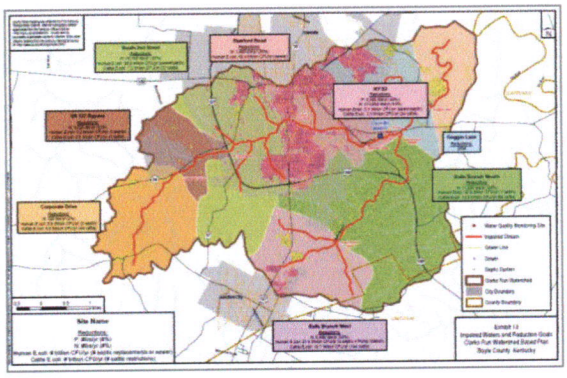
produce a relationship between near-bank shear stress, and observed annual erosion that can be used as a tool for predicting streambank erosion for similar streams in the future. No such relationships exist for streams in Kentucky and a predictive model developed in this watershed could be compared to those found in other states (Jennings and Harman 2001; Rosgen 2001; Van Eps et al. 2004).

Using information gathered from the Watershed Based Plan, two ideal areas for wetland restoration were located and the projects are currently underway. One of the wetland restorations within the city limits of London also involves the restoration of the adjacent stream channel.

Dix River Watershed Plan Development, Clark, Boyle, and Rockcastle Counties, KY

PROJECT HIGHLIGHTS: Developed two watershed-based plans; developed a TMDL for nutrients and supported *E. coli* TMDL; pioneered microbial source tracking monitoring; managed public outreach and education with citizen groups
PROJECT DURATION: March 2006 – January 2010
PROJECT STAFF: Steve Evans, Environmental Scientist; Jennifer Shelby, P.E., Water Resource Engineer; Bert Remley, Senior Biologist
REFERENCE: John Webb, Watershed Management; Kentucky Division of Water; 200 Fair Oaks Lane; Frankfort, KY 40601; (502) 564-3410



Third Rock was originally selected by the Kentucky Division of Water (KDOW) in 2006 to conduct extensive water quality investigations within the Dix River watershed. Because of the success of the project, Third Rock was awarded two subsequent contracts: (1) to indicate the fecal loading sources using microbial source tracking and (2) to prepare watershed based plans for two subwatersheds: Clarks Run and Hanging Fork.

To ensure data collection was sufficient to achieve the specific project objectives, detailed Quality Assurance Project Plans (QAPPs) were developed prior to the initiation of each phase of data collection. These documents provided details on project management, study design, data acquisition methods, assessment and oversight, and data validation and usability. Well-designed sampling plans ensured the project goals were achieved.

The project required the development and implementation of an extensive hydrology, water quality, and land use monitoring scheme, including the selection of laboratory parameters and monitoring stations needed. In over 100 field days, Third Rock collected samples from a total of 100 sampling sites over a 282,000-acre watershed. Monitoring include grab sample collection, water level data loggers, and insitu measurements. This sampling was used to develop a Total Maximum Daily Load (TMDL) to predict the loading within the watershed for *E. coli* and nutrients, and to prioritize water quality and habitat impairments in the watershed.

During the watershed based plan development, KDOW was in the process of developing a water quality database system and utilized Third Rock as the first consultant in Kentucky to test submission of data into this database. Working with KDOW, Third Rock was instrumental in developing a viable, electronic method (via a Microsoft Access database) for use by consulting firms/laboratories to download field and analytical data directly into the KDOW database. Third Rock developed procedures to integrate internal field data and information from various Laboratory Information Management Systems (LIMS) into a comprehensive deliverable format. Use of this electronic deliverable format for this watershed-scale project greatly facilitated data transfer to KDOW.

For this project, Third Rock developed the first microbial source tracking (MST) study for the Kentucky Division of Water. The sampling strategy involved multiple stages of testing using progressively more discriminating methodologies.

Fecal "hot spots" were identified for sampling for quantitative polymerase chain reaction (qPCR) methods, which determine the relative contribution of human and cattle sources using DNA targets. This pioneering monitoring effort elucidated that failing septic systems and other human sources were the primary cause of the fecal pollution, which directed remediation efforts accordingly.

In addition to the sampling tasks, Third Rock is also assisted the KDOW in the wide-scale public outreach, planning, and education components of the project. Third Rock personnel actively participated in Watershed Council meetings and provide presentations and exhibits that describe the ongoing effort of the project to the citizen group. Third Rock also conducted surveys to determine the stakeholder goals for the watershed and coordinated with the watershed council, health departments, county and city engineers and planners, college researchers, citizen's groups, and other stakeholders to develop action items and best management plans.

Through analysis of the sampling results and through surveys and coordination of public input, Third Rock developed watershed based plans for both Clarks Run and Hanging Fork as a result of this project. These plans prioritized sources of impairments, recommended remediation measures, developed an implementation plan, and defined ongoing monitoring efforts necessary to adjust planning efforts in the future. Responsible parties, technical assistance, costs, funding mechanisms, indicators of success, and milestones were specified for each of the action items specified.

Consent Decree and MS4 Permit Monitoring, Lexington, KY

PROJECT HIGHLIGHTS: water quality monitoring; watershed assessments; visual stream assessment; trend analysis
PROJECT DURATION: 2004–2014
PROJECT STAFF: Steve Evans, Chief Scientist; Jennifer Shelby, P.E., Water Resource Engineer; Bert Remley, Lead Biologist
REFERENCE: Susan Plueger, P.E., Former MS4 Coordinator; Lexington-Fayette Urban County Government; 301 Lisle Industrial Avenue, Town Branch Lab; Lexington, KY 40511; (859) 425-2800

Third Rock has a long history of performance for the Lexington-Fayette Urban County Government (LFUCG), having provided the urban county government services since our inception in 2001. We are an integral part of LFUCG's Consent Decree Management Consultant team as a subconsultant to Tetra Tech. Having worked extensively with LFUCG for many years to implement its stormwater management program, our role currently is to provide water quality consulting and watershed assessment and analyses as part of LFUCG's commitment under EPA's consent decree, while still continuing to provide KPDES permit watershed monitoring and reporting.

