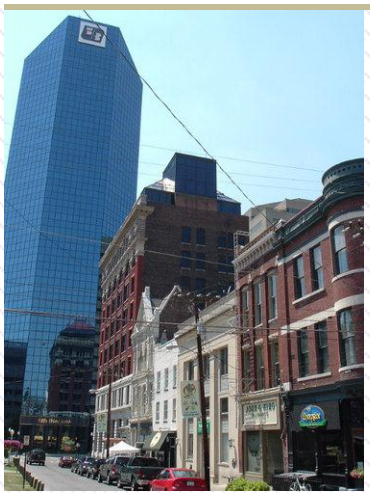
Proposal for Professional Engineering Services »

RFP 57-2014

Municipal Separate Storm Sewer System (MS4)
Annual Program Management Services



TETRA TECH

THIRD ROCK CONSULTANTS

October 13, 2014

TABLE OF CONTENTS

Aerial of Downtown Lexington

TETRA TECH

October 13, 2014

Purchasing Director
Lexington-Fayette Urban County Government
Room 338, Government Center
200 East Main Street
Lexington, KY 40507

Attn.: Selection Committee
RE: Tetra Tech Proposal (RFP 57-2014)
Municipal Separate Storm Sewer System (MS4) Annual Program Management Services

Dear Selection Committee Member:

The **Tetra Tech / Third Rock Consultants team** has been the MS4 Program Manager for LFUCG for the last 6 years, and the work described in this RFP is a continuation of the work that we have been doing since 2008. During this time, the Tetra Tech and LFUCG team have accomplished a track record of success as evidenced by the following:

- LFUCG is in compliance with all 40 MS4 performance standards in the Consent Decree
- LFUCG is in compliance with all 153 MS4 permit requirements, along with 167 measurable goals in the Stormwater Quality Management Program
- The Kentucky Division of Water (KDOW) inspected LFUCG's MS4 program in 2010 and 2012 and found no deficiencies.

Tetra Tech helped your staff build a solid foundation for the MS4 program that will ensure continued regulatory compliance and that will lead to long-term improvement in the water quality of Fayette County streams.

We ask you to consider the following reasons for selecting the Tetra Tech team to continue as the MS4 Program Manager.

1 **We have a proven record of performance.** As indicated above, with our team in place as the MS4 Program Manager, LFUCG is in compliance with all MS4 permit and Consent Decree requirements. We have been highly responsive, and our work has been of high quality, on schedule, and within budget. We have built a relationship of mutual trust and respect, which has allowed us to work as an extension of your staff. Furthermore, we have developed a cost-effective system of scheduling, reporting, and document management that saves your staff time and money.

2 **We understand what EPA and the KDOW expect from LFUCG.** Because of our work over the last 6 years, we have first-hand experience with the Consent Decree and MS4 Permit. *There will be no learning curve*. We have worked closely with LFUCG management and legal counsel on all aspects of the Consent Decree and MS4 permit negotiations. Because of this background, we know what EPA and the KDOW expect from LFUCG, and have maintained an excellent working relationship with them. In fact, our project team includes staff who previously worked for EPA on the development of the stormwater regulations, who continue to provide technical support to EPA.

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In addition, our team fully understands the proposed requirements in the draft MS4 permit issued for public comment on September 29, 2014 by KDOW. Tetra Tech has been working with LFUCG management and KDOW for 8 months on the draft language, with the goal of having a permit that is tailored to the needs of LFUCG while meeting the regulatory objectives of KDOW. We prepared the permit application that included 31 requested changes to the current permit, most of which were incorporated into the draft permit language. In addition, we reviewed advance copies of the draft permit with LFUCG management and proposed changes where necessary.

3 **We have a vision for the future.** In Section 6, we have included a Vision for Water Quality Improvement that discusses LFUCG's achievements over the last 6 years, an assessment of the basic water quality problems in Fayette County, and a roadmap for the future that involves watershed-based planning and management. In addition, it describes the "watershed-focused monitoring expansion" that is envisioned in the draft MS4 permit. These will be important topics as LFUCG begins to address Total Maximum Daily Load implementation plans.

The management of this project, and nearly all of the work on this project, will be by people currently working in the Lexington offices of Tetra Tech and Third Rock Consultants. Being local to the community means we are *personally invested* in improving the *quality of life* in Lexington, and we take great satisfaction in working *together with you* to reach your goals. We look forward to working with you on this project!

Sincerely,

Richard W. Walker

Richard W. Walker, P.E.
Vice President

SUMMARY OF TETRA TECH and THIRD ROCK QUALIFICATIONS

To facilitate the review of the attached proposal, we have summarized key aspects of our team's ability to satisfy your scoring criteria. Additional information is provided in the locations referenced.

Selection Criteria	Tetra Tech and Third Rock Highlights	Proposal Section
Cost of Services	• We have been LFUCG's MS4 program manager for 6 years. During this time, our annual fees have been below LFUCG's budget.	Section 1
Specialized Experience and Technical Competence	• Current MS4 Program Manager, which means an in-depth working knowledge of LFUCG's programs and processes and no learning curve • Worked hand-in-hand with LFUCG management and KDOW on the draft MS4 permit • Innovative water quality data analysis and communication to the public	Section 2
Capacity to Perform the Work	• Local staff with proven experience in providing MS4 program management services • Resource pool of over 200 specialized stormwater experts and professionals • Access to more than 14,000 professionals worldwide	Section 3
Character, Integrity, and Reputation	• Ongoing, trusted working relationship with staff in the Divisions of Water Quality, Environmental Policy, Engineering, Planning, and Law • Strong national reputation – since 1966	Section 4
Past Record of Performance	• Proven performance as LFUCG's MS4 Program Manager • Conducted stormwater monitoring in Fayette County since 1992 • National experience in providing stormwater technical services to EPA, states, and cities	Section 5
Familiarity with the Project	• Developed LFUCG's Stormwater Quality Management Program that is part of the Consent Decree and MS4 permit • Developed scheduling, reporting, and document management systems used by LFUCG staff • Understanding of the draft MS4 permit and the water quality problems in Fayette County	Section 6
Degree of Local Employment	• Over 90% of staff hours are for people currently working in Lexington	Section 7

SECTION 1 » ESTIMATED COST OF SERVICES

OVERVIEW

The RFP acknowledges that there is uncertainty associated with implementing the MS4 provisions of the Consent Decree, draft MS4 permit, and the SWQMP. Thus, it is difficult to provide a precise estimated cost of services. However, to be responsive to the RFP, we have attempted to estimate these costs with the understanding that they are planning-level estimates. Based upon our past work and current understanding of the draft MS4 permit, we believe the estimated annual costs for the core services described in the RFP will range from $400,000 to $600,000, depending upon the level of involvement by LFUCG staff. **Over the past 6 years, our annual fees have consistently been below the annual budget established by LFUCG.**

The following schedule of hourly rates is in effect for the duration of the contract (5 years) for all employees of Tetra Tech and Third Rock Consultants who are reasonably expected to contribute significant time to the final work product. These rates are limited to those individuals expected to contribute a minimum of 10% to the overall work product described in LFUCG's RFP scope of services. Final contract price will be negotiated and determined after refinement of the scope in the initial scoping meetings.

Name	Classification	Hourly Billing Rate
Richard Walker	Program Manager	$210
Barry Tonning	Stormwater Policy Analyst	$135
Laura Sheeran	Project Engineer I	$95
Christopher Diehl	Project Engineer III	$135
Shann Easterling	Senior Technician	$95
Steve Evans	Environmental Scientist	$145
Jennifer Shelby	Environmental Engineer	$145
Bert Remley	Environmental Scientist I	$105
Cory Bloyd	Environmental Scientist III	$75
Field monitoring staff	Environmental Technicians I and II	$55–$65

COST CONTROL

Tetra Tech is keenly aware of the need to control costs. We understand the importance of completing a task on time and within the budget that LFUCG agrees to at the beginning of that task. To that end, we will continue to use a task order method of conducting work, which we have been using over the last 6 years under our current contract. We will develop a written scope of work for each task order, with a schedule and estimated hours / fee for various staff to complete the work. We will not begin work until the LFUCG project manager has given us written approval of the task order.

To develop the scope of work for each task order, we will use a concept that has proven successful on many projects, including our current program management contract with LFUCG. That concept is to start work on a task with a *Begin with the End in Mind* attitude. It is important for our staff and the LFUCG project manager to clearly understand and articulate what the end product will be. To develop the scope of work for each task order, we will conduct a meeting with the LFUCG project manager and other LFUCG staff as needed to ensure that the end product is clearly identified. Once the task order is approved, we will hold periodic progress meetings to ensure the project is on schedule and that *scope creep* does not occur. Changes to the original task order scope of work will not happen unless the LFUCG project manager has given written approval.

SECTION 2 » SPECIALIZED EXPERIENCE AND TECHNICAL KNOWLEDGE

OVERVIEW

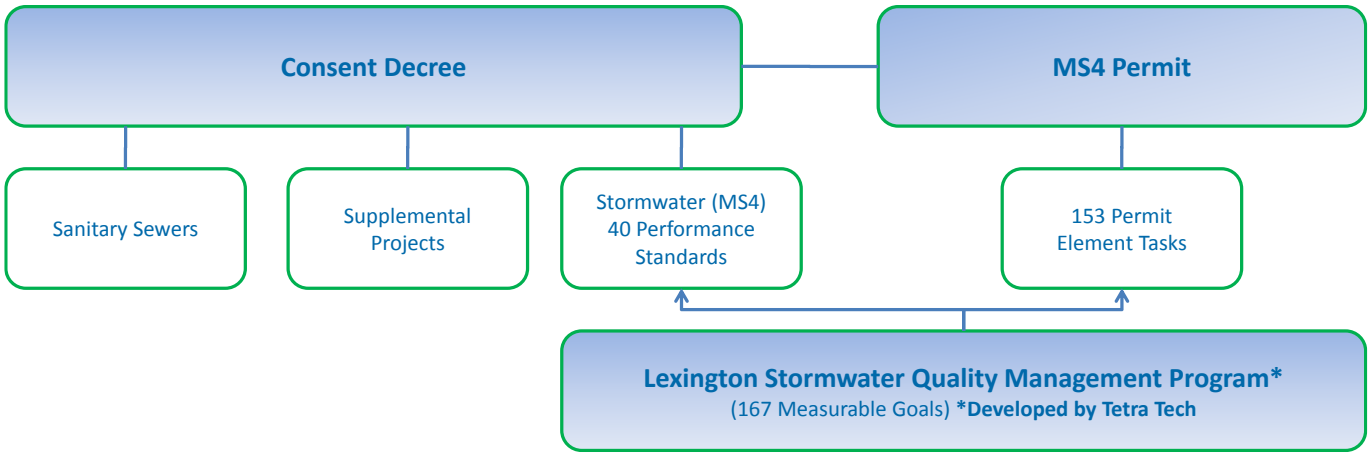
The Tetra Tech team provides LFUCG a rich blend of in-depth local knowledge and national experience to continue the implementation of LFUCG's Consent Decree and MS4 permit – as we have done for the last 6 years. This combination offers Lexington a perspective and knowledge base that can address the specific local issues that are your immediate priority, while keeping anticipated future regulatory requirements in mind. This will lead to innovative, cost-effective solutions that accomplish multiple objectives.

Nationally, Tetra Tech has been ranked No. 1 in Water by *Engineering News-Record* for more than 10 consecutive years. We have a continuous focus on providing clear solutions to client challenges. Tetra Tech has a national reputation as a leader in stormwater and watershed planning. At the federal level, Tetra Tech is the consultant contractor for USEPA's stormwater program. In this role, we provide technical support, technical tools / guidance manual development, and case study assessment of potential impacts of proposed regulations, among other activities. Tetra Tech wrote USEPA's watershed planning handbook, and we have completed thousands of Total Maximum Daily Loads (TMDLs) across the country.

This understanding of the regulatory framework has translated into implementation of programs at the state and local level. We have supported Pennsylvania and Minnesota in development of their state programs. At the local level, we have worked closely with clients that include major cities and small communities in implementing a range of stormwater programs, from standards to processes to development of implementation priorities. These municipal programs have been driven by MS4 and TMDL programs. Municipalities served at the local level include major metropolitan areas and small communities in multiple states.

Lessons learned through the multiple levels of stormwater programs (federal, state, and local) provide a one-of-a-kind background in stormwater management that is currently provided to LFUCG. Our local staff has direct access to the specific individuals who have worked on these projects, and will continue integrating this specialized expertise directly into LFUCG's stormwater program.

The following pages further discuss some of Tetra Tech's skills in stormwater management and MS4 programs, followed by a section on Third Rock Consultants' specialized experience. Further information on projects is included in Section 5.



