, however and recovered after several large rain events in the early spring of 2011.



Drought declarations at the worst point on Oct. 28, 2010.



U.S. Drought Monitor at the worst point for Kentucky on Nov. 18, 2010.

Wellhead Protection Plan Program

Wellhead protection plans are designed to prevent groundwater contamination by management of potential contaminant sources within a designated land area around a well or spring. The plan requirements vary for public water systems based on their classification as transient non-community, non-transient non-community or community.

The primary goal of Kentucky’s Wellhead Protection Program (WHPP) is to prevent future occurrences of groundwater contamination through public education, careful planning and effective management of potential pollutants within wellhead protection areas. Kentucky’s WHPP was originally approved by USEPA in 1993, with modifications approved in 2001, and is coordinated by DOW under the Water Supply Planning Regulation KAR 401 4:220.

There are currently 132 active public water systems using groundwater sources: 80 community, 34 non-transient/community and 18 non-transient/non-community. WHPP is working on updates of over 50 wellhead protection plans that are due for five-year updates, including delineating new wellhead protection areas (WHPAs) for systems with new wells. Other WHPAs are being re-delineated using new information and delineation methods and the new data is being entered into the GIS system.

Wellhead protection planning activities FY 2011			
	Phase I	Phase II	5-Year
Reviewed	5	2	14
Approved	3	0	7
Developed	3	3	23

WHPP personnel made 27 site visits, which resulted in the development of 23 five-year updates and four Phase I and two Phase II plans.

Nonpoint Source and Basin Team Section

The Nonpoint Source and Basin Team Section consists of three distinct DOW programs that work closely together toward the goals of educating the public about water quality issues and providing them with the technical and financial assistance to form watershed groups that can implement on-the-ground Best Management Practices to improve water quality.

Nonpoint Source Pollution Control Program

The NPS Pollution Control Program consists of four project Technical Advisors (TAs) who possess a high level of expertise in one or more of the following nonpoint source pollution sources: agriculture, forestry, on-site wastewater, environmental education, urban stormwater and construction, riparian and stream restoration, and sediment. NPS TAs utilize this expertise to provide technical assistance and oversight to NPS pollution control projects as well as engage other governmental and non-governmental organizations who play a role in Kentucky’s broader NPS pollution control program.

NPS Pollution Control Grant [CWA Section 319(h)]

[2010 Grant Award and sub-grantee project selection](#)

The DOW received the FFY 2010 Nonpoint Source Pollution Control Grant Award in the amount of \$3.3 million to implement Kentucky’s program. The

division then awarded \$2.2 million to nine sub-grantee project contractors to implement statewide and regional water education projects, as well as development or implementation of watershed plans within five of the seven basin management units. A tenth project was funded through the re-obligation of funding from the 2007 grant year. All ten projects have executed contracts and have begun work. \$112,600 was allocated to the Kentucky Division of Conservation for personnel to provide technical assistance and oversight on sub-grantee projects with a focus on agricultural issues.

[2003 and 2004 Grant Closeout](#)

NPS program staff worked closely with the Grants Management Section to close out sub-grantee projects in both the 2003 and 2004 grant years prior to the closure dates. Thirty of the 33 projects were closed by their respective grant closure dates.

[Watershed Planning](#)

NPS program staff continue to provide technical assistance to watershed groups for the development of 12 watershed plans. NPS program staff conducted reviews of four draft watershed plans during SFY 2011 and were able to accept two for implementation (Bacon and Hinkston Creek watershed plans located in Hart and Montgomery counties, respectively). Watershed plan reviews continue to be coordinated through the Kentucky Inter-branch Watershed Implementation Workgroup (KIWIW), which provides the opportunity for all KDOW branches to comment or offer constructive feedback on watershed plans prior to acceptance. Currently, 13 watershed plans have been accepted for full or partial implementation with CWA Section 319(h) funding.

Five years of work by staff with the NPS program staff and Kentucky Waterways Alliance culminated in late 2010 with the publication of a Kentucky-specific guidance document for watershed plan development. The *Watershed Planning Guidebook for Kentucky Communities* was finalized, printed and issued to all watershed groups either currently engaged in or planning to begin a watershed planning project. The guidebook provides general watershed education information in addition to a step-by-step process watershed groups can follow to develop a plan that will meet the division's minimum requirements for implementation funding.

River Basin Team Coordination Program

The River Basin Team Coordination (RBTC) program consists of four personnel: the Green/Tradewater and Licking River basin coordinators (BCs) are KDOW employees, the Four Rivers BC position is filled through a contract with the Jackson Purchase Foundation, and the Kentucky River BC position is maintained by the University of Kentucky's Water Resources Research Institute.

Basin coordinators possess a unique skill set that is a blend of highly competent scientific knowledge paired with excellent communication skills. They are an integral component in both the Nonpoint Source Pollution Control and Water Watch/Watershed Watch programs. The goal of the RBTC program is to engage citizens and local governments, along with other interested agencies and entities, in education activities and projects that have a positive impact on water quality in their watershed. The BCs provide a unique interface between DOW and the public that enhances communication, understanding and cooperation in addressing watershed issues and meeting the goals of the Clean Water Act.

Outreach

The river basin coordinators continue to implement DOW's involvement with watershed management and cooperating agencies, local governments and citizens across the state. This involvement takes place through participation in basin team meetings, watershed groups' organizational and planning meetings, various citizen groups' activities and efforts, as well as other watershed-related events. This year the Green River and Four Rivers basin coordinators invested extensive time with the basin teams and led the watershed re-prioritization efforts in those basins. Updates were made to the division's priority watersheds list and GIS coverage based upon this work.

Basin coordinators in the Green/Tradewater, Four Rivers, Kentucky and Licking river basins held a total of 15 river basin team meetings. The basin team meetings are a KDOW-sponsored forum for bringing together local citizens, nongovernmental organizations and KDOW staff to discuss water issues in their respective river basins. These meetings, along with additional work by the basin coordinators, account for a great deal of the watershed group formation and momentum toward action on water quality issues in the state.

Education

The basin coordinators continue to provide education on watershed-related topics to a variety of audiences. During SFY 2011, BCs have conducted and participated in rain barrel and rain garden workshops and school environmental field days. They have given presentations to conservation district annual meetings, local government and planning meetings, school groups and community groups. An ongoing series of successful rain barrel workshops has been undertaken by the Green River

BC in partnership with the Barren County Cooperative Extension Service, Western Kentucky University and the cities of Glasgow, Bowling Green and Campbellsville.

Water Watch and Watershed Watch Programs

The Division's Water Watch office is staffed by one employee who receives additional assistance from the basin coordinators, the NPS technical advisor for environmental education and other Watershed Management branch personnel. The program's goals are to facilitate volunteer water-quality monitoring in Kentucky and to educate the public about the quality of water in their communities. The ultimate goal is to capture local citizens' interest in water quality issues and empower them take action to improve water quality in their communities.



Leadership

The Big Sandy Watershed Watch (BSWW) group became non-operational within the past year. Water Watch Program personnel invested a great deal of time into working with the board of Watershed Watch in Kentucky and the remaining BSWW members to revitalize the group. Water Watch staff organized a series of meetings for the purpose of re-

starting the BSWW. Staff then contacted all current and former BSWW volunteers by telephone and mail to solicit their support for the group. Through this series of meetings, BSWW was able to elect a board of directors, organize both the spring and summer sampling events and are in the process of planning a BSWW conference. The work is ongoing, but Water Watch staff believes that the group will be able to function without assistance by late 2011.



[Volunteer Monitoring](#)

Division Watershed Watch staff and basin coordinators heavily participated in providing training to 1,100 volunteer samplers prior to the 2011 sampling season. Division staff conducted Water Watch sample collection training at each of the eight basins' Watershed Watch conferences and conducted training events for volunteers. The Watershed Watch groups participate in three sampling events per year, each occurring in the spring, summer and fall. Division personnel also participated in multiple working roles for the Watershed Watch groups, including sampler, sample runner, event coordinator and trainer.

[Watch Standard Operating Procedures](#)

Program staff have been working to revise numerous outdated Watershed Watch SOPs and sampling protocols. The biological assessment protocol was completed during SFY 2011. The habitat assessment, grab sample and field chemistry protocol updates will be complete by March 2012. Kentucky's 1,100 Watershed Watch citizen volunteers will be taught these updated protocols prior to the 2012 monitoring season.

Watershed Planning Efforts Lead to Water Quality Improvements

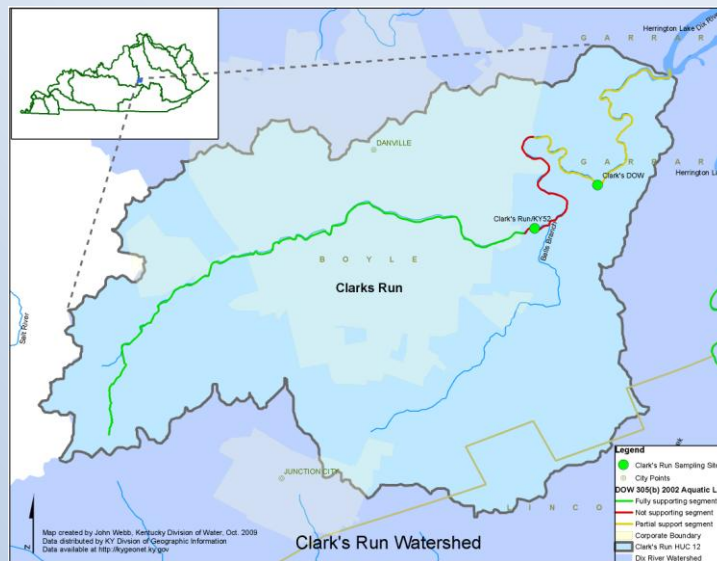
Waterbody Improved

Clark's Run of the Dix River is a headwaters stream in the Bluegrass Region of Kentucky that flows through the city of Danville. Clark's Run has had excessively high levels of nutrients, which increased as the stream flows through Danville. Stakeholders from the Dix River area formed the Clark's Run Watershed Council to discuss and coordinate implementation of management measures aimed at reducing nutrient impacts on water quality. As a result of management measures in the watershed, one segment of Clark's Run previously identified as impaired has been assessed to support its designated use for aquatic life. A Total Maximum Daily Load (TMDL) assessment for nutrients is currently underway for Clark's Run.

Problem

Clark's Run flows for approximately 12 miles from its headwaters to the Dix River and has 53 miles of streams including tributaries and main stem within the entire watershed. The Clark's Run watershed covers approximately 28.5 square miles or 18,219 acres in southeastern portion of Boyle (96.5 percent) and a small portion of Lincoln County (3.5 percent), Kentucky. About two-thirds of the City of Danville is located in the watershed as well as the northern part of Junction City. The Clarks Run Watershed is a tributary to the Dix River, which flows into Herrington Lake, a major recreational area in Central Kentucky. Lancaster is located east of the watershed, Perryville to the west, and Harrodsburg and Burgin to the north.

As part of a study begun in 1994, Clark's Run was targeted for monitoring to determine nutrient inputs into Herrington Lake, which was impaired for its aquatic life use due to low dissolved oxygen levels and repeated fish kills. In 1995, the Kentucky Division of Water performed several biological assessments of Clark's Run and determined the stream to be impaired for its aquatic life use designation. Impaired segments include stream mile zero to 4.3 (partial support for aquatic life use) and stream mile 4.3 to 6.6 (nonsupport for aquatic life use). The causes were thought to be nutrient eutrophication, organic enrichment and other unknown causes. Sources thought to be contributing to the impairment include urban runoff and storm sewers, municipal point source discharges and other unknown sources.



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Project Highlights

To address water quality impairments, watershed stakeholders initially convened in May 2006 to form part of the Dix River Watershed Council and work on the Dix River Watershed Plan. From this larger Council, the Clark's Run Focus Group was formed to implement the watershed plan in Clark's Run, and will continue to do so in the future.