MS4 work has included:

- Quarterly dry and wet weather water quality monitoring at seven watershed sites and three Expansion Area 2 sites

- Annual macroinvertebrate and habitat assessment at seven watershed sites including laboratory sorting and identification of macroinvertebrate samples by Society for Freshwater Science certified taxonomists
- Annual fish monitoring at seven watershed sites
- Visual assessment of 80.9 miles of stream in four watersheds. Assessment included review of stormwater outfalls, utility and stream crossings, severe erosion, and trash and debris. Provided quality control and reporting for LFUCG's assessments of another two watersheds
- Revision of Water Quality and Biological Sampling Plan
- Worked in conjunction with the University of Kentucky to conduct microbial source tracking in the West Hickman watershed in order to identify priority areas for fecal remediation
- Annual reporting of monitoring data with comparison to benchmarks and past data. Reporting included the development of Watershed Fact Sheets for quick summaries, Watershed Technical Water Quality Evaluations for comprehensive watershed specific analyses including load duration curves, and a "Summary Status Rating" to characterize overall stream for non-technical readers
- Maintenance of water quality monitoring database
- Development and annual implementation of a Stormwater Monitoring Program Evaluation
- Development of Watershed Assessments to provide comprehensive characterization of the seven urban watersheds and the status of the streams located therein
- Provided training and technical support on monitoring and the results
- Conducted statistical analysis of trends in water quality data for 5-year period.

Stream Restoration Inspection and Maintenance, Louisville, KY

PROJECT HIGHLIGHTS: Identification and inspection of stream restoration projects; prepared Stream Restoration Maintenance Plans
PROJECT DURATION: 2010–2014
PROJECT STAFF: Rain Storm, Senior Biologist; Jennifer Shelby, P.E., Water Resource Engineer; Cory Bloyd, Environmental Technician
REFERENCE: Wesley Sydnor, P.E., MS4 Coordinator; Louisville and Jefferson County Metropolitan Sewer District (MSD); 700 West Liberty; Louisville, KY 40203; (502) 540-6274

Third Rock has provided services in support of MS4 Storm Water Program Assistance (post construction) for the Louisville and Jefferson County Metropolitan Sewer District (MSD) since 2010.

Third Rock's tasks have included:

- Identification of stream restoration sites for which MSD maintenance is required. This involved review of MSD files and/or US Army Corps of Engineers (USACE) and Kentucky Division of Water (KDOW) records.
- Reviewed documentation to acquire available restoration plans, construction plans, monitoring plans, or maintenance plans associated with each site to determine the intended site conditions, functions, and success criteria.
- Conducted field inspections of each site to determine compliance with the initial site plan

and documented existing site conditions and characteristics, including:

  - Visual assessment of stream bank and channel stability.
  - Developed a field data sheet for the targeted streams that included physical characterization and water quality, stream stability, riparian condition, and design compliance.
  - Examination of existing vegetation and identification of any undesirable invasive species.
  - Photographic documentation of site conditions and vegetation.
  - Recorded location of each stream and specific stream features and prepared mapping of each site.
- Identified sites that needed a remediation plan to comply with the initial restoration requirements and recommended specific remedial activities needed for each site.
- Compiled data and prepared a final report to document existing conditions of each site, determined if the sites are in compliance with the applicable restoration plans and success criteria, and provided recommendations for remedial work to achieve compliance.
- Prepared phased Stream Restoration Maintenance Plans for two stream restoration projects, which included bioengineering techniques for bank stability and riparian establishment.
- Provided construction over-site for the implementation of Stream Restoration Maintenance Plans for two projects.
- Prioritized stream maintenance needs for all stream restoration projects.

Wolf Run Watershed Plan Development, Lexington, KY

PROJECT HIGHLIGHTS: Water quality monitoring with volunteer involvement; hydrogeomorphic assessment; load calculation and allocation; development of Wolf Run Watershed Council; comprehensive implementation plan
Project Duration: 2010–2013
PROJECT STAFF: Steve Evans, Environmental Scientist; Jennifer Shelby, P.E., Water Resource Engineer; Bert Remley, Senior Biologist
REFERENCE: Susan Bush, P.G., Director, Division of Environmental Policy; Lexington-Fayette Urban County Government; 200 East Main Street; Lexington, KY 40507; (859) 425-2800

LFUCG contracted Third Rock to complete a watershed plan for Wolf Run Watershed under a 319(h) grant. This Kentucky Division of Water anticipates this watershed plan will serve as a model for watershed planning in urban watersheds across Kentucky.

Wolf Run Watershed is Lexington's most highly urbanized watershed, with about 40% of the surface covered with impervious material. The 13.5 miles of perennial streams and tributaries in the watershed drain an area of 10.18 square miles. The watershed has significant karst development including Preston's Cave, McConnell Springs, and Kenton Blue Hole among other features which complicates the hydrology by redirecting groundwater from the adjacent basins. Wolf Run Creek is listed as impaired on the 303(d) list for

nonsupport of primary and secondary contact recreation and partial support of warmwater aquatic habitat with cause including fecal coliform, nutrient / eutrophication biological indicators, and specific conductance from a number of suspected sources. The goal of the watershed plan was to identify the sources of pollution and the remediation efforts necessary to return the stream to its designated uses.

The Wolf Run Watershed Council was formed in December 2010 to receive input from the community on citizen desired goals and objectives for the watershed, to provide local knowledge on specific issues within the watershed, and to provide review and feedback on the plan progress.

All available data was compiled and reviewed to evaluate the additional data necessary to complete the plan. A plan was developed in April 2011 and executed from May 2011 to May 2012. Tasks included gathering data on the macroinvertebrate community, stream habitat, hydrogeomorphology, hydrology, and chemical water quality. The data was collected through a successful cooperative effort between of Friends of Wolf Run volunteers and Third Rock biologists and engineers.