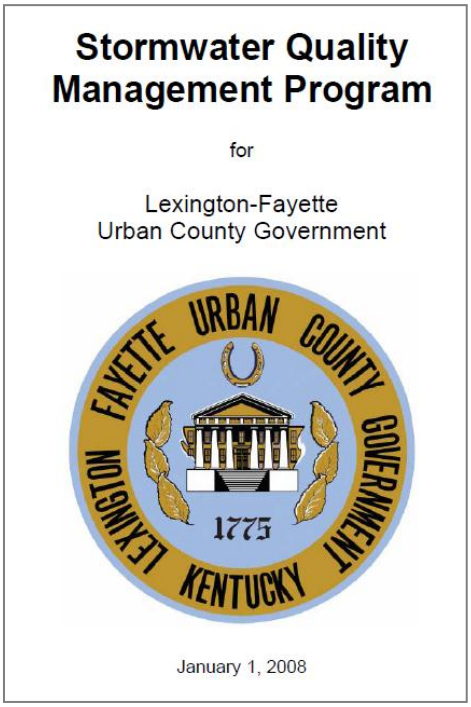
SPECIALIZED LFUCG EXPERIENCE

Tetra Tech has been working hand-in-hand with LFUCG staff to successfully implement the stormwater provisions of the Consent Decree and the MS4 permit for the last 6 years. As a result, we fully understand how to work with the various LFUCG departments and divisions to gain needed information and to implement new procedures and operating protocols. Section 6 describes our familiarity with the Consent Decree, MS4 permit, and Stormwater Quality Management Program (SWQMP).

Thanks to our involvement and close working relationship with LFUCG, Tetra Tech provides an unmatched *specialized experience and technical competence* in our understanding of the SWQMP. In 2006, the USEPA and Commonwealth of Kentucky sued LFUCG for violations of the Clean Water Act (CWA). As part of the negotiations with USEPA and the Commonwealth, LFUCG retained Tetra Tech to develop the SWQMP, which was incorporated into the Consent Decree and the MS4 permit.

The SWQMP is a comprehensive program to ensure compliance with the MS4 permit and reduce the pollutants from the MS4. It contains the procedures and protocols for implementing best management practices by City staff in the various departments and divisions. The SWQMP addresses the following elements:

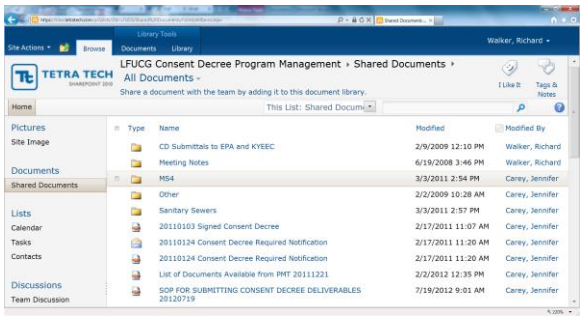
- Watershed management
- Legal prohibition and control authority
- Public education and outreach
- Public involvement and participation
- Illicit discharge detection and elimination
- Construction site stormwater runoff control
- Pollution prevention in residential and commercial areas
- Pollution prevention for municipal operations
- Industrial facility and municipal waste facility stormwater pollution prevention
- Water quality monitoring
- Reporting and recordkeeping.



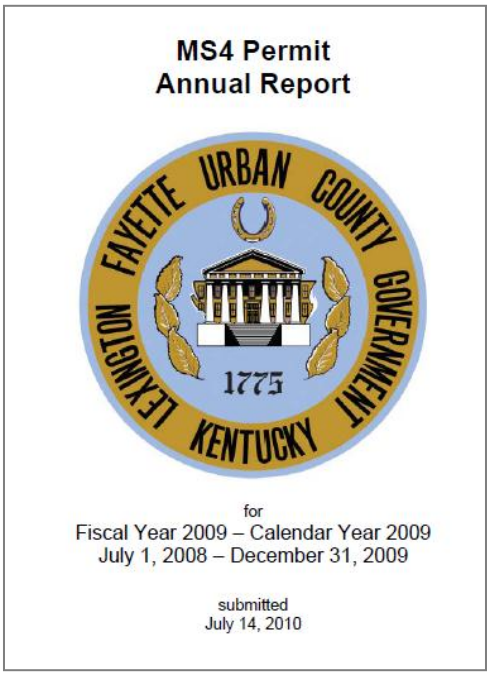
Documentation and regulatory reporting to USEPA and the KY Division of Water (KDOW) are critical parts of the project that Tetra Tech is currently providing. Documentation is critical to the success of implementing the Consent Decree. Without sufficient documentation, USEPA assumes an activity did not happen. Likewise, the Kentucky Division of Water (KDOW) requires sufficient documentation of permit requirements, and without it, a community can be cited for Lacking in Paperwork (LIP). Tetra Tech has developed a streamlined system to complete quarterly and annual reports and submit required reports/studies to USEPA and KDOW. The following table is a snapshot of the magnitude of reporting that has been accomplished over the last 6 years.

EPA/KYEEC Reports Prepared by Tetra Tech	Number
MS4 Annual Reports	6
Consent Decree Annual Reports	6
Consent Decree Quarterly Reports	22

To aid in the documentation process, 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 is 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 USEPA, and copies of reports, checklists, PowerPoint presentations, and protocols developed by the Tetra Tech team and LFUCG staff.



SPECIALIZED EXPERIENCE WITH THE USEPA STORMWATER PROGRAM

Tetra Tech has provided technical support to USEPA on its municipal stormwater program for many years.

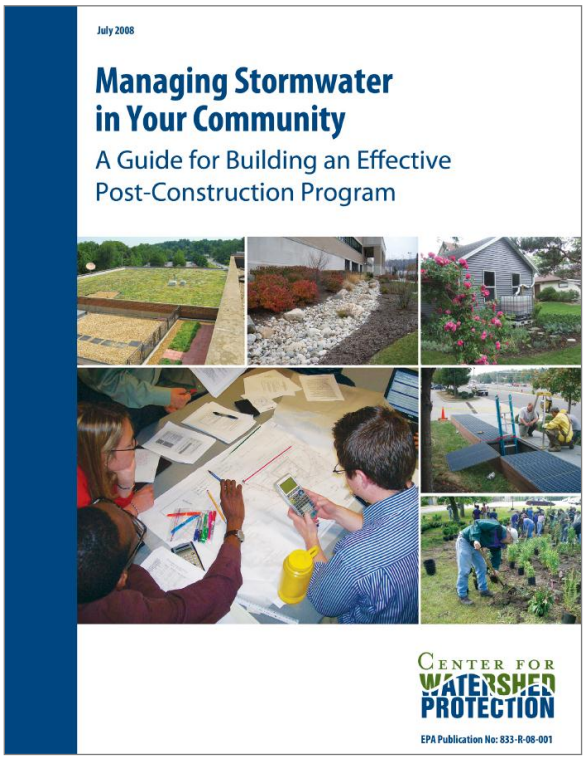
Municipal Stormwater Compliance

Tetra Tech developed for USEPA a *Municipal Separate Storm Sewer System (MS4) Program Evaluation Guidance (Field Test Version)*. This guide describes how a USEPA or state inspector can conduct an MS4 evaluation, and provides guidance on the types of questions to ask for each stormwater program area.

The guide covers pre-evaluation preparation such as evaluation notification procedures, materials to review before the evaluation, and conducting a review of annual reports. The guide also discusses two types of evaluations – a screening-level evaluation and a detailed onsite evaluation. For the chapter on conducting detailed onsite evaluations, Tetra Tech identified the common activities expected to be conducted by an MS4 for each major program area. Tetra Tech then described in the guide the types of questions that should be asked to assess effectiveness and compliance.

USEPA Post-Construction Stormwater Guidance

Under contract to USEPA, Tetra Tech teamed with the Center for Watershed Protection to develop *Managing Stormwater in Your Community: A Guide for Building an Effective Post-Construction Program*. Tetra Tech managed the development of this guidance and was lead author on several chapters. Tetra Tech also provided editing and graphics support to produce the final document. This post-construction guide provides stormwater Phase II MS4s with practical guidance, insights, and tools to build effective post-construction programs. The guide walks a Phase II stormwater program manager through a post-construction program life cycle, including program development, drafting ordinances, plan review, inspections, maintenance, and other key components. The guide includes eight electronic tools that are downloaded separately and helps municipalities implement the program.

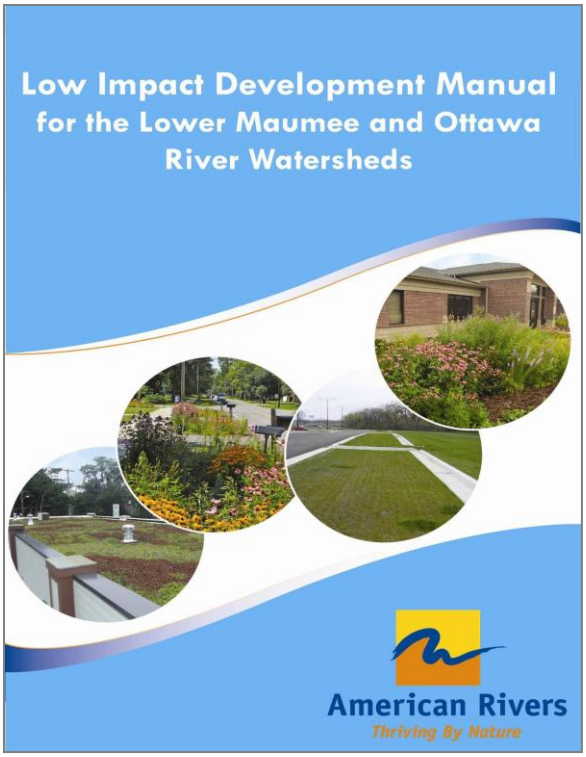


SPECIALIZED EXPERIENCE FOR MUNICIPALITIES

In **Toledo, Ohio**, Tetra Tech developed a Low Impact Development (LID) manual for the American Rivers Organization for the Lower Maumee and Ottawa River Watersheds.

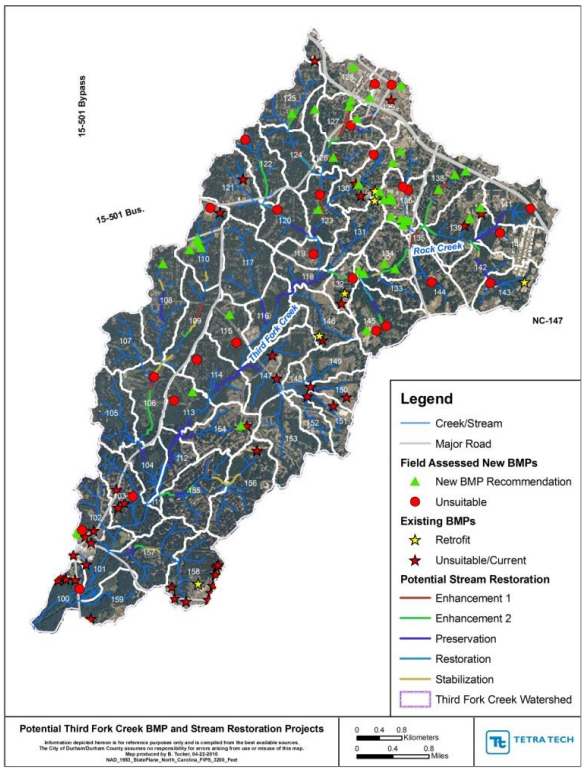
The Lower Maumee River Watershed is the most downstream subwatershed of the Maumee River Basin and thus accepts water from the entire watershed before discharging to Lake Erie. The Ottawa River Watershed is north of the Maumee River Watershed and also drains to Lake Erie. Within the two watersheds, agriculture is the predominant land use, and urban development is occurring in and around the City of Toledo and Lucas County, Ohio.

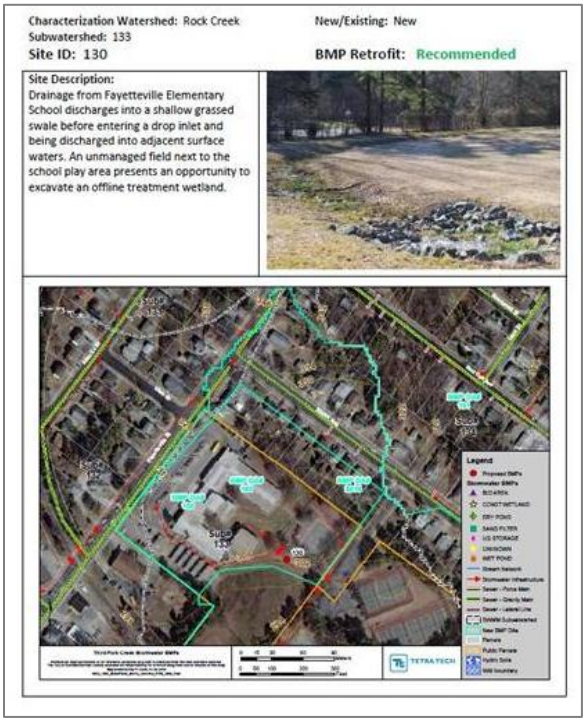
American Rivers received funding for this project from the Joyce Foundation and worked with Tetra Tech to develop the manual. The purpose of this manual is to provide stormwater managers and site designers with a common understanding of LID goals and objectives, site assessment considerations, and a toolbox of stormwater Best Management Practices (BMPs) applicable to the Lower Maumee and Ottawa River watersheds. BMP information includes design guidelines, specifications, details, and maintenance concerns, assistance in selecting the BMPs based upon the characteristics of a particular site. This is a technical manual and the information provided is targeted for engineers, planners, landscape architects, technical staff to policy makers, and developers.