Partners in the Clark's Run watershed have focused on improving water quality in several ways. The Clark's Run Environmental and Educational Corporation (CREEC) formalized in 2005 to enhance water quality and educate residents in the watershed. CREEC conducted water monitoring, worked on streamside greenways system with interpretive trails and education facilities, conducted riparian reforestation efforts and assisted with educational outreach in the community.

CREEC partnered with the City of Danville's Stormwater Utility to help fulfill the city's stormwater requirements. Additionally, the stormwater utility created a user service fee, which generates funds for improvements to the stormwater system. The stormwater utility implemented portions of the watershed plan within the municipality to improve water quality.

The City of Danville recently adopted several ordinances that focus on the improvement of water quality by restricting activities that may negatively affect local streams. Danville adopted an erosion and sediment control ordinance "to protect property, prevent damage to the environment and promote the public welfare in Danville by guiding, regulating, and controlling the design, construction, and use of excavation, grading, and other similar activities which disturb or break the topsoil or result in the movement of soil." Danville also enacted an Illicit discharge ordinance to regulate nonstormwater discharges into the watershed. The wastewater treatment plant for the City of Danville was recently upgraded to include a new facultative lagoon, two new clarifiers, settling tanks and UV disinfection process.

In 1995, surveys of aquatic macroinvertebrates (Macroinvertebrate Biotic Index, MBI) and fishes (Kentucky Index of Biotic Integrity, KIBI) were conducted by DOW in two locations on Clarks Run (see map). In 2008, the DOW performed the same surveys on Clark's Run.

Results

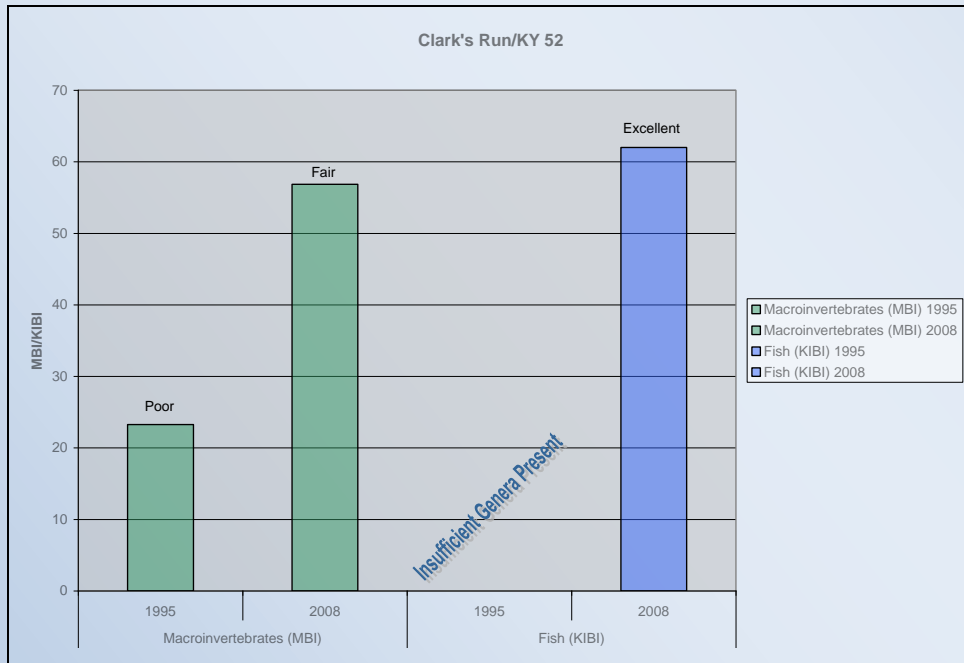
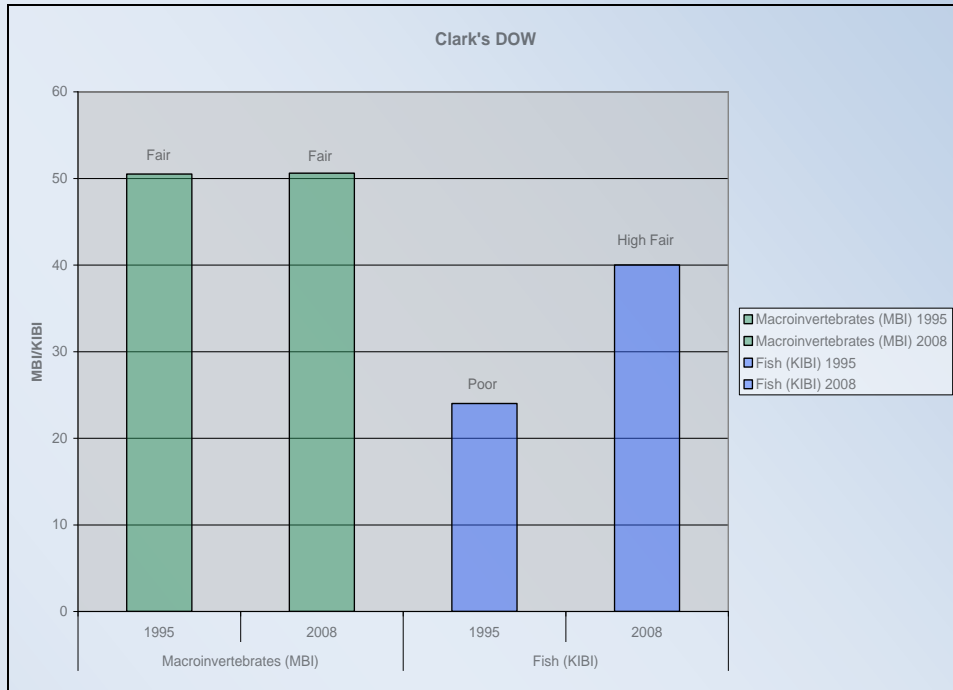
Because of the improvements at the Clark's Run/KY 52 site, Segment 2 was assessed in October 2009 to be fully supporting its aquatic life use designation. This represents a move from nonsupport to full support of the aquatic life use for this segment of Clark's Run. While the Clark's DOW site did not improve sufficiently to move out of the partial support category, one of the two (50 percent) impaired segments in the Clark's Run watershed now supports aquatic life use.

Partners

The collaborative effort of Clark's Run Focus Group members, representing state, local and federal agencies and local businesses, college faculty, groups, and landowners resulted in a watershed plan that has seen implementation lead to water quality improvements. For monitoring, assessment, planning and TMDL development, approximately \$409,700 has been spent in the entire Dix River Watershed, of which the Clark's Run Watershed comprises nearly seven percent of land area. The non-federal match generated by this project was around \$277,300.

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The WQB is responsible for collecting, analyzing and making scientific determinations on issues and activities that affect Kentucky's waterways. Water quality standards are the tools used to assess whether the quality of Kentucky's rivers and lakes are adequate for fish and other aquatic life, recreation, drinking, agriculture, industry and other uses. Activities in the WQB that protect waters in Kentucky are the Water Quality Certification program, the Wetlands Program, Exceptional Waters/Outstanding Resource Water designations and the Wild Rivers Program. Impaired waters are restored through the Total Maximum Daily Load Program.

The WQB has made great strides in communicating and collaborating with other DOW programs. WQB science and technical staff serve as technical advisors for issues related to KPDES permitting, spill response, sampling/training protocols, watershed-based planning and all issues related to aquatic sciences. WQB personnel participate on a host of technical and planning committees to further DOW's mission. WQB programs are more engaged than ever in public education and outreach initiatives related to highly complex programs, such as TMDLs and 401 Water Quality Certifications.

Nutrient pollution has become a national issue with very significant local impacts. The WQB has taken the lead in developing the first-ever Kentucky Nutrient Reduction Strategy (KNRS). As part of KNRS, the WQB is tasked with development of nutrient criteria targets for watershed-based plans and TMDLs as well as possible statewide nutrient numeric criteria.

Manager's Office

In SFY 2010, many issues came to the forefront of water quality management. These include:

- Kentucky Nutrient Reduction Strategy/Nutrient Criteria Development Plan revision
- Emerging issues: conductivity, selenium, mercury, microcontaminants, flow
- Inter/intra-agency coal monitoring workgroups, planning and evaluation
- Watershed-based-plan water-quality criteria target development
- TMDL water-quality criteria target development
- Antidegradation (401KAR 10: 029 and 030)
- TMDL Watershed Health Reports
- Operational planning
- Elements of a revision of the State Monitoring and Assessments Plan.
- Preparation of triennial review of Water Quality Standards
- 401/404/402/floodplains education outreach
- Development of TMDL plan of work
- Development of Water Quality Certification SOP decision matrix
- Development of assessments SOP
- Development of K-WADE data base

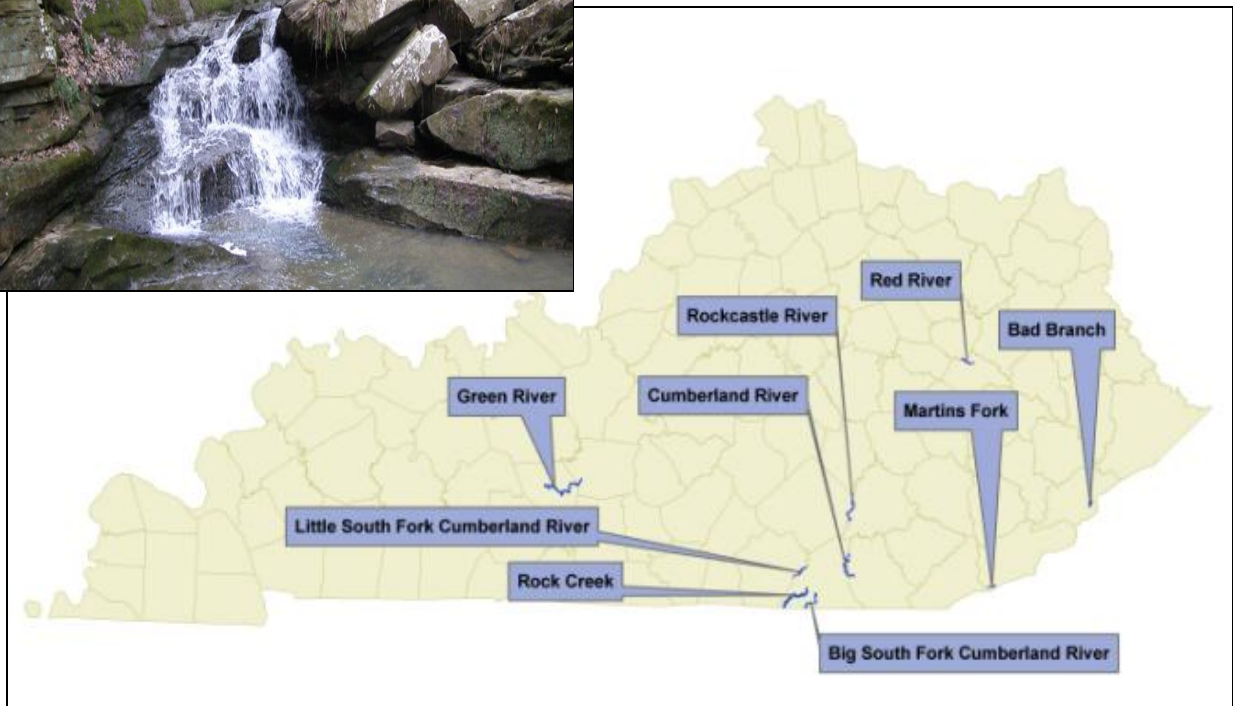
Wild Rivers

Portions of nine rivers of exceptional quality and aesthetic character have been designated as Kentucky Wild Rivers in accordance with KRS 146:200-360. Each Wild River is actually a linear corridor encompassing all visible land on each side of the river up to a distance of 2,000 feet. The nine Wild River corridors comprise a total of 114 river miles and 26,382 acres of land.