The monitoring indicated that the aquatic macroinvertebrate community ranged from "poor" to "very poor" according to macroinvertebrate biotic index scores assessed at seven sites due to extremely low numbers of mayflies, stoneflies, and caddisflies. The habitat, assessed at 33 reaches according to the Rapid Bioassessment, ranged from 50 to 153, but with only 2 of the 33 reaches achieving a "fair" narrative criteria and all others "poor." Contributing factors to the poor scores included narrow riparian zone width, lack of pools and available cobble habitat, embeddedness, and poor base flow levels. Hydrogeomorphic assessments, conducted at nine sites, indicated the streams are generally over-widened and entrenched with significant channel alteration, bank armoring and bedrock substrate on many reaches. Sedimentation deposition and aggradation was noted downstream of Preston's Cave. Stage-discharge curves, developed for five locations in the watershed, indicate that streams were extremely flashy during storm events, but also sustain frequent and prolonged periods of dry or low flows.

Water quality monitoring results, sampled at 12 locations over 10 months, indicate nitrogen, phosphorus, dissolved oxygen, ammonia, specific conductance, suspended solids, and *E. coli* each exceed benchmarks for one or more events. Annual pollutant loads and reduction goals are calculated for nitrogen, phosphorus, suspended solids, and *E. coli*. Wet weather contributions to the annual loading are the most significant for *E. coli*, phosphorus, and suspended solids but less significant for nitrogen. *E. coli* load reductions of over 90% are required to reach the regulatory levels for recreational use. Significant load reductions in suspended solids and phosphorus are necessary in some subwatersheds and only slight load reductions in nitrogen are needed. A watershed-wide specific conductance survey (373 measurements in 8 days) indicates the highest concentrations were in the headwaters of Wolf Run, Vaughns Branch, and the Big Elm Tributary.

Based upon these results, the Wolf Run Watershed Council devised general goals and objectives for the watershed, and recommended the types of Best Management Practices and locations for implementation. Further, an Outreach Campaign Subcommittee was organized to develop an education and outreach plan for the watershed and a Water Quality BMP Technical Subcommittee was organized to review the Council recommendations and develop an implementation strategy with prioritized projects.

In January 2013, a comprehensive implementation plan was developed based on these efforts and presented for public comment. The plan identifies 138 BMP project opportunities in the watershed, 62 high-priority, 32 medium-priority, and 44 low-priority projects. These implementation projects include 18 BMPs targeted to address the *E. coli* load and sanitary sewer, 14 education and outreach BMPs, 39 green infrastructure BMPs, 16 trash and debris cleanup BMPs, a neighborhood association BMP program, and several target locations for streets and roads BMPs. Additional stream and habitat improvement opportunities include 3.5 miles of stream restoration, 5.6 miles of riparian buffer restoration, and approximately 850 feet of bank stabilization. Wetland creation or expansion is

proposed for approximately 20 acres and enhancements are proposed at two springs.

Implementation has been initiated or is planned for the near future on about 40 of these projects. Next steps include implementation of other identified opportunities, ongoing monitoring of the water quality improvements and implementation status, and adapting the plan to address the changing needs of the watershed.

SECTION 6 » FAMILIARITY WITH THE DETAILS OF THE PROJECT

OVERVIEW

The Tetra Tech team has been immersed in this project for the past 6 years as the current MS4 program manager. As such, we are intricately familiar with all three documents driving LFUCG's MS4 program – the Consent Decree, the MS4 permit, and the SWQMP. We developed the SWQMP alongside LFUCG management and legal counsel as part of LFUCG's negotiations with EPA and the state; thus, we know the intent of the requirements and how and why they came to be as they are.

This project is not about a finite, tangible end product, such as a capital project. Instead, this project is about helping LFUCG manage a program that affects what the staff and the public routinely do that contributes to the improvement of water quality. In simpler terms, this project is about people and working collaboratively with others. Our program management team has done that extremely well for the past six years. We know who to contact to obtain critical information needed to write reports for submittal to EPA and the state, and we know our audience when we compose the reports. We have worked hand-in-hand with LFUCG's regulators and hand-in-hand with LFUCG staff. We have engaged the public through our team's outreach efforts. In short, we are familiar with the project because we are involved with the people who are this project.

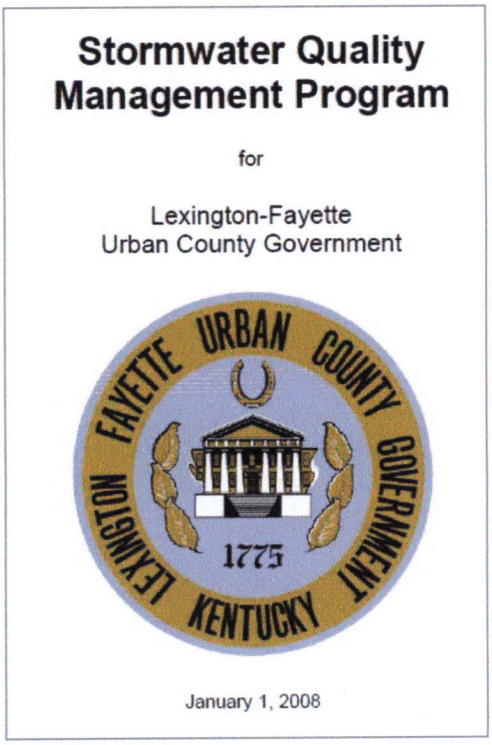
Our team and LFUCG staff have worked tirelessly for 6 years developing and implementing the many facets of Lexington's MS4 program. The pendulum has swung from non-compliance to compliance. Deadlines have been met; milestones have been reached. Measureable goals and permit requirements are continually being attained and completed. Some of the MS4 program elements have been built from scratch during this time period, and other elements which were already in place prior to lodging of the Consent Decree have required minor adjustments. We have helped LFUCG establish a solid foundation for the MS4 program and we have helped the staff to begin preparing for a new permit in 2014. While much has been accomplished, there is much yet to do. Our team has a vision for the MS4 program that is at the end of this section after we provide evidence of our unparalleled level of project familiarity.

We have structured this section of the proposal to reflect our familiarity in accomplishing the project goals listed under the scope of services in the Request for Proposal (RFP).