This manual also helps foster a watershed approach to improving water quality within the region. With this understanding, the manual focuses on stormwater BMPs that apply across the two watersheds, ranging from using vegetated buffers in agricultural areas to vegetated roofs in urban areas. The aspiration is to create a user-friendly watershed-wide LID manual to help protect the rivers and streams within the Lower Maumee and Ottawa River watersheds.

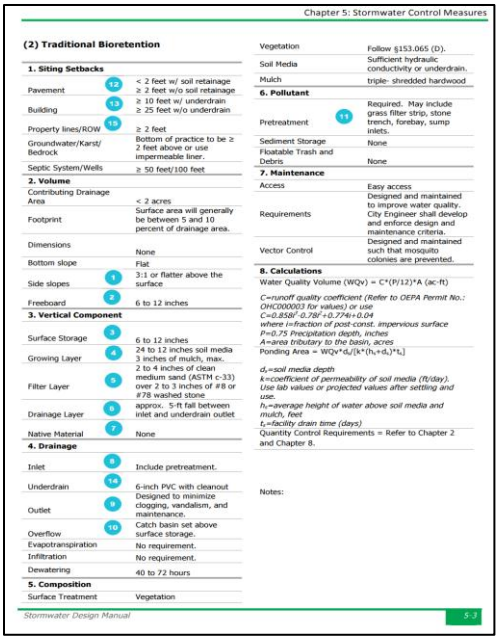
In the **City of Durham, North Carolina**, Tetra Tech conducted a project that involved a stormwater retrofit analysis, which was intended to evaluate existing facilities to determine if other benefits might be obtained through updates or retrofits of the facility. In this way, existing storm ponds, for example, could undergo outlet redesign to improve water quality benefits while continuing to provide their original purpose of flood control. Tetra Tech helped identify opportunities where green infrastructure (GI) could be used in locations for pretreatment and for small storm treatment so that only larger flood events would go into the existing basins.





In **east-central Kentucky**, Tetra Tech developed a Quality Assurance Project Plan, collected existing and new water quality data, implemented an outreach/education program, and worked with a stakeholder group to develop a watershed-based plan addressing EPA's nine key elements for Hinkston Creek, which has been listed as impaired for many years due to poor biological conditions and elevated levels of fecal coliform bacteria, sedimentation, and nutrients linked to low dissolved oxygen (DO) and organic enrichment. The plan, which was approved by the Kentucky Division of Water (KDOW) in June 2011, included detailed cost and load reduction information for a suite of mostly agricultural BMPs, was based upon conventional modeling approaches and innovative analytical tools.

The **City of Dublin, Ohio**, hired Tetra Tech to revise its stormwater design manual to address its new Bridge Street Corridor, form-based development code. The manual was created to provide guidance and policies on effective and preferred stormwater management approaches within the Bridge Street Corridor, which involved managing stormwater runoff from site development, streets and streetscapes (including planned new streets), and open spaces.



Chapter 5: Stormwater Control Measures

(2) Traditional Bioretention

1. Siting Setbacks		
Pavement	12	< 2 feet w/ soil retainage ≥ 2 feet w/o soil retainage
Building	13	≥ 10 feet w/ underdrain ≥ 25 feet w/o underdrain
Property lines/ROW	15	≥ 2 feet
Groundwater/Karst/ Bedrock		Bottom of practice to be ≥ 2 feet above or use impermeable liner.
Septic System/Wells		≥ 50 feet/100 feet
2. Volume		
Contributing Drainage Area		< 2 acres
Footprint		Surface area will generally be between 5 and 10 percent of drainage area.
Dimensions		None
Bottom slope		Flat
Side slopes	1	3:1 or flatter above the surface
Freeboard	2	6 to 12 inches
3. Vertical Component		
Surface Storage	3	6 to 12 inches
Growing Layer	4	24 to 12 inches soil media 3 inches of mulch, max.
Filter Layer	5	2 to 4 inches of clean medium sand (ASTM c-33) over 2 to 3 inches of #8 or #78 washed stone
Drainage Layer	6	approx. 5-ft fall between inlet and underdrain outlet
Native Material	7	None
4. Drainage		
Inlet	8	Include pretreatment.
Underdrain	14	6-inch PVC with cleanout
Outlet	9	Designed to minimize clogging, vandalism, and maintenance.
Overflow	10	Catch basin set above surface storage.
Evapotranspiration		No requirement.
Infiltration		No requirement.
Dewatering		40 to 72 hours
5. Composition		
Surface Treatment		Vegetation
Vegetation		Follow §153.065 (D).
Soil Media		Sufficient hydraulic conductivity or underdrain.
Mulch		triple- shredded hardwood
6. Pollutant		
Pretreatment	11	Required. May include grass filter strip, stone trench, forebay, sump inlets.
Sediment Storage		None
Floatable Trash and Debris		None
7. Maintenance		
Access		Easy access
Requirements		Designed and maintained to improve water quality. City Engineer shall develop and enforce design and maintenance criteria.
Vector Control		Designed and maintained such that mosquito colonies are prevented.

8. Calculations

Water Quality Volume (WQv) = C*(P/12)*A (ac-ft)

C=runoff quality coefficient (Refer to OEPA Permit No.: OHC000003 for values) or use
$C=0.858i^3-0.78i^2+0.774i+0.04$
where i=fraction of post-const. impervious surface
P=0.75 Precipitation depth, inches
A=area tributary to the basin, acres
Ponding Area = WQv*d_s/[k*(h_t+d_s)*t_d]

d_s=soil media depth
k=coefficient of permeability of soil media (ft/day). Use lab values or projected values after settling and use.
h_t=average height of water above soil media and mulch, feet
t_d=facility drain time (days)
Quantity Control Requirements = Refer to Chapter 2 and Chapter 8.

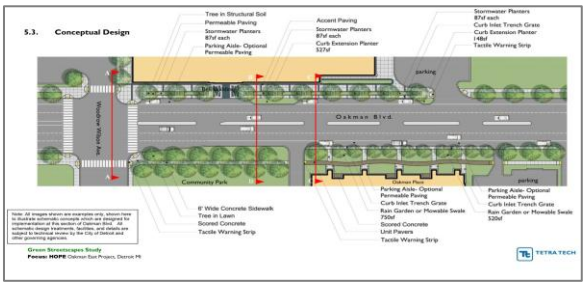
Notes:

Stormwater Design Manual 5-3

In **Lansing, Michigan**, Tetra Tech integrated stormwater quality improvements in an ultra-urban environment. This project demonstrated that stormwater treatment can be designed as an amenity and aesthetic feature for the public to enjoy. The sizing of the streetscape was intended to provide as much opportunity as possible for stormwater to enter bioretention areas within space constraints. Tetra Tech developed an innovative design concept for the bioretention cells to work around underground utilities and allow for curbside parking. This project encompasses four blocks along a very busy five-lane road (Michigan Avenue). The end result is that at least 1 inch of rainfall is treated throughout the entire project, and up to 4 inches of rainfall can be treated in certain component areas.

In **Detroit, Michigan,** the Detroit Water and Sewerage Department (DWSD) and the Michigan Department of Environmental Quality (MDEQ) negotiated a GI program to assist in reducing CSOs to the Rouge River. This program replaced the Upper Rouge Tunnel (URT), proposed at that time.

The GI program is part of DWSD's National Pollutant Discharge Elimination System (NPDES) permit and includes a requirement to invest $15 million in GI from 2013–2017, and a performance expectation of 2.8 million gallons (MG) of stormwater removed from the combined sewer system during a 2-year, 24-hour storm event.

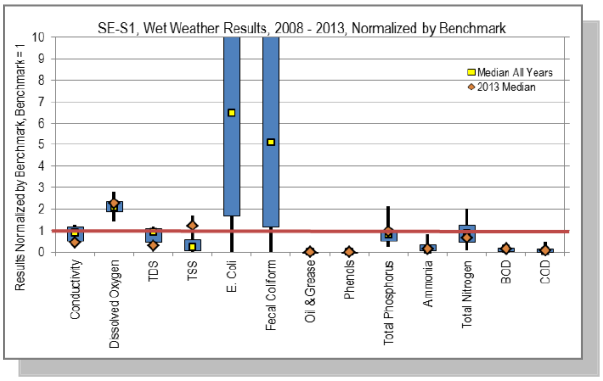


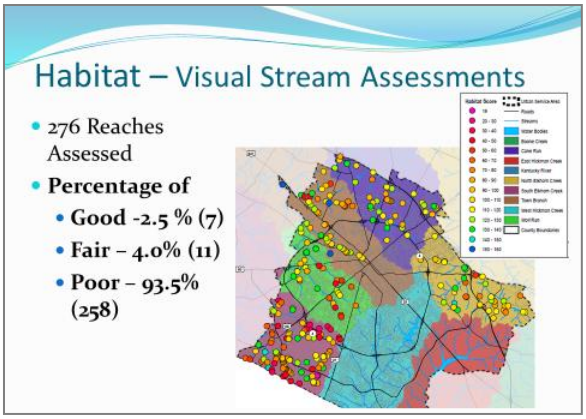
Tetra Tech has been working with DWSD since February 2014 to implement its GI program and NPDES permit requirements. The primary purpose of the program is the reduction of combined sewage flows through stormwater management. The project is being coordinated with DWSD, the City of Detroit, the Southeastern Municipal Council of Governments (SEMCOG), and a wide variety of other institutional partners.

THIRD ROCK CONSULTANTS SPECIALIZED EXPERIENCE

Innovative Data Communication

In addition to collecting and reporting data for Consent Decree / MS4 compliance, our team is experienced with providing innovative data communication to relay important information related to stormwater and stream water quality to public and private stakeholders and watershed councils. We have specialized experience assimilating vast amounts of varied data and presenting it in ways that are valuable to both technical and non-technical audiences, relying on graphical presentations of complex data to make it easier to understand and use. These means have been used in annual reports and in public meetings. An example of innovative data communication implemented by our team was an extensive presentation prepared in June 2014 for the LFUCG Stormwater Stakeholder Advisory Committee (SAC) to provide them with current information on Lexington's monitoring program and the 5-year trend analysis results. This presentation allows stakeholders to focus efforts on the primary sources and causes of impairment.





Our experience includes condensing immense amounts of data and performing appropriate analyses to extract valuable conclusions. Our staff evaluated 15,152 water quality analyses and biological metric scores collected over the past 5 to 10 years to find that water quality has been relatively static with few significant trends. Watershed Fact Sheets have been developed to provide a one-page summary of water quality for each watershed. Our team uses charts, tables, stream hydrographs, box-and-whisker plots, and pollutant load duration curves to demonstrate the scope and nature of quality impacts. Additionally, our team has developed a protocol to characterize overall stream health using a summary status rating of good, fair, poor, or very poor. These summaries allow stakeholders to understand that pathogens are a significant problem throughout the MS4, particularly in wet weather, but contrary to popular understanding, are problematic only regionally, and that metals and numerous other parameters are routinely within acceptable limits. Lack of habitat and increased volume and velocity of stormwater runoff are greater contributors to aquatic life impairments in the area.

Monitoring Program Evaluation

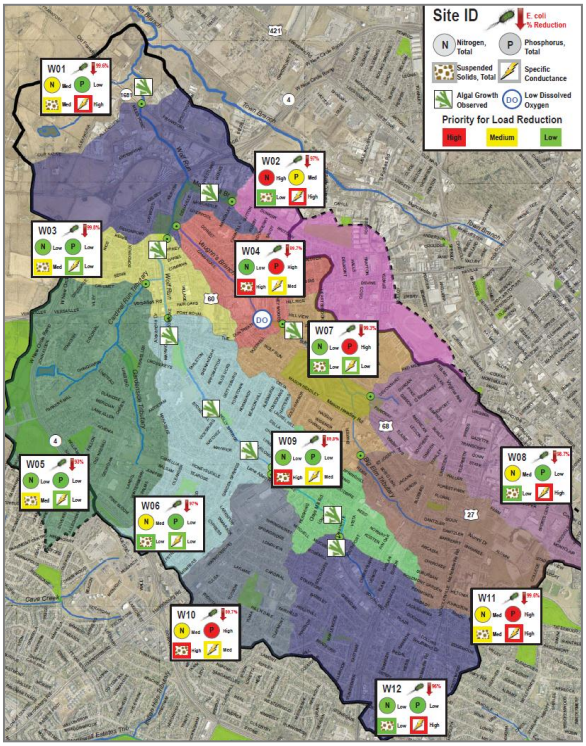
Third Rock Consultants has developed a customized program to evaluate the fitness of the LFUCG MS4 monitoring program so as to meet the goals of the permit and identify water quality problems within MS4 watersheds. Through a combination of this evaluation program and trend analysis of the monitoring results, it was determined that numerous parameters were not providing meaningful data, or were being collected too

frequently. These conclusions were used in negotiations with KDOW to reduce or drop many previously permit required parameters, providing significant cost savings. Additionally, the evaluation showed that to identify priority catchments within each watershed, the type of monitoring and number of locations needed to change into a more dynamic, watershed focused model. These recommendations were also negotiated with KDOW and included in the new permit. Thus, the monitoring program evaluation has resulted in a shift away from parameters and locations that yielded little value to methods and locations that aid in improving water quality.