Since August 2009, the Wild Rivers Program has purchased or is purchasing an additional 1,800 acres of land (and seven miles of river frontage) throughout the Little South Fork and Green rivers. To date, the program has closed on a 60-acre tract on the Green River, with an additional four tracts totaling 1,600 acres scheduled to close by the end of 2011.

The Wild Rivers program continues to manage the approximately 2,600 acres currently owned by the program. Specifically, personnel began treating eastern hemlock trees on the Martins Fork State Natural Area infested with the non-native hemlock woolly adelgid. Thus far, nearly 1,000 infested hemlocks have been individually treated via ground injections of pesticide. Hemlock woolly adelgid treatment continued throughout the fall of 2011.

The Wild Rivers coordinator conducts quarterly water-quality monitoring at each Wild River in addition to periodic monitoring of high-traffic areas, and conducts an annual aerial land-use survey to track changes to land use and assess illegal activities.



Kentucky's Wild and Scenic Rivers

Quality Assurance

WQB made significant improvements in the area of quality assurance in SFY 2010. Most of the core SOP documents used by WQB were refined to improve clarity, incorporate more specific quality-assurance procedures and standardize formats for all procedures and across monitoring programs. SOPs were developed to address threatened and endangered species monitoring and assessment in cooperation with state and federal agencies. Assessment methodologies for OSRWs also underwent additional documentation.

A special work group was convened to address specific surface water quality issues. One of the issues discussed was data quality and the standard of quality to be used in DOW and outside data efforts. The initial group met to discuss ideas to develop ways and means to establish a division standard for documenting water quality monitoring data.

Standards and Assessments

Integrated Report

The 2010 Integrated Report (IR) on water quality was submitted to USEPA in August 2010 for approval of the 303(d) listed waterbodies and segments. This report fulfills requirements of sections 303(d), 305(b) and 314 of the Federal Water Pollution Control (or Clean Water) Act of 1972 (P.L. 92-500), as subsequently amended. Section 305(b) of the act requires states to assess and report water quality conditions to USEPA every two years.

The IR format provides designated-use categories to which monitored and assessed waterbodies are assigned. Designated uses are those beneficial uses that a given waterbody would reasonably be expected to support.

In Kentucky there are five primary designated uses and one state-defined designated use. Those uses are aquatic habitat (coldwater and warmwater aquatic habitat), primary contact recreation, secondary contact recreation and domestic water supply (potable water) and outstanding state resource water. Fish consumption is often referred to as a designated use, but it is not a use specifically defined in Kentucky regulations; however, it is considered a beneficial use and is strongly implied in water quality regulations, specifically 401 KAR 10:031 Section 2.

In addition to the default USEPA reporting categories, there are two state-defined categories, 2B and 5B. Category 2B provides tracking of waterbody segments that were found to fully support a previously listed non-supporting designated use (waterbodies in this category will be petitioned for delisting to USEPA). The application of Category 5B is to bring attention to those waterbody segments that can be assumed do not support a designated use based on evaluation of data. Those data used are primarily obtained from discharge monthly operating reports submitted to DOW by the permit holder. While these waterbodies do not require a TMDL, should in-stream monitored data be collected that indicate less than full support, that waterbody will move to the 303(d) list requiring a TMDL.

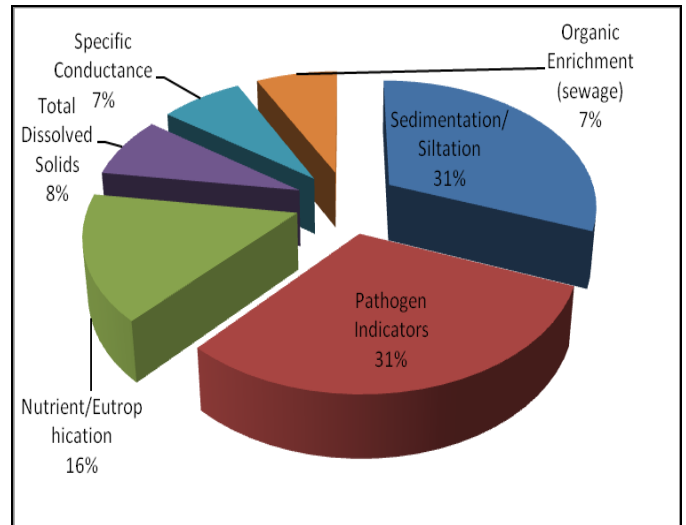
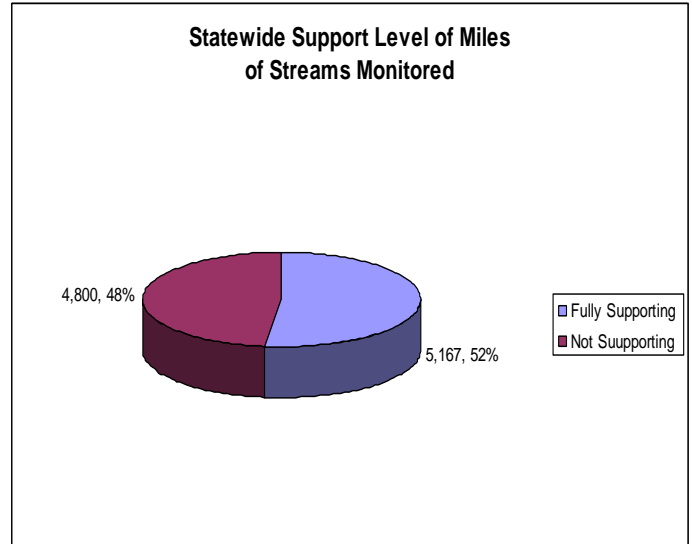
While the 2010 IR has yet to be approved, USEPA Region 4 staff notified DOW in August that the report was ready for final approval as submitted. The focus of this biennial report was on the Big Sandy–Little Sandy–Tygarts basin management unit (BMU) and the Kentucky River BMU; additionally, a statewide update was made to the report. Some highlighted statistics from this latest report follow.

**Warmwater and Coldwater
Aquatic Habitat Use Support -- Streams**

Kentucky has almost 92,000 miles of streams. Many of these are small first- and second-order intermittent or perennial streams to the great rivers of the Ohio and Mississippi. To date, DOW has assessed 9,967 miles (about 11 percent) of the Commonwealth’s streams for coldwater and warmwater aquatic habitat designated uses (collectively referred to as “aquatic life use”). Of the assessed miles, 5,167 (nearly 52 percent) fully support this designated use.

The number of assessed miles not supporting these designated uses is approximately 4,800 or 48 percent. Since the production of the 2008 IR, the number of miles not supporting aquatic life use has increased about one percent statewide.

The three leading pollutant causes of impaired water quality for this designated use are sedimentation/siltation, nutrient/eutrophication and total dissolved solids.





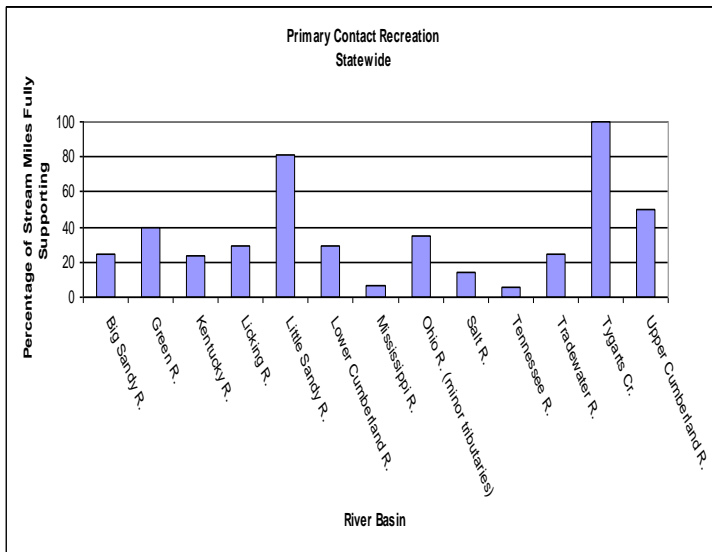
Primary Contact Recreation Use Support -- Streams

Primary contact recreation (PCR) criteria are in place to protect people recreating in a way that likely will result in full body immersion, such as swimming. Both bacteria and pH criteria apply to this designated use. In this report 4,762 miles have been assessed statewide for this use. A total of 1,494 miles (31 percent) fully support and 3,268 miles (69 percent) do not support the use. In comparison with results in the 2008 IR, 4,493 miles were assessed and 1,346 miles (30 percent) fully supported the use and 3,148 miles (70 percent) do not fully support. Current findings indicate little change in percentage of support level between the two report cycles, while assessed miles have increased nearly 270 stream miles in the 2010 cycle.

aquatic life use. Nearly 8,560 acres (four percent) do not support. The top three pollutants in this use are nutrient/eutrophication, pH and dissolved oxygen. These results are comparable to the support level reported in the 2008 IR that showed the same percentage (96 percent) of assessed lake acreage supporting this use. Since the 2008 IR cycle, the number of assessed acreage increased by approximately 9,000 acres.

Domestic Drinking Water Supply

All stream miles fully support domestic drinking water supply use. Where this designated use has been implemented, an associated 689.5 stream miles have been assessed.



About 218,000 acres (98 percent) of publicly owned acres of reservoirs, lakes and ponds (hereafter referred to as lakes) have been assessed for at least one designated use, primarily aquatic life. Of the 220,005 acres of publicly owned lakes assessed for this use, 211,448 acres (96 percent) fully support

Fish Consumption



Fish consumption is not a designated use in Kentucky water quality standards, but the use is implied in 401 KAR 10:031 Section 2 and through human health criteria in Section 6. Of the 1,210 miles that have been assessed for fish consumption, 754 miles (62 percent) fully support. Not supporting are 456 miles (38 percent), primarily due to mercury in fish tissue. In the 2008 IR, there were 1,245 stream miles reported as assessed, with 805 of those miles (65 percent) fully supporting fish consumption and 440 miles (35 percent) not supporting fish consumption. With nearly as many miles assessed between the two reports, the data indicate approximately the same level of support.

A statewide fish consumption advisory issued April 11, 2000, remains in effect due to low levels of mercury found in fish statewide.

Triennial Review of Water Quality Standards

Section 303(c) of the Federal Pollution Control Act of 1972 requires states to review, adopt or develop and revise their water quality standards every three years. The upcoming triennial review informally began in mid-2010 with the development of topics and revisions that would be put forward in the 2012 triennial review. Most of this effort will center on updating criteria to reflect current national criteria.

Updates to special waters categories found in 401 KAR 10:030 will occur with the proposal to adopt nine waterbodies into the Exceptional Waters category. This category, along with Reference Reach category, is often referred to as Tier 2.5 waterbodies. Tier 2.5 waterbodies or segments are those waters that have water quality properties (this includes physical habitat) that exceed the minimum criteria necessary to support the coldwater or warmwater aquatic habitat designated uses.