As you read this section of our proposal, keep in mind that the Tetra Tech team:

- *Knows the Consent Decree, MS4 permit, and SWQMP – their history and their intent*
- Knows and *works collaboratively* with all the staff implementing the stormwater program as well as the regulators inspecting and enforcing the program
- Has a *Vision for Water Quality Improvement* that involves watershed-based planning and enhancement of the monitoring program that is described at the end of this section.

FAMILIARITY WITH THE RFP SCOPE OF SERVICES


Stormwater Quality Management Program

for

Lexington-Fayette Urban County Government

January 1, 2008

Because of our work over the last 6 years with LFUCG, the Tetra Tech team has developed an in-depth understanding of how to assist LFUCG staff with implementing the various requirements of the Consent Decree, MS4 permit, and the SWQMP.

Tetra Tech developed the SWQMP under contract to LFUCG from 2006 to 2008. The SWQMP was developed to comply with the requirements of a draft MS4 permit public noticed by the KY Division of Water in 2006. The SWQMP was subsequently endorsed by USEPA and made part of the Consent Decree and the current MS4 permit.

The Consent Decree, MS4 permit, and SWQMP contain numerous requirements and deadlines for completing deliverables such as technical reports, conducting inspections, and developing new procedures for various components of the MS4 program. Our involvement in completing the deliverables is discussed in the following sections.

Tetra Tech is currently providing the services described in the RFP. This includes program management and scheduling; reviewing and modifying ordinances and procedures; technical writing; regulatory reporting; coordination with KDOW; permit negotiations; hands-on technical assistance; training, presentations, and workshops; maintaining a project database; and water quality monitoring. A summary of these activities is listed in the table on the next page, and illustrates that the Tetra Tech team has become integrated with the various divisions and staff of LFUCG.

PROGRAM MANAGEMENT AND SCHEDULING

Successful implementation of the Consent Decree and MS4 permit requires effective communication and coordination. There are many LFUCG divisions involved, and it is important to keep track of where we have been and where we are going.

To do this, we currently conduct the following activities with LFUCG staff:

- A Stormwater Program Implementation Team Meeting is held on the first Wednesday of each month, and staff from Water Quality, Environmental Policy, Engineering, Computer Services, and Law regularly attend. At this meeting, items of discussion include schedules, budgets, and upcoming deadlines. The meeting provides a forum to resolve issues that require the input of people from different LFUCG divisions. Tetra Tech facilitates these meetings: preparing and distributing the agenda, running the meeting, and providing detailed notes of decisions made and meeting minutes. All meeting materials are maintained on our Program Management SharePoint website.
- Tetra Tech also facilitates a monthly coordination meeting with the Divisions of Water Quality, Engineering, and Environmental Policy to address issues related to erosion control and post-construction stormwater controls.
- Tetra Tech routinely conducts meetings with smaller groups of LFUCG staff to review the progress of tasks that have been assigned during the coordination meetings.

LFUCG Division Role Related to the Consent Decree and MS4 Permit	Tetra Tech Services Provided to LFUCG as Part of Consent Decree and MS4 Permit Implementation								
	Program Management	Technical Writing	EPA , KYEEC Reporting	Ordinance & Policy Development	Training and Workshops	Water Quality Monitoring	Project Database	Critical Path Scheduling	Technical Support
Division of Water Quality									
Water Quality Management Fee	✓	✓	✓	✓			✓	✓	✓
Consent Decree Compliance	✓	✓	✓	✓	✓	✓	✓	✓	✓
MS4 Permit Compliance	✓	✓	✓	✓	✓	✓	✓	✓	✓
Watershed assessments	✓	✓	✓	✓			✓	✓	✓
Water quality monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓
Inspection of construction sites	✓	✓	✓	✓	✓		✓		✓
Inspection of detention basins	✓		✓		✓		✓		✓
Investigations of illicit discharges	✓	✓	✓	✓	✓		✓		✓
Inspection of industrial and commercial facilities	✓	✓	✓	✓	✓		✓		✓
Stormwater asset database management							✓		✓
Impaired stream pollutant loading estimates	✓	✓	✓	✓		✓	✓		✓
Division of Environmental Policy									
Enforcement of Stormwater Ordinances	✓	✓	✓				✓		✓
Inspection of LFUCG facilities	✓	✓	✓				✓		✓
LFUCG facility stormwater permit compliance	✓		✓				✓		✓
Review of municipal operations	✓	✓	✓				✓		✓
Public education/involvement/surveys	✓	✓	✓				✓		✓
Newsletters and email distribution list		✓	✓				✓		✓
Website content and maintenance		✓	✓				✓		✓
Division of Engineering									
Issuance of Land Disturbance Permits	✓	✓	✓	✓	✓		✓		✓
Review of construction plans	✓	✓	✓	✓	✓		✓		✓
Review of stormwater management plans	✓	✓	✓	✓	✓		✓		✓
Inspection of DOE capital construction sites	✓	✓	✓				✓		✓
Department of Law									
Ordinance development	✓	✓	✓				✓		✓
Ordinance revision and interpretation	✓	✓	✓				✓		✓

Scheduling

Tetra Tech reviews the Consent Decree, SWQMP, and MS4 permit deadlines at least once a month to ensure adequate progress is being made. We meet with staff as necessary to review work product well in advance of the deadline. In addition, we meet with the implementation team once a month to review the "dashboard" deadlines table (example below) to identify tasks that are behind schedule and to assign additional resources as necessary. This format has proven very effective in tracking deadlines with near-term and long-term deadlines.