Integrative Watershed Approach

Professionals within our team have set the standard in Kentucky for watershed planning; our specialized experience with implementing watershed planning using available resources is unparalleled. Third Rock Consultants authored the first comprehensive watershed plan approved in Kentucky for the Laurel / Little Laurel River watershed and has since authored the majority of 319(h) grant–funded watershed plans in Kentucky, including Hanging Fork, Clarks Run, Wolf Run in Lexington, and Chestnut Creek. These watershed plans have been used to develop TMDLs and implementation plans to address loading allocations.

Data and information gathered for Consent Decree / MS4 Permit compliance are valuable and should be used to support overall resource planning in LFUCG's watersheds. Our team's watershed approach uses extensive GIS mapping / analysis to organize and interpret all available data and monitoring results to effectively target and prioritize locations for supplemental environmental projects or BMPs, including stormwater wetlands, bioretention areas, stream and wetland restoration, riparian enhancement, land preservation, public education, and the development of ordinances to guide LID. Through integrative watershed planning, opportunities to achieve layers of use from a project are elucidated allowing us to more effectively achieve desired functions and be good stewards of public monies. For example, a planned sanitary sewer refurbishment project along a stream would combine well with the implementation of riparian enhancement, a greenway / trail system, and other measures to mitigate stormwater runoff and improve stream stability.



Our integrative watershed approach recognizes the need for building partnerships and soliciting stakeholder input. We have effectively engaged and facilitated stakeholder groups associated with the production of many watershed plans. For instance in the Wolf Run Watershed, our scientists identified the causes and sources of impairment in the catchments and then enjoined non-technical citizens and stakeholders in developing a BMP implementation strategy to mark out the best course to address these issues. This plan has already been used to obtain at least $600,000 in additional funding to address impairments. We know that input from all players within LFUCG, other agencies, and the community is key to identifying solutions that take advantage of all resources available and will ultimately improve stream quality.

Third Rock has developed watershed assessments for each of the seven major watersheds that drain the urban service area. These documents bring together all land use and monitoring data for these areas and provide the foundation for the next steps of watershed specific monitoring and implementation planning.

SECTION 3 » DEMONSTRATED CAPACITY OF THE PERSON OR FIRM TO PERFORM THE WORK

OVERVIEW

The Tetra Tech team, comprised of Tetra Tech and Third Rock Consultants, will provide LFUCG with expertise, local knowledge, and staff support necessary to successfully provide the program management services.

Tetra Tech has structured its team to provide locally based staff members who are familiar with LFUCG processes and procedures, and additional specialized staff members to bring you specific expertise that will benefit Lexington as this project is implemented. Doing so provides key benefits to LFUCG: responsiveness and leading-class expertise.

TEAM ORGANIZATION CHART

The following organization chart shows team members who will work on this project. Under the overall task of project management, which will be led by Richard Walker of Tetra Tech, are three main task areas: MS4 permit compliance, SWQMP update, and review of LFUCG's MS4 policies, procedures, ordinances, and guidance documents.

Team members are integrated into project task teams represented by the boxes on the organizational chart. Integration of personnel across firm lines ensures a team approach to problem solving and maximizes the power of the combined knowledge of key personnel. Our companies and staff have worked together on previous projects in Lexington and elsewhere, and are excited to work together again for LFUCG.

The Tetra Tech team blends the talents of both local and national personnel. The team members shown have experience with projects similar to LFUCG's, including projects with tight schedules and budgets.

Lexington-Fayette Urban County Government

Charles Martin, P.E. – Director of Water Quality
Jennifer Carey, P.E. – MS4 Coordinator

Program Manager

Richard Walker, P.E.

MS4 Permit Compliance

Public Education / Involvement: Barry Tonning; Steve Evans (TRC)
Illicit Discharges: Steve Evans (TRC)
Construction Sites: Barry Tonning
Post-Construction: Richard Walker, P.E.
Municipal Operations: Barry Tonning; Jennifer Shelby (TRC)
Industries: Barry Tonning; Gerry Fister, P.G. (TRC)
Water Quality Monitoring: Steve Evans (TRC); Bert Remley (TRC); Cory Bloyd (TRC)

Critical Review of MS4 Policies and Procedures, Ordinances, and Guidance Documents

John Kosco, P.E.

SWQMP Update / Critical Path Scheduling

Barry Tonning
Steve Evans (TRC)

Technical Support

Technical Writing; Reporting; Program Development; Reporting; Workshop Development; Training; Project Website; and Engineering
Herbert Lemaster, P.E.; Daniel Christian, P.E.; Christopher Diehl, P.E.; C. Zachary Wilder, P.E.; Stefanie Farrell, EIT (TRC); Caitlin Fleming, P.E.; Laura Sheeran, EIT; Brian Watson, P.E.

STAFF BIOGRAPHIES

RICHARD WALKER, P.E., CFM (TETRA TECH) – Mr. Walker has 31 years of experience in civil and water resources engineering. He currently manages water resource projects for cities, state governments, and industries, including program management efforts for consent decrees, floodplain analyses, watershed master plans, stormwater utilities, and stormwater Phase I and Phase II permit implementation. He is the MS4 program manager for Lexington.

BARRY TONNING (TETRA TECH) – Mr. Tonning is a senior-level water resource consultant specializing in stormwater management, erosion and sediment control, risk assessment and communication, public health, and technology transfer with extensive experience in training, policy development, and program design. Over the past 25 years, he has directed and managed stormwater and erosion/sediment control training and compliance programs, environmental and natural resource policy research initiatives, nonpoint source pollution assessment and control projects, and watershed planning and management activities. Mr. Tonning has had extensive involvement with LFUCG staff in the development of their Construction Site Runoff Control Program.

STEVE EVANS (THIRD ROCK) – Mr. Evans is an Environmental Scientist for Third Rock. His versatility, innovation, and ability to tailor his biology expertise and capabilities to a variety of applications has allowed him to work in a broad range of environmental projects. He has experience in water quality sampling and analysis, stream and wetland delineation and assessment, ArcGIS and MicroStation mapping software, botanical surveys, NEPA reporting, surface water permitting, invasive control and restoration, and traffic noise assessment. With a laboratory quality assurance background coupled with experience in water quality and biological sampling, Mr. Evans has specialized in watershed planning and analysis. He has developed plans throughout the state of Kentucky including Wolf Run, Hanging Fork, Clarks Run, and Chestnut Creek. In Lexington, he has provided extensive involvement in the development and management of the MS4 monitoring program.

JOHN KOSCO, P.E., CPESC (TETRA TECH) – John Kosco is a national MS4 expert with experience in MS4 permitting, program development, training and inspections/audits. Mr. Kosco 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 on-site 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. Using his MS4 program and audit experience, Mr. Kosco was the lead author of EPA's new guidance document to states on how to write better MS4 permits (EPA's MS4 Permit Improvement Guide, 2010).

GERRY FISTER, P.G. (THIRD ROCK) – Mr. Fister is an Environmental Planner for Third Rock and supports projects with his background in geological sciences and his experience in industrial pretreatment program management. Gerry has provided stormwater quality support for municipalities and industry through the development of groundwater protection plans, spill prevention, control and countermeasures plans and responding to spills and other incidents that impact water quality. Gerry's has an extensive understanding of the regulations governing environmental quality and permitting. His knowledge of a wide range of regulatory programs, and a broad background in the application of environmental science make him a valuable asset to Third Rock's clients. Gerry also supports projects that have a groundwater quality component, particularly with Lexington local karst groundwater considerations, Gerry's insights can be important to

the successful understanding of surface water quality.

JENNIFER SHELBY, P.E., CPESC (THIRD ROCK) – Ms. Shelby has dedicated her career to the enhancement of environmental quality, including nonpoint source pollution and stormwater management, watershed-scale assessment of hydrology and water-quality, green stormwater infrastructure planning and design, environmental permitting, and stream and wetland restoration. Having worked in Kentucky, Tennessee, and North Carolina, she is experienced with developing and implementing watershed monitoring schemes and assessing the data produced, as well as designing and constructing large-scale stream and wetland restorations. Her role as a water resources engineer also includes management of environmental projects.

BERT REMLEY (THIRD ROCK) – Mr. Remley has been sampling streams in Fayette County each year since 1998. He is Third Rock's senior aquatic biologist and is the Quality Control/Quality Assurance Officer for Third Rock's aquatic biology laboratory. In addition to macroinvertebrate taxonomy, Bert also conducts stream sampling for aquatic macroinvertebrates, fish, plankton, and freshwater mussels. He is experienced in the identification and ecology of aquatic macroinvertebrates and fish of the region, conducting surveys in Kentucky, Ohio, Indiana, Illinois, Tennessee, West Virginia, Virginia, South Carolina, and North Carolina. Mr. Remley has also conducted hundreds of biological assessment for threatened and endangered species in Kentucky and Tennessee including numerous bat, fish, and mussel species. Bert holds certifications from the Society for Freshwater Science to identify macroinvertebrates, and is certified by the Ohio Environmental Protection Agency to collect, identify and data evaluation of macroinvertebrates. As a PADI-certified open water diver and part of Third Rock's dive team, he has led numerous mussel surveys.

DANIEL CHRISTIAN, P.E., D.WRE (TETRA TECH) – Mr. Christian's expertise includes hydraulics, hydrology, computer modeling, stormwater management and permitting, low impact development design, master plans, database programming, water quantity and quality monitoring, rate development, project development, and project management. He has worked on a wide variety of projects including NPDES permitting, watershed management, hydrologic/hydraulic studies, and a variety of design and construction projects. For several years, Mr. Christian has performed as Project Manager for the study, design, construction, and monitoring of green infrastructure projects. He has prepared numerous studies and designs for a wide variety of best management practices (rain gardens, bioretention, infiltration, porous pavement, water conservation, etc.). This work often involves green infrastructure in roadway corridors as well as site developments. Mr. Christian was the project manager and lead hydraulic engineer of a project in Milwaukee to conduct an alternatives analysis of ways to mitigate surface flooding. He also has extensive experience as a workshop presenter for the EPA.

HERBERT LEMASTER, P.E. (TETRA TECH) – Mr. Lemaster is a senior designer in the Lexington office. He has an extensive background in project analysis and design, writing specifications, developing contract documents and cost estimates, preparation of construction drawings, construction administration, and construction engineering. Mr. Lemaster serves as a project manager and engineer on various civil and environmental projects. He has worked on many stormwater projects, including stormwater retention basins, evaluations of stormwater facilities, and stormwater modeling.

CHRISTOPHER DIEHL, P.E. (TETRA TECH) – Mr. Diehl has served as an engineer on hydraulic modeling projects and sanitary sewer rehabilitation projects. He has experience in data collection, data analysis, pipe system capacity analysis, modeling sewer systems and open channels, and sanitary sewer design. He is experienced in using hydrologic / hydraulic modeling software and GIS software, including HEC-RAS, HEC-GeoRAS, xpswmm, InfoWorks, AutoCAD, and ArcGIS. He has experience in floodplain and floodway modeling, mapping, and permitting projects around Kentucky.

STEFANIE FARRELL, EIT (THIRD ROCK) – Ms. Farrell has 9 years of experience as a utility engineer. In that role, she gained an understanding of the complex roles that utility managers play balancing

water quality and providing customer service. Subsequently, as an employee for the Tennessee Department of Environment and Conservation (TDEC) in the Watershed Management Division, Ms. Farrell focused on broadening her perspectives to include multiple watersheds with a wide variety of pollutants. She performed environmental assessments aimed at evaluating load and waste load allocations from pollution sources. She provided technical guidance regarding nonpoint source impacts and mitigation efforts such as streamside buffers, vegetative and structural best management practices, planning techniques and ordinances in the study area. Her expertise, coupled with associated modeling efforts, has resulted in TMDLs and associated NPDES permits requirements to protect water quality. Most recently, Ms. Farrell has joined the engineering consulting field and is aggressive about applying her knowledge and skills to benefit her clientele. Her daily duties involve assisting municipalities with the technicalities of program management and permit compliance.

CORY BLOYD, CPESC (THIRD ROCK) – Mr. Bloyd is an Environmental Technician involved in a broad spectrum of projects at Third Rock that combine his expertise in environmental science, geographic information systems, hazardous materials, and environmental construction. He routinely conducts surveying for aquatic and terrestrial species, including those listed as threatened and endangered, and is a PADI-certified Open Water and Nitrox Certified Diver. He plays an integral role in Third Rock's water quality studies, having served as the field team leader for a large, multi-county study from 2006 to 2008 and is currently serving as field team leader on an ongoing study in Lexington. Mr. Bloyd is a Qualified Erosion Prevention and Sediment Control Inspector for Kentucky, Tennessee, and Louisville MSD and is currently serving as the lead EPSC inspector for the ongoing downtown crossing of the larger Ohio River bridges project.