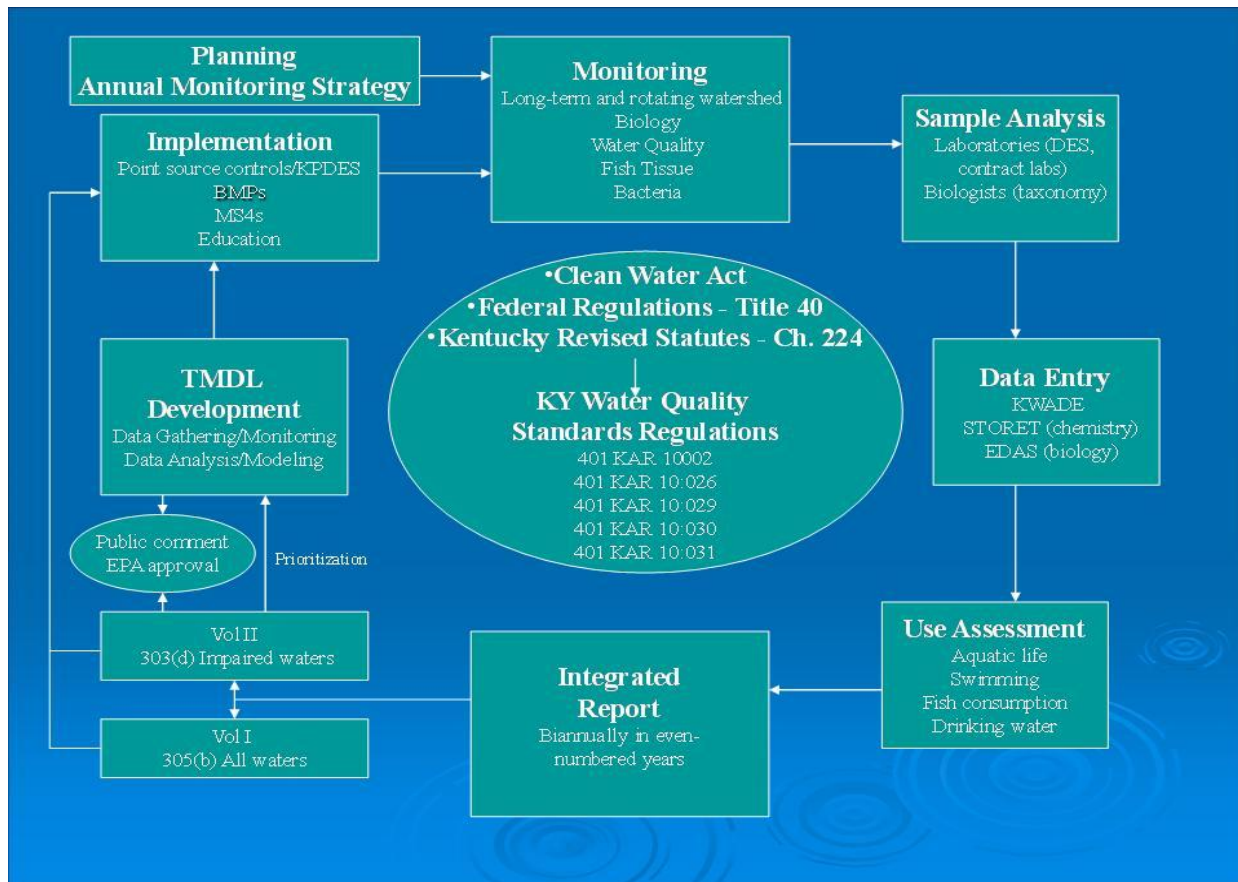
In the last triennial review, all waterbodies and segments listed in the Exceptional and Reference Reach categories were proposed for designation as Outstanding State Resource Waters (OSRW), as implemented in 401 KAR 10:031 and designated in 401 KAR 10:026. That effort was successful and those waters now have the added protection that comes with the designated use (OSRW) as opposed to only a categorical listing. That portion of the Clarks River that flows through the Clarks River National Wildlife Refuge will be proposed for inclusion in the Outstanding National Resource Water (ONRW) category.

The ONRW category is found under the antidegradation procedures in 401 KAR 10:03, and is often referred to as a Tier 3 waterbody. The ONRW category offers the highest protection against degradation of water quality and habitat in states' water quality regulations.

Each year, DOW/WQB manages and reviews biological and physicochemical data collected from the various monitoring programs. This effort follows DOW rotation through basin management units (BMUs); however, data from other BMUs are considered for assessment as needed and available. During odd-numbered years, 305(b) assessments are made and an electronic update of these assessment results is provided to USEPA. Under the Clean Water Act (Section 305[b]), states are required to submit a written report in even-numbered years that informs Congress on the condition of its water resources. This comprises Volume I of the Integrated Report.

Monitoring

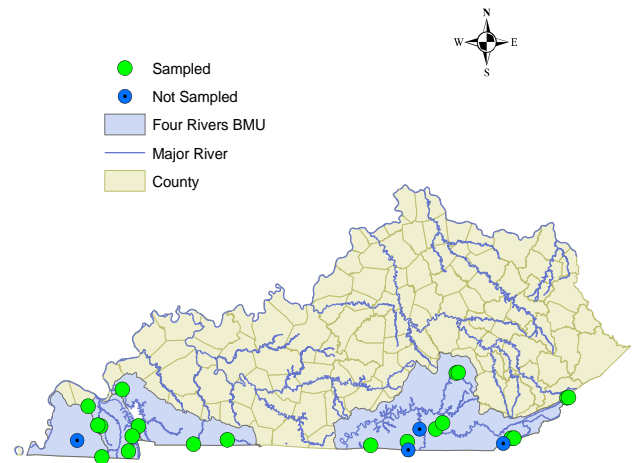
The assessment of water resources under Section 305(b) has broad-reaching implications as it sets the course on how the division implements many of its programs and provides a foundation to report on water quality trends under appropriate monitoring programs. An annual monitoring strategy is developed and implemented throughout the year. In CY 2010, staff focused on the Cumberland and Four Rivers BMUs. The structure and process for the monitoring programs is illustrated on the following page.



Reference Reach Monitoring

Reference Reach (RR) stations represent the “least-impacted” stream segments within geographical regions of Kentucky. These stream segments have high biological integrity and are used to develop biological criteria to assess aquatic life use. In 2010, the Monitoring Section planned to collect fish community, macroinvertebrate community, diatom community, habitat and chemistry data from 24 of the 75 RR streams within the Four Rivers BMU. Of the 24 RR stream sampling stations, sampling at 19 stations was completed. An intensive survey on Brownies Creek in Bell and Harlan counties, including two RR monitoring stations, was also completed. A planned intensive survey on Fuggitt Creek in Harlan County could not be completed due to turbid conditions throughout the index period. Ten RR monitoring stations overlapped with the Ambient Water Quality Monitoring network or

Wild Rivers Program and were visited bimonthly or quarterly, respectively, for water sampling under those programs. Five additional Reference Reach monitoring stations were sampled on the same schedules to increase the number of seasonally sampled stations in the BMU.



Ambient Water Chemistry

Water chemistry data are collected from an ambient network of stations. These data are used to determine trends and assess aquatic life use. From April 2010 through March 2011, water chemistry samples were collected from 25 ambient and rotating stations in the Cumberland/Four Rivers watersheds on a monthly basis. Also collected every other month were 19 central Kentucky sites found in the Kentucky, Green, Salt and Licking River basins.

Starting in April 2011, the BMU cycle changed to the Green River watershed. Forty-six ambient and rotating stations within this watershed were sampled monthly as well as 54 non-BMU ambient stations located across the state. This sampling will continue through March 2012.

In addition to water chemistry, chlorophyll *a* data were collected at a selected set of 30 ambient sites starting in April 2011. Chlorophyll *a* monitoring will continue through the primary growing season (July through October). These data will be used to assist in the development of nutrient criteria for large rivers (streams and rivers greater than 200 square miles).

Probabilistic Water Quality Monitoring

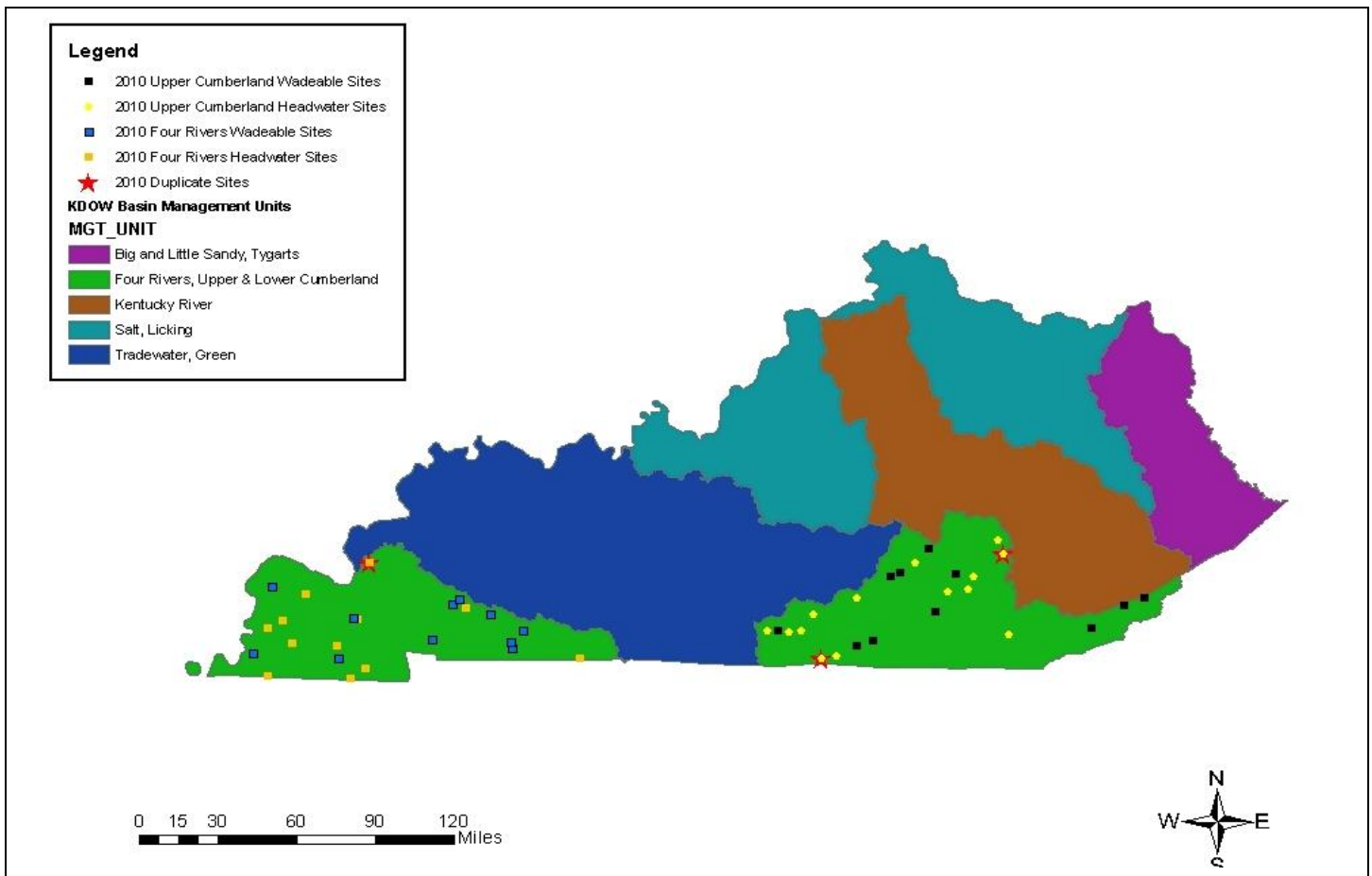
Probabilistic monitoring program personnel collect macroinvertebrate and fish community, habitat and chemistry data from a set of probabilistically selected sites within the targeted basin management unit of the year. Data collected via this program are used to assess aquatic life use throughout the watershed.

Sampling in 2010 was conducted in the Four Rivers and Upper Cumberland River BMUs. Site assessments were conducted from the beginning of March through late September in compliance with established index periods for biological assessment of fish and macroinvertebrate communities. Sampling was conducted for headwater sites of less than five square miles in the spring (March-May) and for wadeable sites of five to 200 square miles from early June until late September.