Deadlines for MS4 Permit Extension (September 1, 2014 - December 31, 2014)

Task	Deadline	LFUCG Owner	Measurable Goal
Watershed Management			
Watershed Assessments	9/1/14	Greg Lubeck, Demetria Mehlhorn	WM-2
Public Education			
Planning Commission Presentation	12/31/14	C. Martin, J. Carey	PE-9
Urban County Council Presentation	12/31/14	C. Martin, J. Carey	PE-9
Update the website annually	9/1/14	Jennifer Myatt	PE-2
Create four press releases per year	9/1/14	Mark York	PE-3
Conduct 4 presentations/yr at community meetings	9/1/14	Jennifer Myatt	PE-7
Business and Industry Training	12/31/14	Richard Lamey	PE-9
Construction Industry Training	12/31/14	Kevin Lyne	PE-9
Public Involvement			
LexCall Training for correct use of codes	12/31/14	Richard Lamey	PI-2
Evaluate LexCall codes and make necessary changes	12/31/14	Richard Lamey	PI-1
Publish newsletter two times per year	9/1/14	Jennifer Myatt	PI-3
Facilitate four community activities per year	9/1/14	Mark York	PI-7
Mark 100 inlets per year	9/1/14	Jennifer Myatt	PI-8
Update storm drain marking map annually	9/1/14	Jennifer Myatt	PI-10
IDDE			
Dry weather screening at 125 locations/yr	12/31/14	Kevin Lyne	IDDE-7
Dry weather screening of major outfalls/2yrs	12/31/14	Kevin Lyne	IDDE-8
IDDE Training for LFUCG staff	9/1/14	Kevin Lyne	IDDE-23
IDDE Training for Business (SWPPP training)	12/31/14	Richard Lamey	IDDE-22
Inspect East Hickman watershed for illicit discharges	9/1/14	Richard Lamey	IDDE-5
Inspect West Hickman watershed for illicit discharges	9/1/14	Richard Lamey	IDDE-5
Inspect South Elkhorn watershed for illicit discharges	9/1/14	Richard Lamey	IDDE-5
Create two PSAs/yr about illicit connections and improper waste disposal	9/1/14	Jennifer Myatt	IDDE-20
Construction Site Runoff Control			
LFUCG Inspection Staff Training	9/1/14	Kevin Lyne	CS-13
Construction Industry Training	12/31/14	Kevin Lyne	CS-12
Monthly inspections of construction sites	Ongoing	Kevin Lyne	CS-6
Residential/Commercial (Post Construction)			
Pollution Prevention Training for the Public	3/31/14	Jennifer Myatt	PPRC-26
Update map of all stormwater controls	6/30/14	Chris Dent	PPRC-10
Develop map of storm sewer system	9/1/14	Robert Bowman	PPRC-11
Evaluate effectiveness of stormwater controls	9/1/14	Chris Dent	PPRC-21
Inspect private stormwater controls	Ongoing	Jennifer Carey	PPRC-12
Inspect detention basins two times per year	Ongoing	Jennifer Carey	PPRC-14
Inspect retention ponds once a month	Ongoing	Jennifer Carey	PPRC-15
Inspect critical culverts monthly and after 1" rain	Ongoing	Jennifer Carey	PPRC-16
Maintenance of LFUCG stormwater controls	Ongoing	Jennifer Carey	PPRC-9, 17
Maintenance of private stormwater controls	Ongoing	Jennifer Carey	PPRC-7, 18
Implement procedures to monitor selected structural BMPs	Ongoing	Jennifer Carey	PPRC-19
Municipal Operations			
Municipal Operations Staff Training	Ongoing	Demetria Mehlhorn	PPMO-17
Maintenance of LFUCG quality controls	Ongoing	Demetria Mehlhorn	PPMO-4
Inspect LFUCG stormwater controls	Ongoing	Demetria Mehlhorn	PPMO-12, 14
Implementation of O&M protocols for PPMO 6,7,8,9,10	Ongoing	Demetria Mehlhorn	PPMO-11
Industrial Facility/Municipal Waste Facility			
Conduct wet weather monitoring at the municipal waste facilities	12/31/14	Richard Lamey	IN-13
Industrial / HRC Training for LFUCG Staff	9/1/14	Richard Lamey	IN-24
Industrial / HRC Training for Facility Staff	12/31/14	Richard Lamey	IN-23
Industrial / HRC Training for the Public	12/31/14	Richard Lamey	IN-21
Update Industrial Facility Inventory	Ongoing	Richard Lamey	IN-1
Update HRC Inventory	Ongoing	Richard Lamey	IN-3
Dry weather screening of representative outfall locations	9/1/14	Kevin Lyne	IN-16
Inspect Industries every 2 years	Ongoing	Richard Lamey	IN-10
Inspect 20% of HRC Facilities each year	Ongoing	Richard Lamey	IN-11
Conduct dry weather screening of 90% of industrial outfalls every 2 years	Ongoing	Kevin Lyne	IN-14
Water Quality Monitoring			
2013 Annual Monitoring Program Evaluation	2/28/14	Greg Lubeck, Demetria Mehlhorn	MON-16
Ensure that USGS continuous monitoring equipment is installed in Wolf Run	7/1/14	Greg Lubeck	MON-7
Monitoring Training for LFUCG Staff	9/1/14	Richard Lamey	MON-6
Monitoring Training for the Public	9/1/14	Richard Lamey	MON-6
5-Year Trend Analysis	9/1/14	Greg Lubeck, Demetria Mehlhorn	MON-17
Quarterly Stream and Annual Fish, Macroinvertebrate, and Habitat Monitoring	Ongoing	Jennifer Carey	MON-1 to 6
Reporting and Record Keeping			
Consent Decree Quarterly Report	1/30/14	Charlie Martin	NA
Consent Decree Annual Report	1/31/14	Charlie Martin	NA
Consent Decree Quarterly Report	4/30/14	Charlie Martin	NA
MS4 Permit Annual Report	7/15/14	Greg Lubeck	RR-3
Consent Decree Quarterly Report	7/30/14	Charlie Martin	NA
Consent Decree Quarterly Report	10/30/14	C. Martin, J. Carey	NA

Green shading indicates M.G. is due this month or is on-going
Yellow shading indicates M.G. is due next month
Grey shading indicates M.G. is complete
Blue shading indicates M.G. is due this year

UPDATING THE SWQMP

Tetra Tech and LFUCG staff developed the SWQMP in 2008 and it has guided the activities that have led the MS4 program into compliance. The SWQMP was developed over several months by having numerous meetings with staff and getting their buy-in on meaningful measurable goals. Once the draft MS4 permit is issued, LFUCG will have 12 months to revise the SWQMP and to have it better reflect the current goals and objectives of LFUCG.