BRIAN WATSON, P.E., P.H. (TETRA TECH) – Mr. Watson is a senior civil engineer specializing in environmental engineering and water resources engineering, including hydrodynamic and water quality modeling, TMDL development and implementation, and water resources planning. He has experience with numerous watershed, groundwater, hydraulic, hydrologic, hydrodynamic, and water quality models, and has worked on a variety of Total Maximum Daily Load (TMDL) projects around the country, including assisting several states (GA, FL, TN, AL, SC, and CA) with meeting TMDL consent decree requirements. Mr. Watson has worked for various clients, including USEPA (Headquarters, Region II, Region IV, Region IX, and Region X), US Army Corps of Engineers (Jacksonville, Mobile, and Savannah Districts), US Air Force (ACC, AETC, AFMC, and Space Command), NASA, Tennessee Valley Authority (TVA), GAEPD, ADEM, TDEC, FDEP, and local governments and municipalities.

CAITLIN FLEMING, P.E. (TETRA TECH) – Ms. Fleming provides engineering and technical support by developing and implementing environmental compliance projects for private, commercial, municipal, and government clients. This work includes air, water, and waste permitting; environmental impact assessment studies; spill response plans including SPCC, BMP, GPP, ERP; OSHA Process Hazard Analysis and EPA Risk Management Planning and associated PHAs (for four municipal wastewater plants and a large chemical processing plant); OSHA and EPA compliance audits; data analysis and emissions evaluations for multiple location facilities under a major national environmental contract; and project report technical quality control reviews.

C. ZACHARY WILDER, P.E. (TETRA TECH) – Mr. Wilder provides civil engineering and geotechnical engineering support to a wide variety of projects, including landfills, site development, and roadway projects. He is a qualified erosion and sediment control inspector in Kentucky (KEPSC).

LAURA SHEERAN, EIT (TETRA TECH) – Ms. Sheeran provides civil engineering and structural engineering support to a wide variety of projects at Tetra Tech, including water, wastewater, stormwater, and landfill projects. She is currently serving as a project engineer on the LFUCG Walhampton stormwater project and the Wolf Run Wet Weather Storage Facility. She is a qualified erosion and sediment control inspector in Kentucky (KEPSC).

STAFF CREDENTIALS

The following table outlines key staff members' professional credentials.

Staff Member	Credentials
Richard Walker, P.E., CFM	• Bachelor of Science in Agricultural Engineering • Master of Civil Engineering (Water Resources) • Professional Engineer, Kentucky • Certified Floodplain Manager • Qualified Inspector, Kentucky Erosion Prevention and Sediment Control
John Kosco, P.E., CPESC	• Bachelor of Science, Agricultural Engineering • Master of Science, Civil / Water Resources Engineering • Certified Professional in Erosion and Sediment Control
Barry Tonning	• Bachelor of Arts in Journalism • Master of Arts, Env. Risk Communication • Certified Erosion, Sediment, and Storm Water Inspector • Qualified Erosion and Sediment Control Inspector (Kentucky, GA Soil & Water Conservation Commission, Louisville MSD) • Kentucky Division of Water Class I Wastewater Treatment Plant Operator
Gerry Fister, P.G.	• Bachelor of Science in Geology • Professional Geologist
Steve Evans	• Bachelor of Science in Biology • Master of Arts in Education • LFUCG Training Instructor for Water Quality Sampling, 2012–2014

Bert Remley	• Bachelor of Arts in Anthropology, Minor in Biology
	• Master of Science in Biology
	• Society of Freshwater Science certifications:
	  ○ Identification of Eastern Chironomidae (Midges), 2005–2016
	  ○ Identification of Eastern Ephemeroptera (Mayflies), Plecoptera (Stoneflies), and Trichoptera (Caddisflies), 2005–2016
	  ○ Identification of Eastern General Arthropod, 2014–2019
	• Ohio EPA Level 3 Qualified Data Collector for Benthic Macroinvertebrate Assessment – Sample Collection, Identification, and Data Evaluation

Jennifer Shelby, P.E., CPESC	• Bachelor of Science in Biosystems and Agricultural Engineering • Master of Science in Biological Engineering • Professional Engineer, Kentucky • Certified Professional in Erosion and Sediment Control • Levels I-IV of Rosgen Stream Restoration Training • Stream Restoration Design Training (Canadian Rivers Institute)

STAFFING INFORMATION AND AVAILABILITY

A Staffing Information and Availability table follows. Actual time commitment to the project will depend upon the final project scope and schedule. We are committed to providing focused staff to lead the project, supported by best-in-class technical experts, to deliver the best solutions to LFUCG.

Staffing Information and Availability Table

Team Member*	Firm	Team Role	% of Time Available for Project	Experience Areas	Highlights	Years of Experience	Location
Richard Walker	Tetra Tech	Project Manager	50%	Program Management, Consent Decree and MS4 Permit Implementation	Current MS4 Program Manager for Lexington; primary author of Lexington's Stormwater Manual	30	Lexington
Barry Tonning	Tetra Tech	Policy Analyst	50%	Construction Site BMPs, Training, Public Involvement	Key staff member on implementing the MS4 permit for construction site runoff issues	28	Lexington / Mt. Sterling
Laura Sheeran	Tetra Tech	Project Engineer	30%	Stormwater engineering design and construction	Project engineer on Walhampton	3	Lexington
Steve Evans	Third Rock	Environmental Scientist	70%	Data Evaluation, Statistical Analysis	Evaluates, interprets monitoring data to detect trends	13	Lexington
Christopher Diehl	Tetra Tech	Project Engineer	50%	Hydrology, hydraulics, floodplain mapping	Modeler for Vaughns Branch / Sugarmill and Danby Corners LOMR	10	Louisville
Shann Easterling	Tetra Tech	Senior Technician	30%	Water Quality Monitoring	Provides field support	15	Lexington
Jennifer Shelby	Third Rock	Project Engineer	50%	Watershed Assessments	Developed protocol for evaluating Lexington data	15	Lexington
Bert Remley	Third Rock	Environmental Scientist	50%	Water Quality Monitoring	Directs field work for Lexington monitoring	20	Lexington
Cory Bloyd	Third Rock	Environmental Scientist	50%	Water Quality Monitoring	Directs field work for Lexington monitoring	9	Lexington

* Indicates a personal team role greater than 10% of the total project effort.

SECTION 4 » CHARACTER, INTEGRITY, REPUTATION, AND EFFICIENCY OF THE PERSON OR FIRM

OVERVIEW

Since inception in 1966, Tetra Tech has earned a strong national reputation. Because of our emphasis on character, we have been able to attract leading professionals who are known for their expert judgment, experience, and efficiency. These professionals have worked in both private and governmental positions.

In addition, during nearly three decades of serving the Lexington area, Tetra Tech has worked alongside LFUCG personnel on numerous projects, work that has given us the local experience and judgment to provide quality services.

Our performance as the current MS4 Program Manager for LFUCG is a testament to our reputation of character and integrity. We have been successful at creating an atmosphere of trust and respect with the many agencies within LFUCG: Water Quality, Environmental Policy, Engineering, Planning, Law, and others. We have delivered high-quality products on time and within budget, and in a spirit of teamwork with LFUCG staff. As a result, LFUCG has met all the deadlines in the Consent Decree and MS4 permit and has developed a reputation in the community of improving the quality of life in Lexington.

THE QUALITIES YOU SEEK

The characteristics that you seek in a firm are embodied in our people and in the way we approach projects:

- **Character and Integrity** – These qualities are demonstrated by the staff that represents Tetra Tech to our clients. We recognize the essential need to earn the trust of the many stakeholders that will be involved in a project of this magnitude.
- **Reputation** – Tetra Tech's reputation in Lexington is one of providing a high level of service to LFUCG. We do this while collaborating with your staff and other team members to ensure your goals are met.
- **Judgment** – Judgment involves asking the question "What is important?" We believe in the course of this work that what is important is not only what will happen in the near term, but also in the long term. With this perspective, we can weigh options and evaluate solutions with a broader base of decision making.
- **Experience** – We have designed our team to provide Lexington with the best local capability along with the experience that we have developed in multiple programs throughout the country. Our goal is to build upon the depth of experience in the MS4 program while bringing you tools that have been developed in other communities.
- **Efficiency** – Efficiency in professional services means "hitting the ground running." Because of past experience, there will no learning curve for our staff. We understand the project and your objectives.

SOCIAL RESPONSIBILITY

At Tetra Tech, we seek clear sustainable solutions that improve the quality of life. We take this responsibility seriously because Tetra Tech's work often places us at the center of our clients'

challenges regarding environment, safety, and sustainability. These challenges often involve the opinions of many stakeholder groups from the public, industry, and government who seek Tetra Tech's advice on complex issues. To provide solutions to these challenges, we believe in maintaining our technical objectivity, and as a policy, we do not own individual technologies.

We have earned our reputation for technical objectivity over the last four decades. We have helped thousands of towns, cities, industries, and governments find sustainable solutions to complex issues concerning resource management and infrastructure. We have designed progressive "green" buildings in New York City, helped the Department of Defense with pollution prevention and clean-up, and helped many Fortune 500 companies balance environmental needs with business goals. Tetra Tech companies hold memberships with the US Green Building Council, the Chicago Climate Exchange, and the Environmental Protection Agency's (EPA) Climate Leaders.

We also encourage our professionals to participate in outreach programs. Tetra Tech associates and offices participate in many non-profit agencies and projects within their local communities. As a sponsor of the non-profit humanitarian organization Engineers without Borders–USA, Tetra Tech is committed to providing sustainable water, transportation, and housing systems to the developing communities that need them most.

REFERENCES

The following references can attest to our character and reputation.

Mr. Brad Frazier, P.E.
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Mr. Gregory S. Lubeck, P.E., CFM
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Mr. Mark Day, P.E., AAE
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Mr. Steve Bourne
Hopkinsville Surface and Stormwater Utility
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sbourne@comdev-services.com

THIRD ROCK CONSULTANTS

Overview

Third Rock is recognized as a leading environmental firm in our region, achieving this distinction through a combination of superior technical skills and commitment to meeting clients' needs. Their services have long included environmental engineering design, biological and ecological analyses, environmental permitting and mitigation, and NEPA documentation. Third Rock serves a wide range of private and public clients, including industry and government agencies, who are faced with challenges that demand environmental experience and technical expertise.

Third Rock has achieved a reputation for providing quality environmental services in today's challenging regulatory climate for several reasons:

Unparalleled Environmental Expertise and Years of Experience

Third Rock's clients benefit from the extensive knowledge and experience of their professional staff. They take pride in their multidisciplinary team of environmental professionals, including several recognized experts. These experts are not just names on a resume but are in the field bringing a long history of observation of Lexington's streams to each monitoring event and assessment.

Outstanding Resources

Third Rock specializes exclusively in environmental consulting, and has the capability, capacity, and proven track record to successfully complete the most complex projects. Third Rock has a history of successful projects and satisfied clients in numerous states. With a full-time staff of just 21, they have completed multi-million dollar projects on schedule and produce high-quality deliverables. They are able to do this because of a progressive and straightforward organization structure and a hands-on-owner who personally schedules personnel time and manages project deadlines. Their professional staff is supported by an experienced team of environmental technicians, technical writers, GIS analysts; state-of-the-art equipment, hardware, and software; a fully trained and equipped dive team; and a state-of-the-art in-house aquatic biological laboratory. These resources have allowed Third Rock to readily expand its scope to serve your staff in accomplishing the program objectives.

Corporate Priorities

Third Rock actively perpetuates a corporate culture of integrity, innovation, continued learning, and efficiency. Ethical business practices and consulting approaches are of utmost importance at Third Rock. Innovation also plays a critical role in the firm, and they specialize in applying innovative, cost-effective approaches to projects. We believe the public is best served by increasing the internal capacity of LFUCG's staff and cutting or modifying programs that no longer serve the public's best interest.

SECTION 5 » PAST RECORD AND PERFORMANCE

OVERVIEW

This section provides an overview of similar stormwater projects performed by the Tetra Tech team for LFUCG and other clients. Similarities among these projects are highlighted in matrix format, showing the relationship among the current scope and these projects.

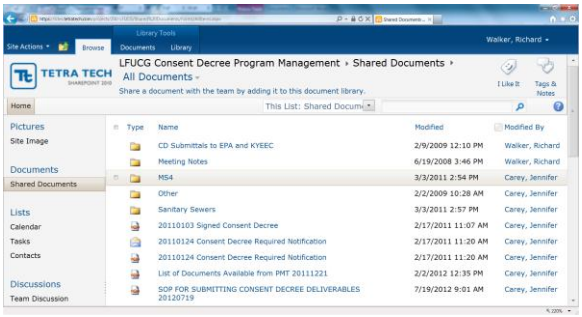
PROJECT HISTORY WITH LFUCG

The Tetra Tech team has enjoyed a 30-year working relationship with LFUCG. Following is a partial listing of current and completed stormwater-related projects, performed on schedule and within budget for the LFUCG. As part of these programs, the quality of work, control of costs, and ability to meet schedules has been maintained. For example, under the current MS4 program management contract for LFUCG, we have worked in a collaborative manner with your staff to ensure completion of MS4 permit milestones on time and in a cost-effective manner.