Of the 50 targeted sites selected for probabilistic monitoring in 2010, 48 were sampled. Twenty-six of these sites were headwater sites with 14 headwater sites occurring in the Upper Cumberland BMU and 12 occurring in the Four Rivers BMU. The remaining sites were classified as wadeable streams; 11 were located in the Four Rivers BMU and 11 in the Upper Cumberland. In addition, three sites were sampled as duplicates for Quality Assurance purposes. Sites not sampled were attributed to inaccessibility or inclement weather.

Probabilistic Fish Tissue Monitoring

This year was slated for the continuation of the probabilistic approach to fish tissue sampling. Forty lakes statewide were sampled in 2009 and 40 more were scheduled for 2010. Several factors interfered with the 2010 plan. Low flow resulting from severe drought combined with poor habitat in some areas led to an unsuccessful effort. After attempting to collect samples at one-fourth of the sites with no success, the effort was abandoned for the summer. DOW does plan to reinstate this sample plan with a different tactical approach, including the use of gill nets, a small boat electrofisher and a tote barge electrofisher.



2010 Probabilistic Survey Sites Sampled in Headwater and Wadeable Streams

Lake	County	Spring	Summer	Fall
Energy Lake	Trigg	X	X	X
Lake Blythe	Christian	X		
Cannon Creek Lake	Bell	X	X	X
Chenoa Lake	Bell	X	X	X
Corbin City Res.	Laurel	X	X	X
Cranks Creek Lake	Harlan	X	X	X
Hematite Lake	Trigg	X	X	
Honker Lake	Lyon	X	X	
Laurel Creek Lake	McCreary	X	X	X
Lake Linville	Rockcastle	X	X	X
Martins Fork Res.	Harlan	X	X	X
Lake Morris	Christian	X		
Metropolis Lake	McCracken	X	X	
Swan Pond	Ballard	X	X	X
Turner Lake	Ballard	X	X	X
Tyner Lake	Jackson	X	X	X
Wood Creek Lake	Laurel	X	X	X
Wood Creek Lake	Laurel	X	X	X
Lake Cumberland	Multiple Co's	X	X	X

Lakes sampled in 2010

Bacteriological Monitoring

Monitoring for pathogens in 2009 included *Escherichia coli* (*E. coli*) sampling in the Four Rivers BMU. Of the 14 stations established previously, five were removed due to being accessible only by boat; DOW fish sampling protocols and assessment tools apply to wadeable streams only. A tenth site was added to the remaining nine to establish a station within the Tennessee River Basin. All would be sampled for fish community and water chemistry.

Staff successfully collected fish community samples from eight of the ten stations. Staff reductions prevented collections during the late index period for the larger streams. Because four of the ten stations overlapped with the Ambient Water Quality Monitoring Network, they were visited bimonthly for water sampling under that program. Staff collected water samples at the remaining six stations, which were delivered to the lab at the Environmental Services Branch in Frankfort. There the samples were processed, analyzed and chemistry reports prepared.

Lake Monitoring

Water chemistry and chlorophyll *a* data were collected from lakes and reservoirs within the Upper Cumberland and Four Rivers BMUs. Nineteen lakes from the Upper Cumberland and Four Rivers basins were sampled in 2010. Due to severe drought, five of the 19 lakes were not sampled during all three index periods. All 19 were sampled in the spring. Seventeen lakes were sampled in the summer and 14 in the fall. Data from this program are being used to assist in the development of nutrient criteria for Kentucky's lakes and reservoirs. The data will be processed and assessment made for the next IR.

Large River Monitoring

Large river monitoring protocols were developed by USEPA; staff from Kentucky were trained in these protocols on large rivers in the state. An initial test of the protocols was accomplished with USEPA, and implementation of large river network sampling will occur in SFY 2011. Ten sampling locations on the Cumberland River above the falls have been chosen for this pilot project. Three attempts were made to sample these sites. However, inclement weather resulting in turbid and high water conditions in the Upper Cumberland Basin prevented sample collection. Ten sites have been selected in the Green/Tradewater BMU for sampling during the 2011 sample season.

Water Quality Certification

The Water Quality Certification (WQC) Section administers water certifications through the Clean Water Act Section 401 and coordinates special monitoring projects and grants relating to wetlands and mitigation projects. The certification actions of 401 involve coordination with the USACE Section 404 permit program. Both programs involve water quality certifications relating to mitigation measures when waters are proposed to be altered/affected from their natural functioning.

Clean Water Act Section 404 administered by the regulatory section of USACE – Permits for dredged or fill material.

Clean Water Act Section 401 administered by DOW provides state oversight of the federal 404 permitting program. DOW must issue a 401 Water Quality Certification for a 404 USACE permit to be valid.

Examples of activities that may require a Section 401 water quality certification:

- Dredging Activities
- Fill Activities
- Bridges/Culverts
- Alterations to stream channels including restoration.



Photo by Tom Biebighauser

Wetlands



Photo by Tom Biebighauser

The WQC Section is the lead agency for Kentucky in the 2011 USEPA National Wetland Condition Assessment. This nationwide study began in May, and Kentucky has sampled five of the 12 probabilistically-determined sites, most of which are located in the Four Rivers Basin in western Kentucky.

The WQC Section is developing an ambient wetland assessment program. Under the Clean Water Act, states are required to monitor and report on the quality of all their waters, including wetlands. Also, it is DOW's goal to move toward an increase in quantity and quality of wetlands in the state of Kentucky. The development of an ambient wetland monitoring and assessment program will establish a baseline of ambient wetland conditions, track trends and assist in the development of wetland water. The section is also working with DOW legal counsel and USACE Louisville to develop a joint deed restriction /conservation easement documents that will shorten the time it takes for applicants to receive both USACE permits and DOW certifications.

Activities

Action	Number
Issued individual certifications	129
Issued general certifications	582
Conducted site visits	422
Participated on interagency review team	monthly meetings



Rapid Assessment Targets Wetlands

The Water Quality Certification Section received a \$700,000 Wetland Program Development Grant in early 2010 to develop and biologically validate a rapid wetland assessment method specifically for Kentucky. This method is critically needed to assess the condition and functions of wetlands under the jurisdiction of the Section 404/401 permitting process. This regulatory tool will enable the USACE and the WQC Section to scientifically assess wetland impacts so they can be avoided, reduced and/or properly mitigated.

Researchers will use the method to evaluate potential dredge and fill impacts, assess mitigation and restoration success, assist in watershed planning and support the development of regulations protecting unique or high-quality wetlands. The focus will be on the primary wetland types found within the Lower Tennessee and Upper Cumberland regions.

A multi-agency technical advisory committee was formed in January; by May 2011 the group had produced a draft rapid wetland assessment method. Currently, Eastern Kentucky University is field testing the method in the Upper Cumberland Basin and will present their results to the technical advisory workgroup at their fall meeting.

Education / Outreach

Disaster Assistance and Relief Team (DART) members of the WQC Section are also serving as emergency responders to assist with NRCS and other agencies during emergency events that have impacts on Kentucky's waterways.

Total Maximum Daily Loads (TMDLs)

Reporting/303(d) Lists

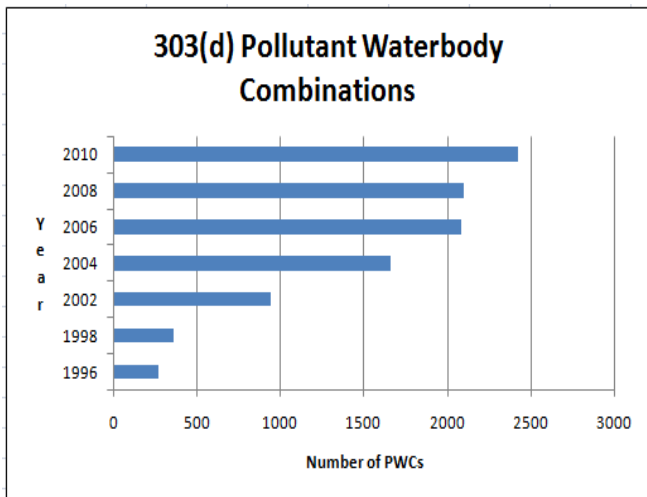
Requirements from Section 303(d) of the Clean Water Act include:

- Listing of impaired waters in the IR format
- Calculating total maximum daily loads (TMDLs) for each Pollutant/Waterbody Combination (PWC)
- Delisting impaired waters that have successfully shown improvement and meet designated uses

Kentucky has produced Water Quality Reports to Congress (305(b) reports) biennially since 1976 and electronic data submittals in odd years since 2001. Kentucky has produced 303(d) lists of impaired waters biennially since 1990 (except 2000). As of 2006, USEPA requires an IR that covers reporting requirements under Section 305(b) and 303(d); thus, DOW developed a two-volume IR for the 2006, 2008 and 2010 reporting cycles. The 305(b) portion of the report (Volume I) lists all water quality assessment results for surface waters (streams, springs, lakes, ponds and reservoirs) in Kentucky. The 303(d) portion of the report (Volume II) is a subset of those waters including all waters not supporting one or more designated uses and requiring the development of a TMDL. Volume II of the 2010 IR went to public notice in August 2010 and is awaiting USEPA approval.

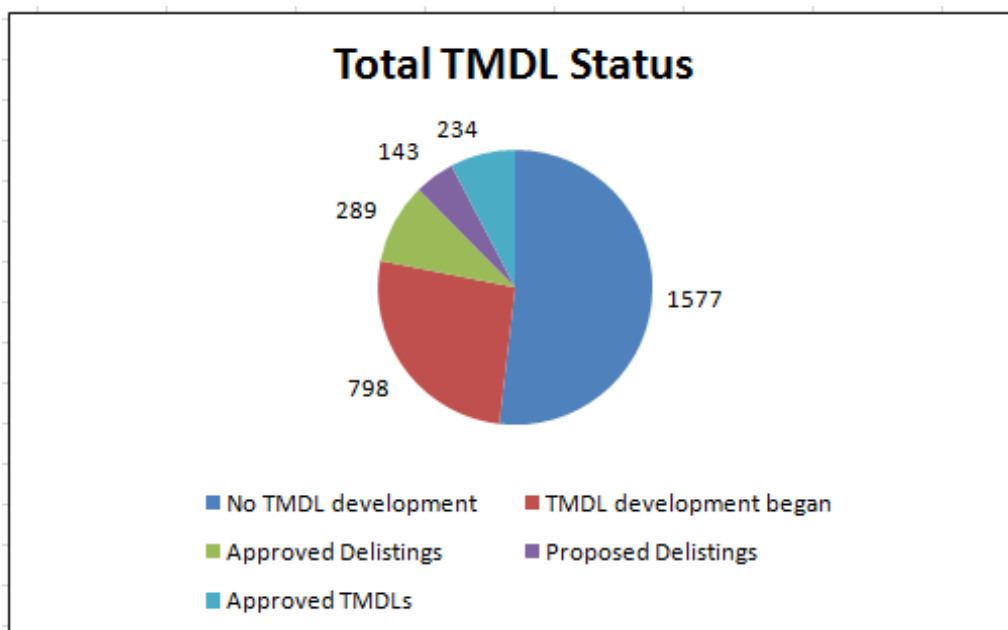
Assessed Waterbodies

As assessments of more streams have been performed over the years, the number of impaired waterbodies has increased proportionally. Volume II of the draft 2010 IR contains 2,422 pollutant/waterbody combinations (PWC). USEPA requires that each PWC have an approved TMDL within 13 to 15 years from the initial listing.