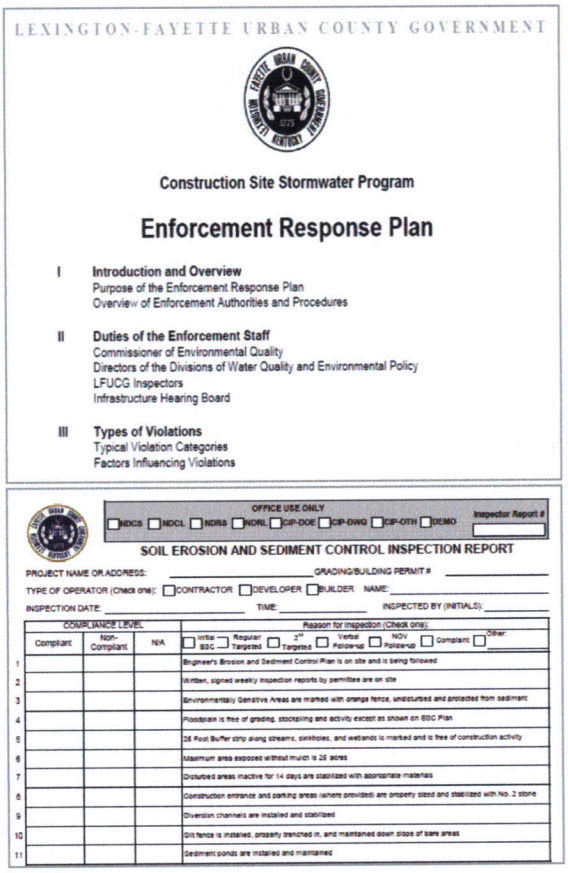
We anticipate that the process will again involve meetings with staff, but for this update it will also need to involve the Stormwater Stakeholder Advisory Committee.

CRITICAL REVIEW AND MODIFICATION OF ORDINANCES, GUIDANCE DOUCUMENTS, POLICIES, AND PROCEDURES

We propose that John Kosco lead this effort for Tetra Tech. John is a national MS4 expert with experience in MS4 permitting, program development, training and inspections/audits. He was with EPA for 9 years and was one of the co-authors of the stormwater Phase II rule. While at EPA, he also led the outreach effort after the Phase II rule was published and developed EPA's National Stormwater Menu of BMPs to support implementation of the rule. Since leaving EPA, Mr. Kosco has worked at Tetra Tech for the past 10 years where he leads Tetra Tech's support to EPA, states, and local governments as they implement the stormwater requirements. Mr. Kosco has led MS4 audits of over 120 municipal stormwater programs, and was the author of EPA's guidance document on how to conduct an MS4 audit (EPA's MS4 Program Evaluation Guide, 2007). Mr. Kosco also led Tetra Tech's support to EPA's stormwater outreach program, which included hosting over 20 stormwater webcasts and over 40 onsite stormwater training workshops. Mr. Kosco has also provided detailed, multi-day training to stormwater staff in at least five states on permitting, program requirements, and inspection/audit procedures.

TECHNICAL WRITING AND PROGRAM DEVELOPMENT

Under our current contract, the Tetra Tech team has prepared and provided input on numerous technical documents to help the staff implement the SWQMP and comply with the Consent Decree and MS4 permit. These documents establish the standard operating procedures for various elements of the program and are the foundation for future compliance.



LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT

Construction Site Stormwater Program

Enforcement Response Plan

I **Introduction and Overview**
Purpose of the Enforcement Response Plan
Overview of Enforcement Authorities and Procedures

II **Duties of the Enforcement Staff**
Commissioner of Environmental Quality
Directors of the Divisions of Water Quality and Environmental Policy
LFUCG Inspectors
Infrastructure Hearing Board

III **Types of Violations**
Typical Violation Categories
Factors Influencing Violations

OFFICE USE ONLY ☐NDCS ☐NDCL ☐NDRS ☐NDRL ☐CIP-DOE ☐CIP-DWG ☐CIP-OTH ☐DEMO Inspector Report #

SOIL EROSION AND SEDIMENT CONTROL INSPECTION REPORT

PROJECT NAME OR ADDRESS: _____ GRADING/BUILDING PERMIT # _____

TYPE OF OPERATOR (Check one): ☐CONTRACTOR ☐DEVELOPER ☐BUILDER NAME: _____

INSPECTION DATE: _____ TIME: _____ INSPECTED BY (INITIALS): _____

	COMPLIANCE LEVEL			Reason for Inspection (Check one): ☐ Initial BSC ☐ Regular/ Targeted ☐ 2nd Targeted ☐ Verbal Follow-up ☐ NOV Follow-up ☐ Complaint ☐ Other:	
	Compliant	Non-Compliant	N/A		
1				Engineer's Erosion and Sediment Control Plan is on site and is being followed	
2				Written, signed weekly inspection reports by permittee are on site	
3				Environmentally Sensitive Areas are marked with orange fence, undisturbed and protected from sediment	
4				Floodplain is free of grading, stockpiling and activity except as shown on BSC Plan	
5				25 Foot Buffer strip along streams, sinkholes, and wetlands is marked and is free of construction activity	
6				Maximum area exposed without mulch is 25 acres	
7				Disturbed areas inactive for 14 days are stabilized with appropriate materials	
8				Construction entrance and parking areas (where provided) are properly sized and stabilized with No. 2 stone	
9				Diversion channels are installed and stabilized	
10				Silt fence is installed, properly trenched in, and maintained down slope of bare areas	
11				Sediment ponds are installed and maintained	