Through the work completed to date, the products Tetra Tech has produced have met with the approval of LFUCG staff and the public has been supportive of the program:

- MS4 Annual Program Management Services
- Development of the Stormwater Quality Management Program (SWQMP) as part of the EPA Consent Decree Negotiations
- Stormwater Manual
- Vaughns Branch / Sugar Mill Flood Mitigation
- Danby Corners FEMA Letter of Map Revision
- Expansion Area 2 Stormwater Master Plan
- Southland Drive Drainage Study
- North Elkhorn Hydrologic and Hydraulic Model
- Town Branch Hydrologic and Hydraulic Model
- Detention Basin Maintenance Program
- MS4 Permit Stormwater Monitoring.

SIMILAR PROJECTS



The following similar projects are a sampling of relevant MS4 and stormwater projects our team has completed within the last 10 years. We have completed many more projects of similar and greater scope and can provide any additional details upon request.

Each project description in this section includes the name of the client organization and name and information for a person there to contact for a reference. Each can speak to the Tetra Tech team's quality of work; completeness of work; accuracy of services; success in controlling costs; success in maintaining schedules and meeting deadlines; and responsiveness to staff comments.

Tetra Tech Team – Representative Project Experience Table

Project Name	Program Management	Technical Writing	USEPA Reports	Ordinance and Policy Development	Training and Workshops	Water Quality Monitoring	Project Database	Critical Path Scheduling	Technical Support
Municipal Separate Storm Sewer System (MS4) Annual Program Management Services, Lexington, KY	●	●	●	●	●	●	●	●	●
MS4 Permit Improvement Guide, United States	●	●	●		●		●		●
MS4 Program Evaluation Guide, United States	●	●	●		●		●		●
Stormwater Manual for New Development, Fayette County, KY	●	●		●	●				●
Post-Construction Stormwater Guidance, United States	●	●		●	●				●
Stormwater Design Manual, Dublin, OH		●		●	●				●
CSO Green Infrastructure Program (CS 1522), Detroit, MI	●	●		●	●		●	●	●
Hinkston Creek Watershed Plan and BMP Cost-Share, East-Central, KY	●	●			●	●	●		●
Floyds Fork Watershed Water Quality Model Development, KY		●	●		●		●		●
Third Fork Creek Watershed Plan and General Program Support, Durham, NC	●	●		●	●				
Support for Chesapeake Bay TMDL Watershed Implementation Plan Development	●	●			●		●		●
LID Manual for the Lower Maumee and Ottawa River Watersheds, Toledo, OH		●			●				

Project Name	Program Management	Technical Writing	USEPA Reports	Ordinance and Policy Development	Training and Workshops	Water Quality Monitoring	Project Database	Critical Path Scheduling	Technical Support
NPDES Stormwater Phase II Program Support, MN	●	●			●				●
Watershed Plan Development and Water Quality Improvement Projects / Award and Utilization of 319(h) Grant Funding, Corbin City Reservoir / Laurel River Watershed, KY	●	●			●	●	●	●	●
Dix River Watershed Plan Development, Clark, Boyle, and Rockcastle Counties, KY	●	●			●	●	●	●	●
Consent Decree and MS4 Permit Monitoring, Lexington, KY	●	●	●		●	●	●	●	●
Stream Restoration Inspection and Maintenance, Louisville, KY	●	●			●	●			●
Wolf Run Watershed Plan Development, Lexington, KY	●	●			●	●	●	●	●

REPRESENTATIVE PROJECT EXPERIENCE

Municipal Separate Storm Sewer System (MS4) Annual Program Management Services, Lexington, KY

PROJECT HIGHLIGHTS: Annual Program Management; MS4 Permit Compliance and Permit Renewal; Water Quality Management Fee; Erosion and Sediment Control; Low Impact Development – Green Infrastructure; Post-Construction Stormwater Standards; Water Quality Monitoring

PROJECT DURATION: Ongoing since 2008

PROJECT STAFF: Richard Walker, P.E., Program Manager; Jennifer Carey, P.E., Project Engineer; Barry Tonning, Senior Policy Analyst; John Kosco, P.E., Senior Engineer

REFERENCE: Lexington-Fayette Urban County Government; Charles H. Martin, P.E.; Director, Division of Water Quality; (859) 425-2400; chmartin@lexingtonky.gov

Tetra Tech has been providing MS4 annual program management services since 2008 for implementing Lexington's EPA Consent Decree and the MS4 permit issued by the Commonwealth of Kentucky. During that time, the Tetra Tech/LFUCG team has achieved compliance with all aspects of the MS4 program as evidenced by the following:

- All 153 MS4 permit requirements have been met, along with 167 measurable goals in LFUCG's Stormwater Quality Management Program
- All 40 stormwater performance standards in the Consent Decree have been met
- The Kentucky Division of Water inspected LFUCG's MS4 program in 2010 and 2012 found no deficiencies.

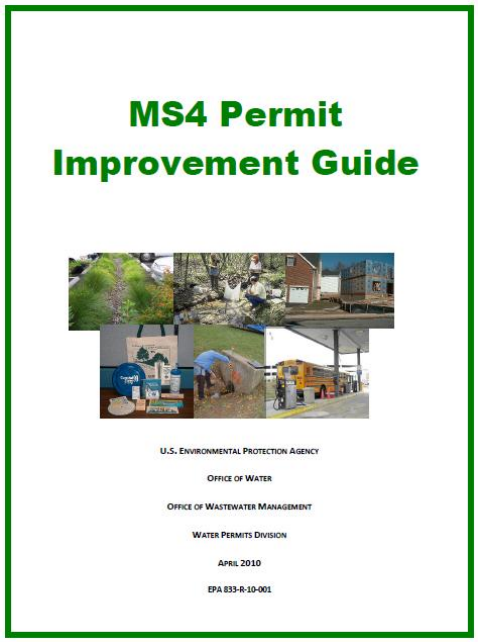
The work performed by Tetra Tech has included the following:

- Preparing the application for the 2014 MS4 permit renewal and assisting LFUCG management in the permit negotiations with the Kentucky Division of Water
- Planning and preparing the necessary documentation for MS4 compliance inspections by the Kentucky Division of Water in 2010 and 2012
- Developing the MS4 Stormwater Quality Management Program, including sections on public education / involvement, illicit discharges, construction site runoff, industrial runoff, water quality monitoring, municipal operations, and post construction
- Providing project management and technical support for implementing the water quality management fee in 2010 that generates approximately $11,000,000 per year
- Conducting training for LFUCG staff on illicit discharge elimination and construction site inspections
- Developing an inventory of industrial facilities and high-risk commercial facilities
- Developing new ordinances for the industrial stormwater discharge program, maintenance of stormwater controls on private property, and erosion control
- Developing an enforcement response plan for construction sites and industrial facilities
- Developing stormwater pollution prevention plans for two wastewater treatment plants
- Developing and implementing the water quality monitoring program, consisting of fish and macroinvertebrates, surface water collection and analysis during dry weather and after rain events, and habitat evaluations

- Maintaining a SharePoint site of Consent Decree and MS4 Permit deliverables for access by LFUCG staff
- Developing Low Impact Development (Green Infrastructure) Guidelines for design and construction
- Planning and coordinating the quarterly meetings with the citizen Stormwater Stakeholder Advisory Committee
- Evaluating the effectiveness of the city's post-construction stormwater management standards for new development and redevelopment
- Developing a Stormwater Management Plan Executive Summary checklist that allows staff to quickly determine if the proposed stormwater controls meet the water quantity and water quality requirements of the LFUCG Stormwater Manual
- Conducting monthly coordination meetings with city staff to review deadlines and work completed on MS4 Permit and Consent Decree requirements
- Conducting monthly coordination meetings with three different divisions to resolve issues related to the permitting, inspection, and enforcement of erosion and sediment control BMPs
- Conducting an annual workshop with over 120 construction industry representatives on erosion and sediment control
- Conducting audit inspections of over 50 construction sites
- Attending pre-bid and pre-construction meetings on capital projects and making presentations on the permitting, inspection, and enforcement procedures
- Conducting watershed assessment on the major watersheds in Fayette County
- Conducting an audit of the MS4 program in 2014 to identify areas that need improvement
- Preparing the MS4 annual report.

MS4 Permit Improvement Guide, United States

PROJECT DURATION: October 2008 – April 2010
REFERENCE: U.S. Environmental Protection Agency; Rachel Herbert; 202.564.2649



For EPA Headquarters, Tetra Tech developed an MS4 Permit Improvement Guide to assist State and EPA Regional MS4 permit writers in developing stronger MS4 permits. Tetra Tech began by identifying examples of effective MS4 permit language from over 20 different Phase I and Phase II MS4 permits. Tetra Tech then worked closely with EPA workgroups to develop model permit language for each of the eight main components typically addressed in MS4 permits:

- Stormwater Program Management
- Public Education and Outreach/Public Involvement
- Illicit Discharge Detection and Elimination
- Construction
- Post-Construction or Permanent/Long-Term Stormwater Control Measures
- Pollution Prevention/Good Housekeeping
- Industrial Stormwater Sources
- Monitoring, Evaluation, and Reporting.

Tetra Tech drafted the guide to include examples of permit conditions and supporting rationale that could be used in NPDES permits. Tetra Tech also developed guidance for the permit writers to explain why certain provisions were included, and how they can customize the provision to meet their unique needs. This guidance for the permit writer also included additional resources and information to help support their MS4 permit.

Each chapter of the guide includes information about the existing legal authority that allows the permit writer to include that requirement, and the model permit language includes placeholders for relevant information that should be inserted by the permit writer (such as deadlines or frequency of required actions).

The guide also includes an annual report template that permit writers can use, and a detailed section of definitions.

MS4 Program Evaluation Guide, United States

PROJECT HIGHLIGHTS: Developed a guide on conducting MS4 evaluations, including questions to ask to assess effectiveness and compliance; guide provides detailed evaluation worksheets; prepared materials for and conducted training via webcast and 2-day training class attended by state and U.S. EPA staff.
PROJECT DURATION: January 2005 – October 2007
PROJECT STAFF: John Kosco, P.E., CPESC; Martina Frey; Christy Williams
REFERENCE: U.S. Environmental Protection Agency; Jenny Molloy; molly.jennifer@epa.gov

Tetra Tech developed for EPA a Municipal Separate Storm Sewer System (MS4) Program Evaluation Guidance (Field Test Version). This guide describes how an EPA or state inspector can conduct an MS4 evaluation, and provides guidance on the types of questions to ask for each stormwater program area.

The guide covers pre-evaluation preparation such as evaluation notification procedures, materials to review before the evaluation, and conducting a review of annual reports. The guide also discusses two types of evaluations: a screening-level evaluation and a detailed onsite evaluation. For the chapter on conducting detailed onsite evaluations, Tetra Tech identified the common activities expected to be conducted by an MS4 for each major program area. Tetra Tech then described in the guide the types of questions that an evaluation should ask to assess effectiveness and compliance.

The guide included a detailed set of program evaluation worksheets (Appendix B) and field inspection worksheets (Appendix C) to assist state or EPA staff in conducting an evaluation. The worksheets can be completed during the evaluation to ensure that all relevant topics are addressed.

To train state and EPA staff, Tetra Tech assisted EPA in holding a 2-hour webcast on March 7, 2007 that described key aspects of the MS4 Program Evaluation Guidance. John Kosco of Tetra Tech was the primary speaker, and an estimated 2,000 people participated in this webcast. An archived copy of this webcast is available at http://goo.gl/aIhFJ.

Tetra Tech also developed a set of training materials for a 2-day class with the purpose of educating EPA and state inspection staff on how to conduct an MS4 evaluation. Tetra Tech has trained EPA staff and state staff from California, Hawaii, and Texas on how to conduct MS4 evaluations.

Stormwater Manual for New Development, Fayette County, KY

PROJECT HIGHLIGHTS: Guide for the design of the storm drainage infrastructure for Lexington-Fayette County; design standards for stormwater quality and quantity; erosion and sediment control regulations
PROJECT COMPLETION: 2001
PROJECT STAFF: Richard Walker, P.E., Project Manager
REFERENCE: Mr. Brad Frazier, P.E., (859) 258-3410; Lexington-Fayette Urban County Government; 101 East Vine Street; Lexington, KY 40507

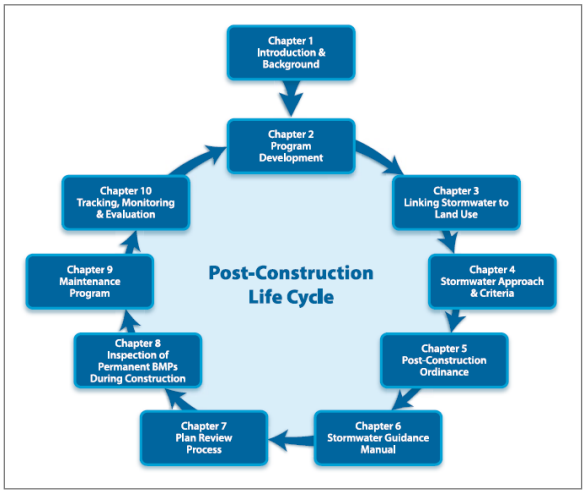
Tetra Tech was selected by the Lexington-Fayette Urban County Government (LFUCG) to prepare a Stormwater Manual for the design and construction of stormwater facilities in new development. To build consensus on the major issues, many meetings were held with neighborhood groups, private engineers, developers, homebuilders, and LFUCG staff.