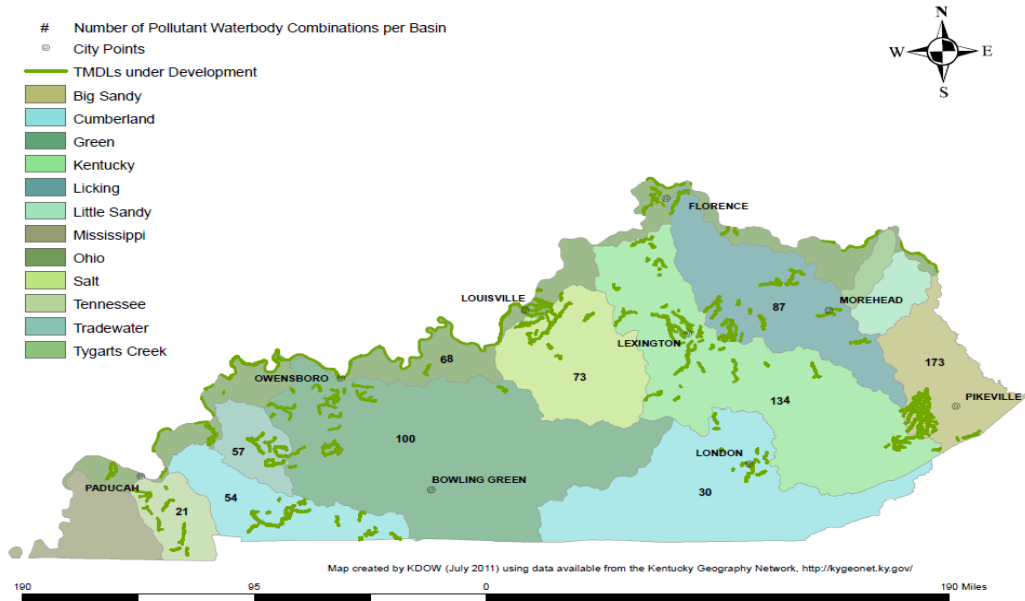


TMDL Development

Another requirement of Section 303(d) is that states must calculate TMDLs for impaired waterbodies on the 303(d) list. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can naturally assimilate and still maintain its designated use(s). Designated uses for Kentucky’s streams, springs, ponds and lakes include aquatic life uses, primary and secondary contact recreation uses (swimming, boating, etc.), drinking water and fish consumption (implied use). The TMDL calculation, usually expressed in units of mass/unit time, is also termed the loading capacity. A TMDL must be calculated for each pollutant impairing a lake, spring, pond or a specific reach of stream. There are over 600 PWCs for which a TMDL is currently under development. While DOW is responsible for submitting TMDLs to USEPA, many are being developed by third parties, including USEPA, universities, consultants and municipalities. TMDL development begins with the monitoring of the impaired stream segments.

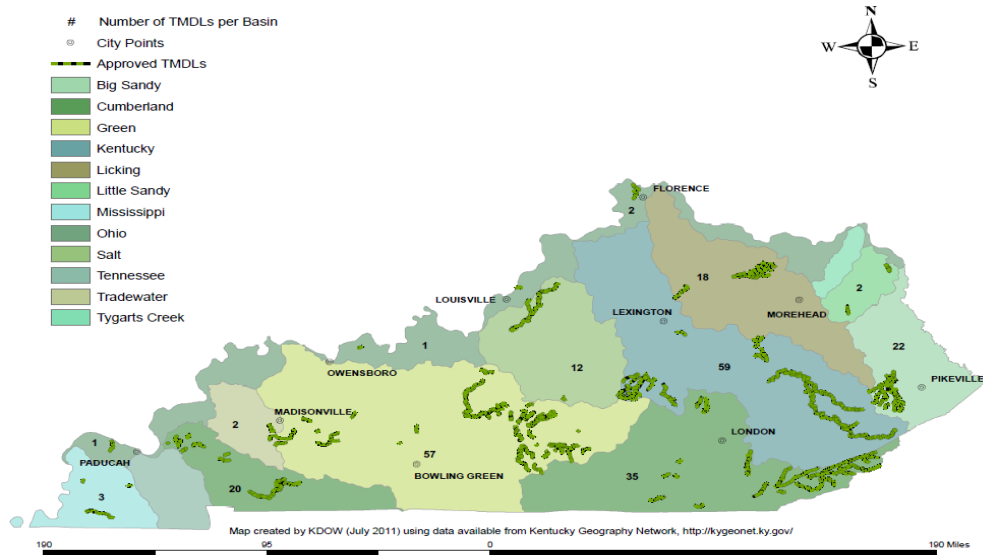


TMDLS Under Development



During FY2011, TMDL monitoring staff collected samples from 119 chemical, 12 biological and 137 bacteriological sites located within the ten watersheds. Most chemical sites are visited monthly for one year. Bacteriological sites are visited approximately ten times during the summer primary contact recreation season. Biological sites are visited once in the spring and once in the summer. For FY2011, the monitoring staff collected 1,427 chemical, 393 bacteriological and 12 biological samples.

Approved TMDLs



TMDLs are currently under development for approximately 800 PWCs. While DOW is responsible for submitting TMDLs to USEPA, many are being developed by third parties, including USEPA, universities and consultants. TMDL development begins with the monitoring of the impaired stream segments.

Monitoring

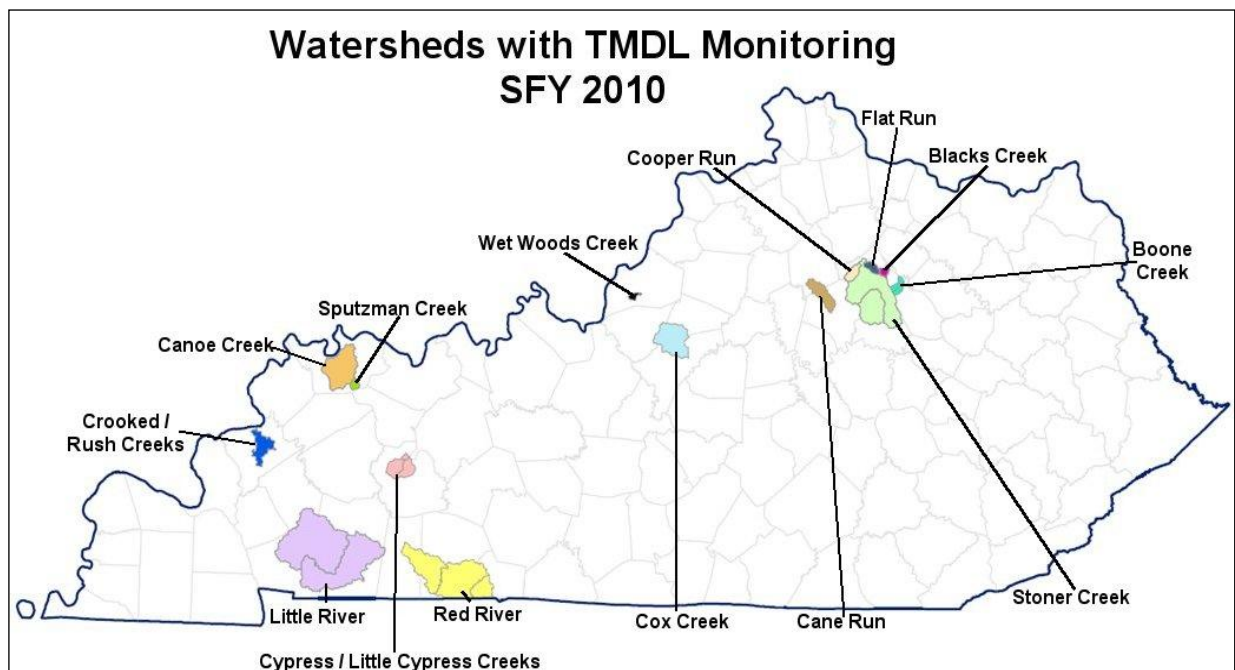
TMDL analysts utilize the data collected by the monitoring staff to calculate the TMDL for each pollutant/waterbody combination. Once the data are analyzed, a report is written to disseminate the findings. These TMDL reports must undergo internal DOW review (preliminary review), a 30-day public comment period (proposed review) and must be approved by USEPA (final review). The TMDL reports contain limits for both point and nonpoint sources of the pollutant such that a waterbody can be brought back to full support of its designated uses.

The TMDL Section had committed to USEPA to obtain approval for 35 TMDLs for FFY 2010, which ends Sept. 30, 2010. The TMDL Section has written and received formal USEPA approval for 25 pathogen TMDLs in the Dix River Watershed and one pH TMDL in the Cypress Creek watershed during SFY 2010. Twenty two pathogen TMDLs within the Beaver Creek Watershed went to preliminary review on June 30, 2010. The TMDL Section has committed to USEPA to obtain approval for 100 TMDLs for FFY 2011.

Delisting from 303(d)

There are two means by which a listing can be removed from Volume II of the Integrated Report: develop a TMDL or delist without TMDL development. Delistings only occur during a listing cycle year and only with USEPA approval. Delistings can be due to errors in the initial listing or to an improvement in water quality such that the water is no longer impaired for a specific pollutant.

As of 2011, USEPA has formally approved TMDLs for a total of 200 PWCs and USEPA has approved delisting requests for 234 PWCs. DOW is requesting delistings for 143 PWCs for 2010. If USEPA does not approve the delisting(s), it will be placed back on the 303(d) list.



Program Development

The TMDL Section is working with the U.S. Geological Survey to enhance the WATERS model tool, which is currently being utilized in the development of the North Elkhorn TMDL. A third party contractor is also using WATERS in the development of the Panther Creek/Long Falls TMDL. The model generates Load Duration Curves through a simplified process, which reduces the amount of time required for data analysis.

Education and Outreach

The TMDL Section is developing a watershed newsletter as public outreach. The newsletter will represent a report card of the water quality in each watershed where the TMDL Section conducts monitoring. In addition, the newsletter will contain information on how to improve the water quality in the particular watershed and will guide the public to additional assistance to help improve their watersheds.

The TMDL Section publishes pre- and post-monitoring reports that seek to educate people about

the Clean Water Act and relay scientific information. When a stream is selected for the TMDL development, the watershed is assessed to understand the potential sources of pollution and determine where the study sites will be located. This pre-monitoring process is described in the Initial Watershed Report. These reports describe why the watershed is being monitored, the locations of the impaired streams and the monitoring sites.

When the year-long study has been completed, the data is used to determine the current state of the watershed. This post-monitoring process is described in the watershed Health Report, a brochure that highlights not only where improvement is needed in the watershed, but also its strengths in hopes of protecting areas that are not yet impaired. The Health Report assigns grades of **A** through **F** for water quality and biological health based on numeric criteria or ecologically significant values. These grades are then averaged to achieve an overarching watershed grade to demonstrate the overall health of the system.