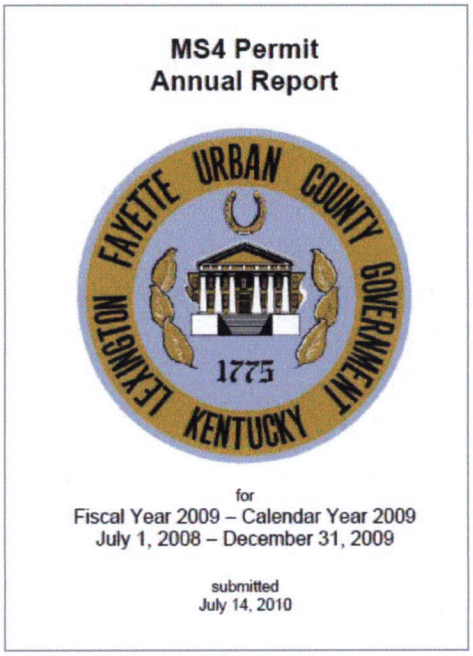
A list of the key documents follows:

- Enforcement Response Plan for Construction Sites
- Enforcement Response Plan for Private Property Maintenance of Stormwater Controls
- Enforcement Response Plan for Industrial and High-Risk Commercial Facilities
- Procedures for Summary Review of Construction Plans

- Stormwater Pollution Prevention Plan Template for Construction Sites
- Stormwater Pollution Prevention Plan Template for LFUCG Linear Projects
- Stormwater Pollution Prevention Plan Template for Industrial and High-Risk Commercial Facilities
- Land Disturbance Permit Application Form and Checklist
- Stormwater Management Plan Review Checklist
- Permit Checklists for Work in and Along Streams
- Guide for Working in and Along Streams
- Updates to the Stormwater Manual (2009 and 2011)
- Review of stormwater design standards and comparison to EPA guidance
- Permit applications for sewer rehabilitation and capital project work in and along streams and developing an SOP for future work to occur in floodplains
- Water Quality Management Fee Task Force Report to Council
- Template for Watershed Assessments
- Programmatic Quality Assurance Program for monitoring.

USEPA / KY DIVISION OF WATER (KDOW) COMPLIANCE REPORTS

An important part of the Consent Decree and MS4 permit implementation is providing the documentation to prove that the various requirements have been met. Without documentation, EPA can only assume that an activity, be it an inspection, a training workshop, or the like, did not take place. Failing to provide documentation to EPA can put LFUCG at risk of incurring fines, stipulated penalties, and, ultimately, enforcement actions. Similarly, KDOW refers to a lack of documentation as LIP, or lacking in paperwork, and LIP can lead to NOVs or Notices of Violation. To ensure thorough documentation of LFUCG's MS4 program, Tetra Tech has developed a streamlined system for obtaining and preparing the necessary documentation to ensure compliance.


MS4 Permit
Annual Report

for
Fiscal Year 2009 – Calendar Year 2009
July 1, 2008 – December 31, 2009

submitted
July 14, 2010

A summary our past and ongoing activities follows:

Past Activities

- Prepared 22 Consent Decree Quarterly reports and 6 Consent Decree Annual reports to EPA/KYEEC
- Prepared 6 Annual MS4 permit reports to KDOW.

Current Activities

- Obtain and organize the information necessary for upcoming Consent Decree reports and MS4 permit reports
- Assist LFUCG staff with compiling the stormwater budgets and expenses for the various divisions for the Annual MS4 permit report
- Maintain monthly construction site inspection data by LFUCG staff
- Maintain monthly detention basin and retention pond inspection data by LFUCG staff
- Maintain monthly and rainfall-driven drainage infrastructure inspection data by LFUCG staff

- Maintain a list of public education and involvement activities each quarter
- Maintain a project document website (SharePoint) for hosting all working and final documents.

MS4 INSPECTIONS

Tetra Tech planned, scheduled, and prepared the necessary documentation for KDOW inspections in 2010 and 2012, both of which found no deficiencies. We place emphasis on collecting and compiling compliance documentation each month related to the Consent Decree and MS4 permit, such as inspections completed, reports submitted, enforcement actions taken, etc. In fact, our guiding principle is to always be ready for a KDOW or EPA inspection. We have excellent working relationships with KDOW staff and we know what they expect. We anticipate the next inspection will be in 2015, and we will use the same processes and procedures that were successful in the past.

KPDES PERMIT APPLICATIONS AND NEGOTIATIONS

Tetra Tech has been intimately involved with the MS4 permit process in 2014. We prepared the formal application letter and had numerous discussions with KDOW staff over the last eight months. In addition, we had several meetings with the Stormwater Stakeholder Advisory Committee to obtain their input. The draft permit that was issued to LFUCG in September achieves the regulatory objectives of KDOW while meeting the local goals and objectives of the community. Tetra Tech would use this approach when the permit is up for renewal in 2019.

PREPARATION OF DOCUMENTS TO JUSTIFY TERMINATION OF STORM SEWER COMPLIANCE MEASURES IN THE CONSENT DECREE

In the near future, LFUCG will be positioned to request termination of the storm sewer provisions of the Consent Decree because all of the requirements will have been met. This will require a formal application to EPA and the Commonwealth of Kentucky that sets forth the justification for termination. As a result of our work over the last six years, Tetra Tech has a highly organized system of documentation for each of the 40 storm sewer provisions in the Consent Decree.

HANDS-ON TECHNICAL ASSISTANCE

In addition to the program management tasks covered previously in this section, we have provided significant hands-on technical assistance related to the implementation of the Consent Decree, MS4 permit, and SWQMP obligations, as well as technical assistance related to other program management matters, during the past six years. A sampling of the support and assistance we have provided is listed below:

- Coordinated LFUCG's pre-inspection response prior to the KDOW's MS4 Inspection in August 2010 and 2012
- Coordinated LFUCG's response to the EPA Questionnaire on Stormwater Management Including Discharges from Developed Sites in October 2010
- Compiled initial and first annual update to the High-Risk Commercial Facility inventory and conducted the initial round of inspections
- Completed compliance inspections of over 50 construction sites
- Provided technical review and comment on the following ordinances that streamlined the Code of Ordinances and improved enforcement:
  - Reduction of Soil Erosion
  - Private Property Maintenance of Stormwater Controls
  - Industrial/High-Risk Commercial Facilities
  - Illicit Discharge Detection and Elimination
  - Civil Fines and Enforcement
  - Water Quality Management Fee.
- Conducted project management services on implementation of the Water Quality Management Fee

TRAINING, PRESENTATIONS, AND PARTNERING WORKSHOPS

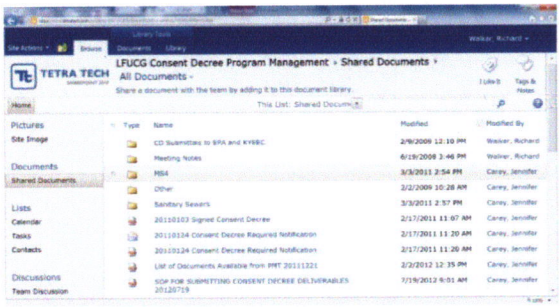
One of the goals of LFUCG is to provide the necessary training to staff so they can successfully implement the various elements of the SWQMP. Likewise, LFUCG has a goal to educate and update the public about the stormwater program and water quality.