The manual was adopted by the LFUCG on January 1, 2001, and serves as the guide for designing storm drainage infrastructure for stormwater quality and quantity. The manual contains new development requirements for floodplain management, stream buffers, flood control, and water quality protection. It contains design criteria and design procedures for inlets, storm sewers, culverts, channels, and best management practices, including erosion and sediment control. To provide additional flood protection, new structures are required to be 25 feet from the floodplain, and the lowest opening to the structure is required to be 2 feet above the 100-year floodplain elevation. New detention basins in residential areas will be on a separate lot and will be owned, operated, and maintained by the government.

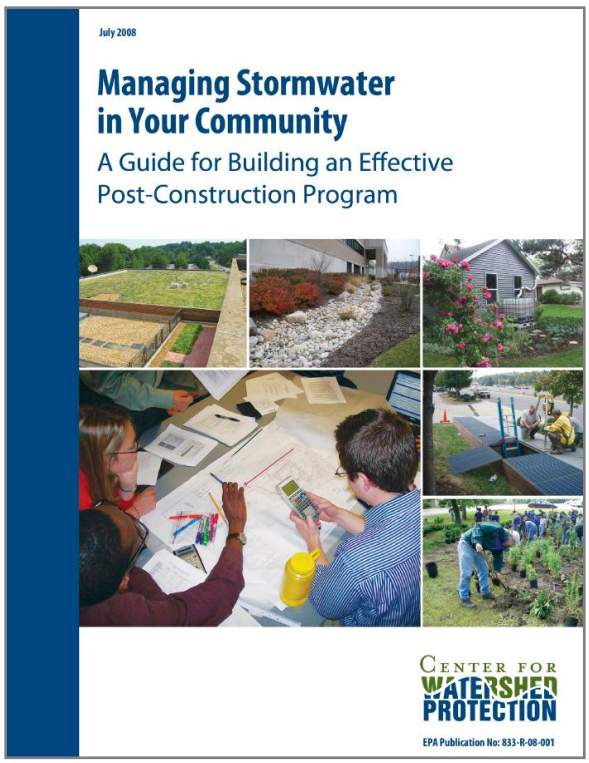
Design criteria are given for bioretention systems; infiltration systems such as modular pavement, swales, infiltration basins, and vegetated filter strips; detention ponds; extended detention ponds; wet ponds; and constructed wetlands. The manual also includes significant incentives for developers to establish riparian buffer zones along streams. Bioengineering principles are emphasized in lieu of the traditional concrete and riprap solutions to streambank stabilization.

Developers will also have to comply with new erosion and sediment control requirements, such as no construction in floodplains; a maximum exposure time for disturbed areas; limits on maximum disturbed areas; BMPs for erosion control; and BMPs for sediment control.

Post-Construction Stormwater Guidance, United States

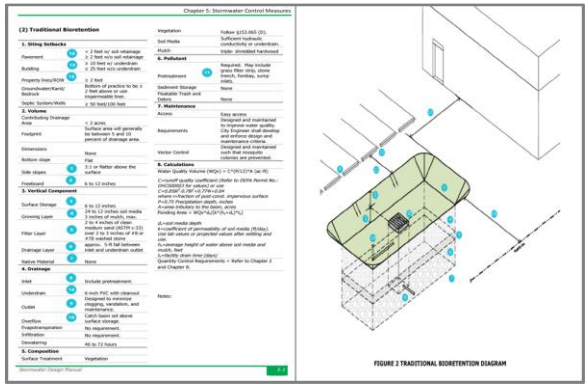


Under contract to EPA, Tetra Tech teamed with the Center for Watershed Protection to develop "Managing Stormwater in Your Community: A Guide for Building an Effective Post-Construction Program." Tetra Tech managed the development of this guidance and was the lead author on several chapters. Tetra Tech also provided editing and graphics support to produce the final document. This post-construction guide provides stormwater Phase II MS4s with practical guidance, insights, and tools to build effective post-construction programs. The guide walks a Phase II stormwater program manager through a "post-construction program life cycle" from program development, an ordinance, plan review, inspections, maintenance and other key components of a post-construction program. The guide, available at www.cwp.org/postconstruction, also includes eight electronic tools that are downloaded separately and help municipalities with program implementation.



Stormwater Design Manual, Dublin, OH

CLIENT: City of Dublin, OH
COMPLETION DATE: August 2012
REFERENCE: Barbara Cox, City of Dublin, 5800 Shier Rings Rd., Dublin, OH 43016, 614.410.4641



The City of Dublin hired Tetra Tech to revise its Stormwater Design Manual to address the new Bridge Street Corridor, form-based development code. The manual was created to provide guidance and policies on effective and preferred stormwater management approaches within the

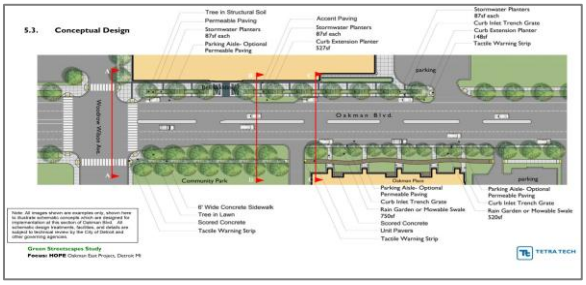
Bridge Street Corridor. This includes managing stormwater runoff from site development, streets and streetscapes (including planned new streets), and open spaces.

The following highlights exemplify this project:

- The new Bridge Street Corridor form-based code was reviewed for its freedom in facilitating stormwater BMPs.
- Stormwater BMP guidance summaries were developed consisting of a concise table of design requirements and calculations for each stormwater BMP.
- Accompanying each stormwater BMP guidance table is an isometric diagram of the BMP. Please refer to the image above. The diagram correlates major design elements with the elements from the guidance table. The primary advantage of using an isometric rather than a two-dimensional drawing is that it can show BMP setback distances from buildings, pavement, and property lines.
- A chapter of the manual is dedicated to correlating the form-based code with applicable stormwater BMPs. For example, the form-based code dictates specific requirements for a building type, such as an apartment building, including setbacks, required building zones, roof pitch, and location of parking. The manual interprets this code and indicates which BMPs are appropriate for an apartment building and also the suitable BMP placement. In addition to building type, stormwater BMPs are correlated with street types, neighborhood standards, open space types, and site development standards.
- A section of the manual addresses managing stormwater cooperatively with other site developments. This section covers cooperative design criteria, shared stormwater system agreements, and long-term operation and maintenance considerations.

CSO Green Infrastructure Program (CS-1522), Detroit, MI

CLIENT: Detroit Water and Sewerage Department (DWSD)
COMPLETION DATE: Ongoing through 2018
REFERENCE: Wendy Barrott, DWSD, 9300 W. Jefferson Ave., Detroit, MI 48209, 313.297.0300



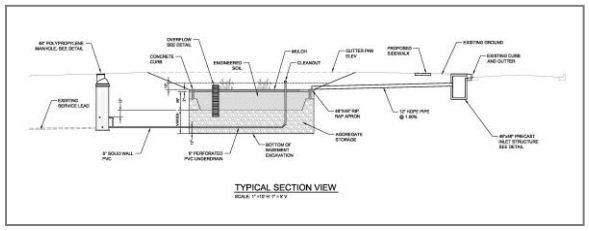
In 2010, DWSD and the Michigan Department of Environmental Quality (MDEQ) negotiated a green infrastructure program to assist in reducing CSOs to the Rouge River. This program would replace the then proposed Upper Rouge Tunnel (URT) The green infrastructure program is part of DWSD's National Pollutant Discharge Elimination System (NPDES) permit and includes a requirement to invest $15 million in green infrastructure over the period of 2013–2017 and a performance expectation of 2.8 million gallons of stormwater removed from the combined sewer system during a 2-year, 24-hour storm event.

Tetra Tech has been working with DWSD since February 2014 to implement their green infrastructure program and its NPDES permit requirements. The primary purpose of the program is the reduction of combined sewage flows through stormwater management. The project is being coordinated with DWSD, the City of Detroit, the Southeastern Municipal Council of Governments (SEMCOG) and a wide variety of other institutional partners.

Activities that are being performed by Tetra Tech and our subconsultants under this contract include:

- **Program Management** – Tetra Tech provides program management for DWSD's green infrastructure program including project planning, coordination with agencies and entities, code and ordinance review, and drainage charge credit system.
- **Green Infrastructure Plan** – Tetra Tech completed the DWSD Green Infrastructure Plan (update) in August 2014. The Plan considers requirements of the NPDES Permit and will lead to the reduction of storm water inputs into the DWSD combined sewer system, aiding in the reduction of CSO discharges. The plan establishes a balanced suite of activities which consider long-term and short-term objectives, and balance institutional structures with project implementation. Green infrastructure project types identified in the plan include green infrastructure on public properties of various types, land assembly and large-scale greening, ROW bioretention and curb extensions, street runoff diversion onto parcels and community enhancement projects with parcel and roadway bioretention and impervious area removal.
- **Opportunity Assessment** – This effort involves identifying locations where innovative green infrastructure practices could be implemented to reduce CSO discharges, evaluating the locations relative to the projects' ability to impact the combined sewer system, be cost-effective, and provide additional community benefits among other metrics.
- **Project Implementation** – Specific project types presented in the Green Infrastructure Plan include downspout disconnections (residential and non-residential buildings), public facilities flow management, park flow management, demolitions and removal of structures on vacant properties, tree planting, and transportation corridor flow management. Design of these projects requires coordination with multiple agencies, departments and stakeholders throughout the City. Tetra Tech provides design services and assistance in coordinating cross-department goals.
- **Communication and Outreach** – Successful implementation and effective maintenance of green infrastructure requires sustained communication. Tetra Tech is leading the efforts on behalf of DWSD to communicate, coordinate and collaborate with key partners on both public and private property.
- **Project implementation** – Dependent on project type and lead agency, some components of the green infrastructure program will be implemented as a design-build effort. Tetra Tech is supporting coordination with institutional partners and agencies for implementation of those projects. In addition, a number of foundations and other entities are investing in such efforts as urban agriculture. Facilitating strategic investments will be part of this effort.
- **Performance Assessment** – Performance assessments include a broad array of issues such as green infrastructure practice sustainability, community acceptance, comprehensive flow monitoring to determine the change in hydrologic characteristics and plant and vegetation health and growth (for practices with vegetation), accumulation of sediment, accumulation of trash and debris, and soil characteristics. Lessons learned through the assessment process will lead to revisions to the program as part of an adaptive management approach to the green infrastructure program.
- **Vacant Lot Greening Ecological Design Project** – Tetra Tech is acting on behalf of DWSD in a collaborative project with the University of

Michigan, Wayne State University, and the Detroit Land Bank Authority to evaluate and compare green infrastructure strategies as they relate to water quantity, water quality and aquatic toxicity. Design includes bioretention gardens in four areas once containing residential houses. Once the houses are demolished, the excavated area is backfilled with a cross-section of aggregate storage, engineered soil and planted with native plants. Runoff is conveyed along the gutter pan and diverted into the bioretention area before entering the existing catch basin in the street. Infiltration is promoted by providing an upturned elbow on the underdrain. The storage volume within the bioretention gardens allows for storage of at least the 90% non-exceedance event.



Hinkston Creek Watershed Plan and BMP Cost-Share, East-Central, KY

CLIENT: Kentucky Division of Conservation
PERIOD OF PERFORMANCE: November 2008 – September 2011

Tetra Tech developed a Quality Assurance Project Plan, collected existing and new water quality data, implemented an outreach/education program, and worked with a stakeholder group to develop a watershed-based plan addressing EPA's nine key elements for Hinkston Creek in east-central Kentucky. Hinkston Creek has been listed as impaired for many years due to poor biological conditions and elevated levels of fecal coliform bacteria, sedimentation, and nutrients linked to low dissolved oxygen and organic enrichment. The plan, which was approved by the Kentucky Division of Water in June 2011, included detailed cost and load reduction information for a suite of mostly agricultural best management practices, was based on conventional modeling approaches and innovative analytical tools.

For example, onsite wastewater treatment system potential risk to water quality was assessed via mapping analyses that considered system densities (i.e., number per square mile), system age, and proximity to surface waters. Prioritization was based on level of household density, closeness to streams, and closeness to karst topography (to account for impacts to groundwater). A riparian buffer assessment and deficiency analysis used aerial photography to determine canopy cover presence/absence and buffer zone widths. Finally, a desktop profile of high-risk stream channel reaches was conducted via mapping work that analyzed riparian vegetation (i.e., canopy cover), cattle access points, and property ownership records. The riparian deficiency data was overlaid with imagery from USDA's National Agriculture Imagery Program and was used to assess the intensity of impact on riparian areas within the Blacks and Boone Creek subwatersheds. Reaches within each subwatershed were visually scanned against the NAIP imagery to assess the land cover context for riparian buffers. Impacted riparian areas were divided into four levels of impact based on stress conditions observable from the aerial imagery, such as proximity of intense tilling and/or grazing to the stream edge, cattle access points, and lack of tree or shrub cover in the riparian buffer. Parcel boundaries were obtained from the county property valuation office to identify landowners who might be interested in stream protection BMPs.