Watersheds with Watershed Health Reports or Initial Watershed Reports

Watershed Health Reports

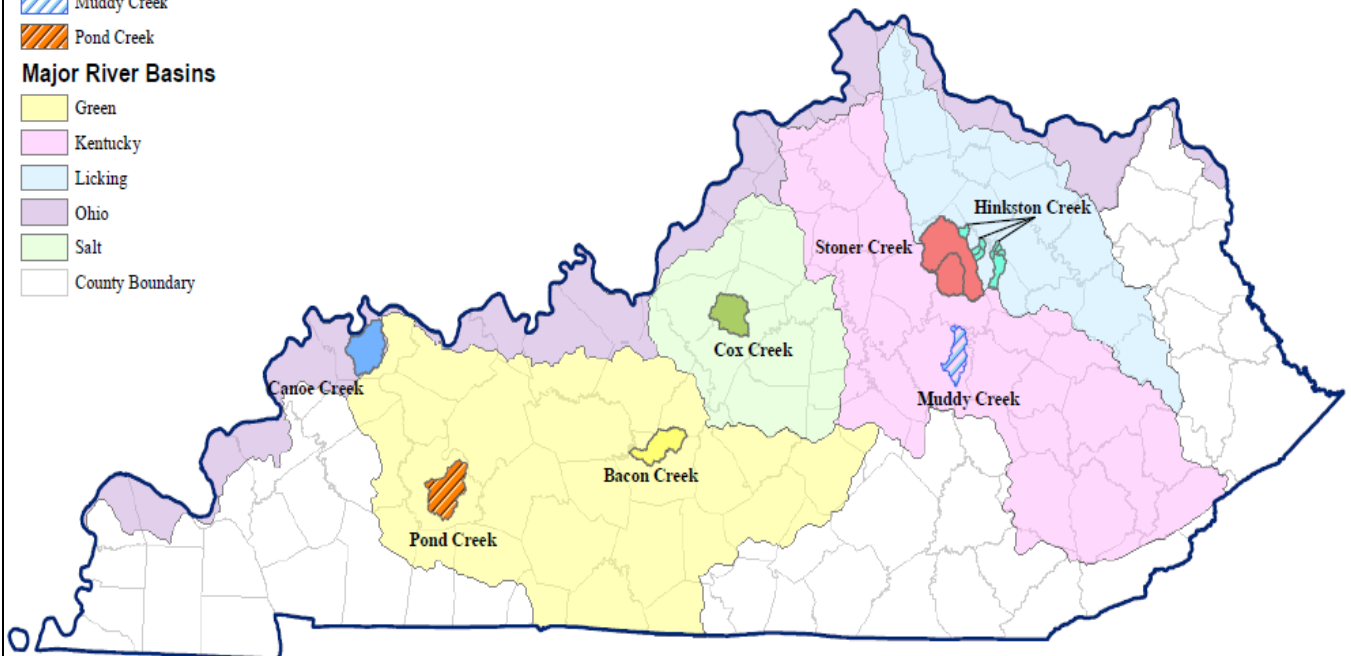
- Bacon Creek
- Hinkston Creek
- Cox Creek
- Canoe Creek
- Stoner Creek

Initial Watershed Reports

- Muddy Creek
- Pond Creek

Major River Basins

- Green
- Kentucky
- Licking
- Ohio
- Salt
- County Boundary



Find the reports here: <http://water.ky.gov/waterquality/Pages/TMDLHealthReports.aspx>

**Department for Environmental Protection
Division of Water**

Referral Directory

Accounts Payable.....	Water	4806	Linda Duncan
Accounts Receivable	Water	4806	Linda Duncan
Adopt a Stream	Water	4939	Jo Ann Palmer
Advisories, Swimming & Fish Consumption	Water	4962	Allison Fleck
Aerator Systems.....	Water	4893	William Shane
Algae Information.....	Water	4861	John Brumley
Ambient Groundwater Monitoring Data.....	Water	4926	Rob Blair
Ambient Water Monitoring Data	Water	4873	Rodney Pierce
Americans with Disabilities Officers (ADA).....	Water.....	4962.....	Allison Fleck
Animal Feeding Operations (AFOs).....	Water.....	4850.....	Jory Becker
.....	Water.....	4896.....	Ronnie Thompson
Animal Waste Facilities.....	Water.....	4896.....	Ronnie Thompson
Asbestos.....	Water.....	4988.....	Brian Chitti
Auto/Truck Facilities – Wastewater Permitting (KPDES)	Water.....	4954.....	Mahmoud Sartipi
Biomonitoring of Whole Effluents	Water.....	4881.....	Charles Clark
Biological Monitoring	Water.....	4873.....	Rodney Pierce
Boil Water Advisories	Water.....	4955.....	Sally Barclay
Bottled Water – Plan Review.....	Water.....	4958.....	Julie Roney
Budget.....	Water.....	4809.....	Tim Miller
.....	Water.....	4810.....	Ron Price
Car Wash – Wastewater Permitting (KPDES).....	Water.....	4954.....	Mahmoud Sartipi
Certification – Monitoring Well Drillers	Water.....	4940.....	Joe Moffitt
Certification – Water Well Drillers.....	Water.....	4940.....	Joe Moffitt
Certification – Wetlands (401)	Water.....	4855.....	Barbara Scott
Chemical Plants Permitting (KPDES)	Water.....	4924.....	Sara Beard
Coal Mining Facilities Permitting (KPDES)	Water.....	4853.....	Heather Dodds
.....	Water.....	4895.....	Larry Dusak
Combined Sewer Overflows (CSOs).....	Water.....	4852.....	Gary Levy
Commercial Discharge Permitting (KPDES)	Water.....	4924.....	Sara Beard
Complaints.....	Water.....	4955.....	Sally Barclay
Comprehensive Technical Assistance Program	Water.....	4958.....	Julie Roney
Computer (Hardware/Software).....	Water.....	4838.....	Melissa Miracle
Consumer Confidence Reports	Water.....	4987.....	Natalie Bruner
Corps of Engineers	Water.....	4855.....	Barbara Scott
Dams	Water.....	4595.....	Gary Wells
Dams – Inspections.....	Water.....	4992.....	Marilyn Thomas
Data Entry.....	Water.....	4580.....	Linda Baker
Data Management, Departmental	Water.....	564-2150.....	Dean Tomlinson
Office of Information Services (OIS)	EEC.....	5174	
Distilleries – Wastewater Permitting (KPDES)	Water.....	4901.....	Sarah Tucker
Discharge Monitoring Data (DMR).....	Water.....	4920.....	Cheryl Edwards
.....	Water.....	4916.....	Jerry Milburn

DMR – QA Program.....	Water.....	4891.....	Abigail Rains
Dredging.....	Water.....	4855.....	Barbara Scott
Drinking Water Compliance.....	Water.....	4959.....	Frank Hall
Drinking Water Regulations.....	Water.....	4808.....	Abigail Powell
Drinking Water Testing.....	Water.....	4959.....	Frank Hall
Drought.....	Water.....	4934.....	Bill Caldwell
Dye Tracing.....	Water.....	4926.....	Rob Blair
Ecological Support.....	Water.....	4873.....	Rodney Pierce
Education Coordinators.....	Water.....	4962.....	Allison Fleck
Environmental Watch.....	Water.....	4939.....	Jo Ann Palmer
Adopt A Stream.....	Water.....	4939.....	Jo Ann Palmer
Environmental Watch Hot Line.....	Water.....	800-928-2380	
Equal Employment Opportunity Counselors.....	Water.....	4962.....	Allison Fleck
401 Certification.....	Water.....	4855.....	Barbara Scott
Facility File (KPDES).....	Water - KPDES.....	4575.....	Mike Reed
.....	Water - KPDES.....	4570.....	Jeff Robinson
Facilities Plan.....	Water.....	4912.....	Jill Bertelson
Federal Emergency Management Agency (FEMA).....	Water.....	4906.....	Chris Hart
Federal Grants / Budget (see also Grants / Budgets).....	Water.....	4809.....	Tim Miller
.....	Water.....	4810.....	Ron Price
FEMA Map Modernization Program.....	Water.....	4928.....	Carey Johnson
Field Offices, DEP.....	Water.....	4957.....	Tom Gabbard
.....	Bowling Green.....	270-746-7475.....	Air, Waste, Water
.....	Columbia.....	270-384-4734.....	Water
.....	Florence.....	859-525-4923.....	Air, Waste, Water
.....	Frankfort.....	564-3358.....	Air, Waste, Water
.....	Hazard.....	606-435-6022.....	Air, Waste, Water
.....	London.....	606-330-2080.....	Air, Waste, Water
.....	Louisville.....	502-429-7122.....	Water
.....	Madisonville.....	270-824-7529.....	Water
.....	Morehead.....	606-783-8655.....	Waste, Water
.....	Paducah.....	270-898-8468.....	Air, Water
File Rooms			
.....	Water - KPDES.....	4575.....	Mike Reed
.....	Water - KPDES.....	4570.....	Jeff Robinson
.....	Drinking Water.....	4579.....	Judy Ward
Fish Tissue.....	Water.....	4859.....	Eric Eisiminger
Flood Insurance Program.....	Water.....	4906.....	Chris Hart
Floodplain Enforcement.....	Enforcement.....	290.....	Jeff Cummins
Floodplain and Dam Complaints.....	Water.....	4992.....	Marilyn Thomas
Floodplain Construction.....	Water.....	4902.....	Todd Powers
.....	Water.....	4888.....	Kate Carigan
Floodplain Maps.....	Water.....	4928.....	Carey Johnson
Floodplain Permits.....	Water.....	4902.....	Todd Powers
.....	Water.....	4888.....	Kate Carigan
Gas and Oil.....	Water.....	4894.....	Dan Juett
.....	Water.....	4901.....	Diana Davidson
GIS.....	Water.....	4945.....	Susan Cohn
.....	Water.....	4949.....	Jim Seay
Grants/Budget			
Water – Grants.....	Water.....	4810.....	Ron Price
Groundwater Contamination.....	Water.....	4932.....	David Jackson
Groundwater Database.....	Water.....	4931.....	Jo Blanset
Groundwater Educational Material.....	Water.....	4947.....	Pat Keefe
Groundwater Monitoring.....	Water.....	4932.....	David Jackson
.....	Water.....	4926.....	Rob Blair

Groundwater Protection Plans	Water	4947.....	Pat Keefe
Groundwater Regulations	Water	4932.....	David Jackson
Groundwater Remediation – Wastewater Permitting (KPDES)	Water	4954.....	Mahmoud Sartipi
Groundwater Sensitivity Vulnerability	Water	4932.....	David Jackson
Groundwater Technical Support	Water	4932.....	David Jackson
Groundwater Water Withdrawal Permit	Water	4933.....	Chris Yeary
Hydrogeology	Water	4948.....	Phil O’Dell
Industrial Wastewater Permitting (KPDES)	Water	4924.....	Sara Beard
Inventory (State-Owned Property).....	Water	4806.....	Linda Duncan
Inventory Data Sheet (Drinking Water).....	Water	4981.....	Todd Ritter
Karst Investigations	Water	4948.....	Phil O’Dell
KPDES Program.....	Water	4850.....	Jory Becker
KPDES, Groundwater, Dye Tracing.....	Water	4932.....	David Jackson
.....	Water	4926.....	Rob Blair
KPDES, Permit Application Assistance / Status			
General Process Requirements	Water	4892.....	Lynne Brosius
Laboratory Certification			
Bacteriological.....	Water	4968.....	Patrick Garrity
Lagoons – Construction (KPDES).....	Water	4896.....	Ronnie Thompson
Lake Information – Standards.....	Water	4856.....	Randy Payne
Landfills – Wastewater Permitting (KPDES)	Water	4954.....	Mahmoud Sartipi
Laundries – Wastewater Permitting (KPDES).....	Water	4954.....	Mahmoud Sartipi
Lead and Copper in Water	Water	4981.....	Todd Ritter
Line Extension Bans (Drinking Water).....	Water	4837.....	Terry Humphries
.....	Water	4801.....	Lissa Doss
.....	Water	4803.....	Kanaka Aspari
(Wastewater)	Water	4823.....	Harold Sparks
Loan Administration (Procurement)	Water	4971.....	Buddy Griffin
Maps – Floodplain	Water	4928.....	Carey Johnson
Maps – Geologic.....	Water	4932.....	David Jackson
Maps – Making Maps (see also GIS).....	Water	4945.....	Susan Cohn
.....	Water	4949.....	Jim Seay
Maps – Topographic w/ RMI Markings	Water	4949.....	Jim Seay
Maps – Water or Monitoring Wells	Water	4931.....	Jo Blanset
Medical Exams (Employee).....	Water	161.....	Ken Joyce
Memoranda of Agreement (MOA)	Water	4810.....	Ron Price
Monitoring Wells.....	Water	4940.....	Joe Moffitt
MORs (Monthly Operating Reports)	Water	4959.....	Frank Hall
Municipal Discharge Permitting (KPDES).....	Water	4894.....	Dan Juett
.....	Water	4893.....	William Shane
National Flood Insurance Program (NFIP).....	Water	4906.....	Chris Hart
.....	Water	4904.....	Russell Neal
Needs Survey	Water	4961.....	Shafiq Amawi
.....	Water	4839.....	Amanda Yeary
News Release, Press	Water	4962.....	Allison Fleck
No Discharge Certification or Operation Permitting (KPDES)	Water	4925.....	Ronnie Thompson
Non-Coal Mining (KPDES).....	Water	4893.....	William Shane
Non-Point Source (NPS) Information.....	Water	4909.....	Jim Roe
Oil & Gas (Activities and Registration).....	Water	4894.....	Dan Juett
.....	Water	4901.....	Diana Davidson
Ollie Otter	Water	4939.....	Jo Ann Palmer
On-Site Wastewater	Water	4942.....	Beth Finzer
Open Records Request (ORR).....	Water	4571.....	Morgan Elliston
Outstanding State Resource Waters.....	Water	4861.....	John Brumley
.....	Water	4856.....	Randall Payne