Following is a summary of the training we have conducted and training and presentation assistance we have provided:

- Conducted numerous training sessions for Construction Site Inspectors
- Conducted training sessions for Illicit Discharge Detection and Elimination Inspectors
- Conducted training sessions for Industrial/High-Risk Commercial Facility Inspectors
- Conducted training sessions for Industrial/High-Risk Commercial Facilities
- Prepared training presentations for the Urban County Council and Planning Commission
- Conducted workshops for the Development and Construction Industry
- Assisted in creating the Stakeholder Advisory Committee in 2010 and have made several presentation to the committee
- Prepared the Water Quality Program Training Module presented in June 2011
- Coordinated the planning and execution of a public survey and public education program related to stormwater and water quality awareness.

SHARED PROJECT DOCUMENTATION DATABASE

We have developed and currently maintain a SharePoint website for use by LFUCG staff. The website is a "document center" for all of the reports, studies, and other deliverables required by the Consent Decree and MS4 Permit. The website provides a useful tool for efficiently sharing up-to-date information among multiple users.



Features of the website include a calendar, schedule of upcoming meetings, meeting notes, copies of all deliverables submitted to EPA, and copies of reports, checklists, PowerPoint presentations, and protocols developed by the Tetra Tech team and LFUCG staff.

WATER QUALITY MONITORING AND ASSESSMENT PROGRAM

Tetra Tech staff and Third Rock staff have been providing services for the monitoring portion of the MS4 Permit since the initial permit application in 1992. Richard Walker was involved in preparing the first permit application to KDOW in 1992; this group has provided stormwater monitoring services required by the MS4 permit ever since. The data from the monitoring efforts have been used by KDOW in its assessments of stream water quality.

Stormwater Program Monitoring

Third Rock currently provides monitoring services for water chemistry, physical habitat, and biological sampling for stream sites located in all seven watersheds covering Fayette County. Watersheds include Wolf Run, North and South Elkhorn, East and West Hickman, Town Branch, and Cane Run.

Third Rock's staff provides sampling at multiple sites including monitoring of the municipal waste facilities' outfalls and Expansion Area 2 sampling locations for MS4 permit and Consent Decree compliance. Because storm event sampling is included in the water chemistry collections, the sampling effort requires mobilization of multiple staff often with little notice. Rain events, although sampled quarterly, must be sampled when specified criteria for storm events are reached. Dry weather monitoring is also conducted quarterly as part of the water chemistry analysis. Strong relationships and coordination with a laboratory are essential to this sampling effort.

Third Rock samples streams within the seven watersheds annually for macroinvertebrates and fish. A physical stream habitat evaluation is also conducted. Electroshocking is used to sample and identify fish populations and an analysis of data is prepared to evaluate the population. Third Rock staff collect macroinvertebrate samples and laboratory sorting and identification are completed in Third Rock's in-house laboratory. This comprehensive approach allows Third Rock to provide an ongoing evaluation of the quality of Fayette County's surface water.

Stormwater Program Data Analysis and Reporting

In addition to sample collection, Third Rock analyzed the data from the 2010 water quality monitoring along with the data collected in previous years under LFUCG's water quality monitoring program. This included analysis of long-term data and data from historic monitoring stations to provide a comprehensive summary of all data generated under the monitoring program. The data were compared over time, between stations, and to regulatory benchmarks and non-regulatory reference points. The available water quality, biological, and stream habitat data were extensively evaluated using numerous statistical and graphical methods to determine relative stream health and trends in water quality over time for each of LFUCG's seven watersheds. During the data analysis, immense amounts of data were condensed and appropriate analyses performed to extract valuable conclusions. Third Rock's water quality professionals developed a protocol to characterize overall stream health based on the conclusions from the data analysis using a summary status rating of good, fair, poor, or very poor. The summary status rating, while based on vast amounts of data and analysis, was easy for technical and non-technical audiences to understand and make comparisons across sites or parameter types. All data and results were presented in the 2010 Monitoring Program Evaluation Report drafted by Third Rock.

In addition to the presentation of available data in the annual Monitoring Program Evaluation Report, Third Rock built a database to include all current and historic monitoring data that allows easier access and use of the data, while supporting statistical data analysis.

Stormwater Monitoring Program Evaluation Development and Implementation

To provide a comprehensive evaluation of LFUCG's stormwater program as a whole, Third Rock developed a protocol that considers 13 indicators to determine the success of the LFUCG stormwater monitoring program, indicate if the conditions of the MS4 permit have been satisfied, and reveal whether current monitoring practices are sufficient to evaluate pollutant levels from stormwater runoff to the MS4. The implementation of the protocol has successfully directed the program towards a more cost effective, adaptive, watershed based sampling program. The evaluation identified multiple monitoring parameters which had not yielded actionable data, and recommended these parameters be dropped or the frequency reduced – recommendations which were adopted by the KDOW in the draft permit. It also recommended a more watershed focused monitoring regime, which would enable prioritization of catchments across the MS4 remediation. These recommendations lead to net financial gain for LFUCG as well as practical gain in the value of the collected data.

Water Quality and Biological Sampling Plan Update

Third Rock revised the Water Quality and Biological Sampling Plan, Appendix V of LFUCG's Stormwater Quality Management Program document, in 2010 to