Payroll Checks, Distribution	Water	4806.....	Becky Correll
PCBs (Polychlorinated Biphenyls)	Water	4859.....	Eric Eisiminger
Permit Compliance System (PCS)	Water	4916.....	Jerry Milburn
PCS Printout Request	Water	4923.....	Vickie Prather
Permits			
Dams	Water	4992.....	Marilyn Thomas
.....	Water	4595.....	Gary Wells
Permits and Plans Review – Distribution	Water	4832.....	Greg Goode
Floodplains – Fill, Bridges, Shear Relocations	Water	4902.....	Todd Powers
KPDES.....	Water	4905.....	Barry Elmore
Water	Water		
Water Withdrawal.....	Water	4944.....	Rita Hockensmith
Personnel	Water	4806.....	Becky Correll
Pipelines and Paper Mills	Water	4924.....	Sara Beard
.....	Water	4896.....	Ronnie Thompson
Plan Review – Federal Assistance Request (Drinking Water).....	Water	4837.....	Terry Humphries
Plan Reviews (see also Permits)			
Drinking Water – Distribution	Water	4837.....	Terry Humphries
Drinking Water – Treatment.....	Water	4837.....	Terry Humphries
Wastewater Treatment Plants	Water	4924.....	Greg Goode
Planning, Watershed	Water	4908.....	John Webb
.....	Water	4927.....	Paulette Akers
Pond Construction	Water	4896.....	Ronnie Thompson
Power Plant Permitting (KPDES).....	Water	4882.....	Matt Graves
.....	Water	4924.....	Sara Beard
Press Releases	Water	4962.....	Allison Fleck
Pretreatment Programs (KPDES)	Water	4880.....	Jennifer Spradlin
PRIDE.....	Water	4961.....	Shafiq Amawi
Printout Request for PCS	Water	4916.....	Jerry Milburn
Program Planning	Water	4810.....	Ron Price
Public Education Program	Water	4962.....	Allison Fleck
Public Hearings.....	Water	4918.....	Ann Workman
Public Information Coordinator.....	Water	4962.....	Allison Fleck
Public Notification (Drinking Water)	Water	4987.....	Natalie Bruner
Public Notice – KPDES	Water	4918.....	Ann Workman
Purchasing	Water	4811.....	Linda Mitchell
.....	Water	4806.....	Linda Duncan
Quality Assurance.....	Water	4946.....	Lisa Hicks
Rainfall Intensity Values	Water	4992.....	Marilyn Thomas
.....	Water	4595.....	Gary Wells
Receipts	Water	4806.....	Linda Duncan
Reference Reach Program	Water	4870.....	Sue Bruenderman
Refunds, Agency.....	Water	4806.....	Linda Duncan
Regionalization (Wastewater).....	Water	4961.....	Shafiq Amawi
Regulation Development	Water	4808.....	Abigail Powell
Regulation Promulgation Status	Water	4808.....	Abigail Powell
Regulations, Proposed			
Regulations and Statutes	Water	4810.....	Ron Price
Requests for Copies	Water	4808.....	Abigail Powell
Review 201	Water	4912.....	Jill Bertelson
Safe Drinking Water Act	Water	4808.....	Abigail Powell
Safety Coordinator.....	Water	4814.....	Daniel Bishop
Sanitary Sewage Discharge Permits	Water	4905.....	Barry Elmore
Sanitary Sewer Overflows	Water	4852.....	Gary Levy
Sewage Treatment Plants (Municipal).....	Water	4805.....	Anshu Singh
Sewer Line Extension and Private Sewage Plants	Water	4823.....	Harold Sparks

Sewer Overflows (CSOs).....	Water.....	4852.....	Gary Levy
Sewer Sanctions.....	Water.....	4822.....	Hamid Beykezdeh
Soil Erosion	Water.....	4909.....	Jim Roe
.....	Water.....	4996.....	Brooke Shireman
Source Water Protection.....	Water.....	4934.....	Bill Caldwell
State Revolving Fund – Drinking Water	Water.....	4971.....	Buddy Griffin
State Revolving Fund – Wastewater.....	Water.....	4971.....	Buddy Griffin
Stone Quarry.....	Water.....	4893.....	William Shane
Storet			
Fecal Coliform.....	Water.....	4981.....	Todd Ritter
Stormwater – Discharge (KPDES) Construction.....	Water.....	4849.....	Alan Ingram
Stormwater – Discharge (KPDES) MS4.....	Water.....	4891.....	Abigail Rains
Straight Pipes.....	Water.....	4942.....	Beth Finzer
Surface Water Quality	Water.....	4861.....	John Brumley
.....	Water.....	4856.....	Randall Payne
Surface Water Withdrawal.....	Water.....	4933.....	Chris Yeary
Surplus Property	Water.....	4819.....	Brenda Conner
SWAPP.....	Water.....	4934.....	Bill Caldwell
Tap on Bans – Drinking Water.....	Water.....		vacant
Tap on Bans – Wastewater	Water.....	4852.....	Gary Levy
Technical Groundwater Issues.....	Water.....	4932.....	David Jackson
Total Maximum Daily Load (TMDLs).....	Water.....	4853.....	Amy Siewert
Toxicity Reduction Evaluations.....	Water.....	4881.....	Charles Clark
Toxicity Testing.....	Water.....	4881.....	Charles Clark
Training Coordinator	Water.....	4569.....	Lorrie Huffman
Underground Injection Control (UIC) Programs	Water.....	4932.....	David Jackson
Wage Rates (SRF)	Water.....	4990.....	Buddy Griffin
Wastewater Discharge			
Toxics Wasteloads and Modeling.....	Water.....	4914.....	Courtney Seitz
Wastewater Permitting			
Drinking Water Plants (KPDES)	Water.....	4896.....	Ronnie Thompson
Water Complaints	Water.....	4955.....	Sally Barclay
Water, Director	Water.....	4972.....	Sandra Gruzsky
Assistant Director	Water.....	4012.....	Peter Goodmann
Administrative Support.....	Water.....	4973.....	Jill Wilhelm
Compliance and Technical Assistance Branch, Manager.....	Water.....	4957.....	Tom Gabbard
Administrative Support.....	Water.....	4966.....	Melissa Baughn
Resource Planning and Program Support Branch, Manager.....	Water.....	4810.....	Ron Price
Administrative Support.....	Water.....	4811.....	Linda Mitchell
Surface Water Permits Branch, Manager.....	Water.....	4850.....	Jory Becker
Administrative Support.....	Water.....	4847.....	Mary Ann Craig
Water Infrastructure Branch, Manager	Water.....	4961.....	Shafiq Amawi
Administrative Support.....	Water.....	4970.....	Krystal Harrod
Water Quality Branch, Manager.....	Water.....	4858.....	Clark Dorman
Administrative Support.....	Water.....	4857.....	Kathy Clarkson
Watershed Management Branch, Manager.....	Water.....	4927.....	Paulette Akers
Administrative Support.....	Water.....	4930.....	Vacant
Water Availability	Water.....	4934.....	Bill Caldwell
Water Conservation	Water.....	4958.....	Julie Roney
Water Line Extensions			
Drinking Water – Distribution	Water.....	4837.....	Terry Humphries
.....	Water.....	4801.....	Lisa Doss
.....	Water.....	4803.....	Kanaka Aspari
Drinking Water – Treatment.....	Water.....	4823.....	Harold Sparks

Water Pollution Control.....	Water.....	4962.....	Allison Fleck
Water Quality Certification – Permit.....	Water.....	4874.....	Alan Grant
Water Quality Monitoring – Lakes.....	Water.....	4859.....	Eric Eisiminger
Water Quality Monitoring – Streams.....	Water.....	4861.....	John Brumley
Water Quality Report to Congress (305(b) Report).....	Water.....	4856.....	Randy Payne
Water Quality Standards.....	Water.....	4856.....	Randy Payne
Water Quality Standards Request.....	Water.....	4012.....	Peter Goodmann
Water Patrol – Locks and Dams.....		564-3074	
Water Supply Planning.....	Water.....	4934.....	Bill Caldwell
Water Supply Protection.....	Water.....	4934.....	Bill Caldwell
Water / Wastewater Operator Certification.....	DCA.....	652.....	Julia Kays
Water Watch.....	Water.....	4939.....	Jo Ann Palmer
Water Well Drilling and Enforcement.....	Water.....	4940.....	Joe Moffitt
Water Well Records.....	Water.....	4931.....	Jo Blanset
Water Withdrawal Database.....	Water.....	4944.....	Rita Hockensmith
Water Withdrawal Permitting.....	Water.....	4933.....	Chris Yeary
.....	Water.....	4944.....	Rita Hockensmith
Watersheds.....	Water.....	4927.....	Paulette Akers
Kentucky River Basin.....		859- 257-1299.....	Melissa McAlister
Licking River Basin.....	Water.....	4937.....	Lajuanda Haight-Maybriar
Salt River Basin.....	Water.....	4908.....	John Webb
Cumberland River Basin.....	Water.....	606-878-0157.....	John Webb
Upper Cumberland River Basin.....	Water.....	606-878-0157.....	John Webb
Four Rivers Basin.....	Water.....	606-878-0157.....	John Webb
Tennessee River Basin.....	Water.....	606-878-0157.....	John Webb
Mississippi River Basin.....	Water.....	606-878-0157.....	John Webb
Lower Cumberland River Basin.....	Water.....	606-878-0157.....	John Webb
Green River Basin.....	Water.....	270-746-7475.....	Dale Reynolds
Tradewater River Basin.....	Water.....	270-746-7475.....	Dale Reynolds
Ohio River Basin.....	Water.....	4908.....	John Webb
Big Sandy River Basin.....	Water.....	4908.....	John Webb
Little Sandy River Basin.....	Water.....	4908.....	John Webb
Tygarts River Basin.....	Water.....	4908.....	John Webb
Watershed Planning.....	Water.....	4908.....	John Webb
.....	Water.....	4927.....	Paulette Akers
Webpage Development – Drinking Water.....	Water.....	4838.....	Melissa Miracle
Well Tags and Forms.....	Water.....	4940.....	Joe Moffitt
.....	Water.....	4931.....	Jo Blanset
Wellhead Protection.....	Water.....	4933.....	Chris Yeary
Wells.....	Water.....	4940.....	Joe Moffitt
Wetlands Construction Permits.....	Water.....	4855.....	Barbara Scott
Wetlands / 401, 404 – Enforcement.....	Enforcement.....	564-2150.....	Jeff Cummins
Wild Rivers.....	Water.....	4864.....	Zack Couch
Wild Rivers / KRS Chapter 146 – Enforcement.....	Enforcement.....	564-2150.....	Jeff Cummins
Zebra Mussels.....	Water.....	4870.....	Sue Bruenderman

Commonwealth of Kentucky
Division of Water
Organizational Chart
 July 2011