For the outreach/education program, Tetra Tech used a multi-pronged approach, including weekly newspaper columns that mixed water quality issues

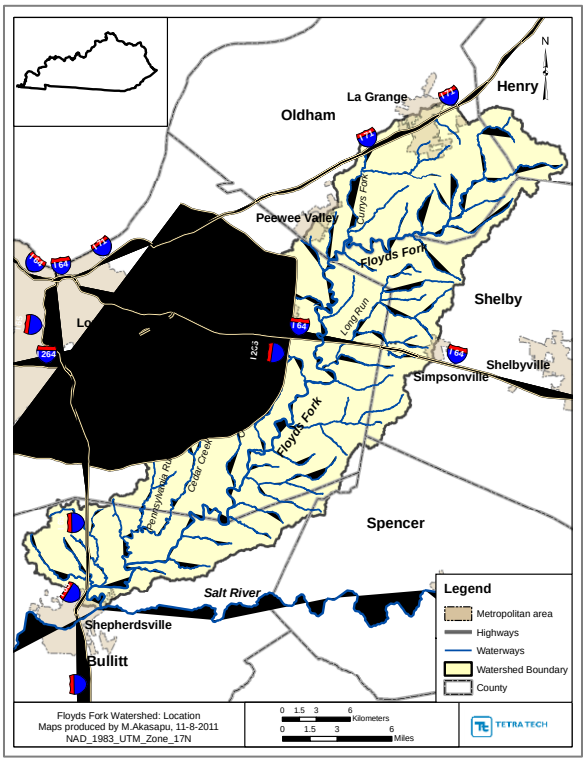
with area historical events, a series of billboards featuring positive "thank a farmer" for adopting BMP messages, an informational web site with water quality monitoring and other information, signage installed at watershed boundaries and creek crossings, and presentations to area groups on the watershed and the project. The project also sponsored a cost share program for agricultural producers interested in implementing plan-based BMPs on land in the upper portion of the watershed.

Floyds Fork Watershed Water Quality Model Development, KY

CLIENT: United States Environmental Protection Agency, Region IV
CONTACT: Tim Wool; (404) 562-9260
DURATION: June 2011 – May 2013
RELEVANT SKILL AREAS: Watershed Modeling; Water Quality Modeling; Linked Models; Model Scenarios; Nutrient Criteria Evaluation; Stakeholder Involvement; Public Meetings; Technical Advisory Meetings; Training the Staff in using the models for future needs

Floyds Fork is a major tributary of the Salt River. Its drainage area is 285 square miles and is within the Salt River basin which represents a significant part of central Kentucky. A total of six counties (Bullitt, Henry, Jefferson, Oldham, Shelby and Spencer) are partially located in the Floyds Fork watershed, making the watershed very important to a wide-range of communities. The watershed is located in northwestern Kentucky, approximately 10 miles NE of Louisville. The east side of the watershed is dominated by agricultural land use while the west side by urban land use.

The Loading Simulation Program C++ (LSPC) was used to develop a watershed model to represent the hydrological and water quality conditions in the Floyds Fork watershed. The watershed model was calibrated to daily flows and discrete water quality data measured by KDOW, USGS, local municipalities, counties and other data sources. Once calibrated, LSPC was linked to the in-stream water quality model, the Water Quality Analysis Simulation Program (WASP) by providing flows and concentrations at tributaries and local drainage areas to simulate inflow to Floyds Fork.



The WASP model was used to address the nutrient loadings and the water quality standards for chlorophyll-a and dissolved oxygen in the main stem and tributaries of Floyds Fork. Results from the WASP model were then evaluated against the water quality targets (total nitrogen and total phosphorus) developed by KDOW. Once the system of models was calibrated, they were then used to run a variety of scenarios to aid in the development of the TMDL. The scenarios included but not limited to: natural conditions, removing point source discharges, land use changes, as well as a variety of point source management strategies suggested by the Stakeholders and KDOW.

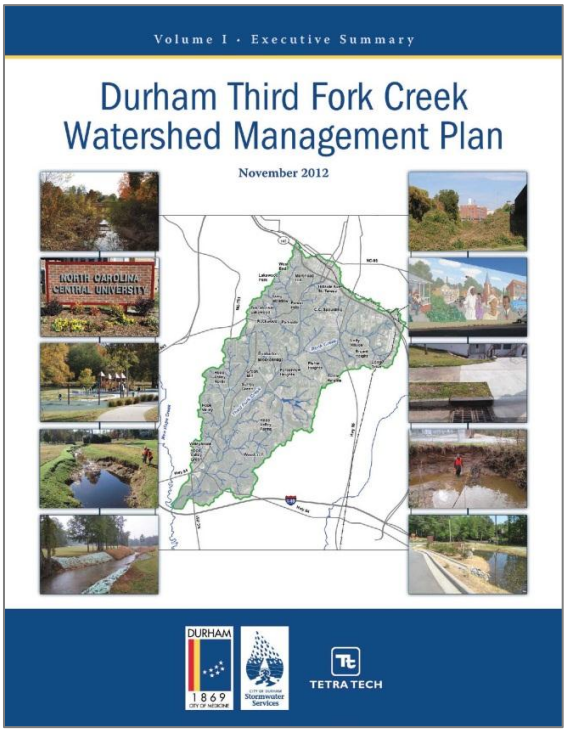
For the model development, inputs included 73 point source discharges, nearly 1,000 sink holes, over 20 springs and over 200 SSO events, making Floyds Fork watershed model quite complex. Tetra Tech applied site specific data to evaluate the contribution from various land uses such as cropland, pastureland, golf courses (part of grassland), and urban areas. Data on fertilizer and manure were collected by working closely with different stakeholder groups. Tetra Tech then developed tools to use the data to compute loading

rates to be applied to the Watershed model. Part of the success of this project was working closely with the various stakeholder groups.

Tetra Tech also participated in Technical Advisory Committee (TAC) and Stakeholder meetings, and provided technical training to the KDOW personnel. Tetra Tech developed manuals on models and model linkage to support the KDOW staff in using the models for future needs.

Third Fork Creek Watershed Plan and General Program Support, City of Durham, NC

CLIENT: Sujit Ekka, P.E., City of Durham, Department of Public Works, Stormwater Services Division, (919) 560-4326
PROJECT DATES: August 2009 – December 2012
KEY SERVICES: Stream and Upland Assessment; Watershed and BMP Modeling; Identification of Stormwater Retrofit and Stream Restoration Opportunities; Best Management Practice Selection and Prioritization; Pilot Project Preliminary Engineering Designs; Codes and Ordinance Review; Maintenance Program Review; Technical Stakeholder Facilitation; Management Strategy Development & Evaluation; Program Implementation Guidance



Tetra Tech prepared a Watershed Management Plan for Third Fork Creek for the City of Durham's Stormwater Services Division and developed a comprehensive implementation strategy for restoring watershed function and protecting the downstream public water supply in Jordan Reservoir. Tetra Tech also provided support for Stormwater Program enhancement.

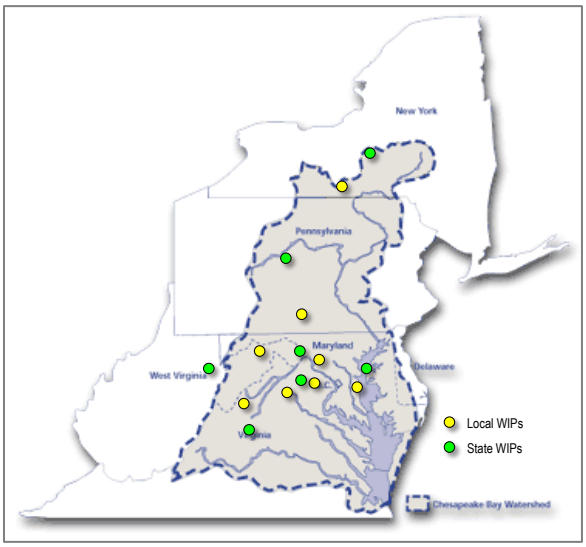
Tasks involved data compilation and analysis, stakeholder interviews, field surveys to assess condition and identify management opportunities, and setting of goals and objectives for the City's broader watershed approach and specific to the Third Fork Creek watershed.

Tetra Tech developed a continuous hydrodynamic watershed model (SWMM) to help assess water quantity and quality management needs, predict future conditions, and evaluate the effectiveness of alternative management options. Model development included working with the City to refine existing GIS-based land use and land cover (LULC) data and to generate future LULC for model application. Existing stormwater BMPs were identified and incorporated with the SWMM model. Tetra Tech helped the City prioritize stormwater retrofits and stream restoration opportunities using a variety of criteria including cost-effectiveness. Conceptual engineering designs were developed for several selected upland stormwater BMP and instream restoration sites. Tetra Tech also identified and prioritized critical lands for protection/preservation and helped to update the City's Riparian Management Manual, including specifics on invasive species for the Third Fork Creek watershed.

In addition to tasks specific to the Third Fork Creek Watershed, Tetra Tech provided a number of services that pertain to citywide programs: Local stormwater codes, ordinances, policies and procedures have been reviewed for refinement needs. Similarly, BMP maintenance standards, protocols and policies were reviewed for potential refinement. Throughout the project, Tetra Tech facilitated coordination with a team of City staff from programs needing to integrate efforts. Results from the watershed characterization, goals development, prioritization analyses, strategy development, pilot project preliminary designs, and implementation studies were compiled into a three-volume master watershed management plan set of documents for the City.

Support for Chesapeake Bay TMDL Watershed Implementation Plan Development

CLIENT: Ms. Jennifer Sincock, U.S. Environmental Protection Agency, Region 3, (215) 814-5766
PROJECT DATES: 2008–Present
KEY SERVICES: Watershed Implementation Planning; BMP Selection; Agency and Stakeholder Coordination; Tracking System Development; Modeling; Public Outreach; Public Comment Management; Meeting Logistics and Facilitation



Tetra Tech has provided a wide range of technical and managerial support to EPA Region 3 and the Chesapeake Bay Program Office (CBPO) related to TMDL development efforts for the Chesapeake Bay. EPA has led development of TMDLs through a collaborative effort involving all 6 bay states (Virginia, Maryland, Pennsylvania, Delaware, West Virginia, and New York) and the District of Columbia. A major portion of Tetra Tech's support has focused on development of statewide and higher resolution local Watershed Implementation Plans (WIPs), with the objective of identifying measures and milestones to comply with TMDL allocations.

Tetra Tech has provided support to each state and the District of Columbia for state-wide WIPs, including configuration of the CBPO's model for state use, development of management scenarios to evaluate using the model, confirmation of point source representation in the CBPO model, drafting

of WIP report sections, and stakeholder meeting support.

Tetra Tech has provided local WIP support to several MS4 and non-MS4 communities throughout the watershed. The primary objectives of Tetra Tech's support have been to review the communities' existing programs, identify measures and milestones to comply with TMDL allocations, prepare strategies, and develop tools to track future implementation. Tetra Tech has supported Prince William County, Virginia; Rivanna River Basin Commission, Virginia; Anne Arundel County, Maryland; Caroline County, Maryland; Conewago Creek Watershed Initiative, Pennsylvania; District of Columbia; Chemung County, New York; and Eastern Panhandle Planning and Development Council, West Virginia. (Although not funded through the same EPA contract, Tetra Tech is currently leading development of a WIP for Prince George's County, Maryland.)

Example tasks include:

- Participate in interagency meetings and educate groups on the TMDL and WIP process
- Collect data (e.g., BMPs, land use) for existing program and strategy evaluation
- Estimate jurisdictional sediment and nutrient pollutant loads using model output, land use, and municipal boundaries as well as some source-specific loads (e.g., septics)
- Compare Chesapeake Bay Watershed Model results to pollutant loads specified in existing local TMDLs
- Inventory, map and develop a database of planned and existing capital projects and BMPs
- Develop implementation recommendations, including identify and prioritize sites for urban stormwater and stream restoration BMPs
- Evaluate the possibility of a nutrient criteria trading program
- Estimate load reductions based on implementation recommendations
- Develop approach for estimating implementation costs
- Identify data gaps that need to be addressed for future WIP development and implementation efforts
- Prepare a guidance document based on lessons learned to support other counties with developing Phase II WIPs.

LID Manual for the Lower Maumee and Ottawa River Watersheds, Toledo, OH

CLIENT: American Rivers
PROJECT HIGHLIGHTS: Stakeholder workshop to gather needs and wishes for the manual; technically based LID manual for the design of structural and non-structural stormwater best management practices; contents customized to the unique characteristics of the watershed
PROJECT STAFF: Anne Thomas, P.E., Technical Lead; Dan Christian, P.E., Senior Water Resource Engineer; Andy Langenderfer, P.E., Project Manager
PROJECT DATES: September 2009 – May 2010
REFERENCE: Healthy Waters Campaign; American Rivers; 348 S. Erie St.; Toledo, OH 43604; Ms. Katie Swartz; Conservation Associate; 419.936.3759
MANUAL ACCESSIBLE AT: Americanrivers.org/library

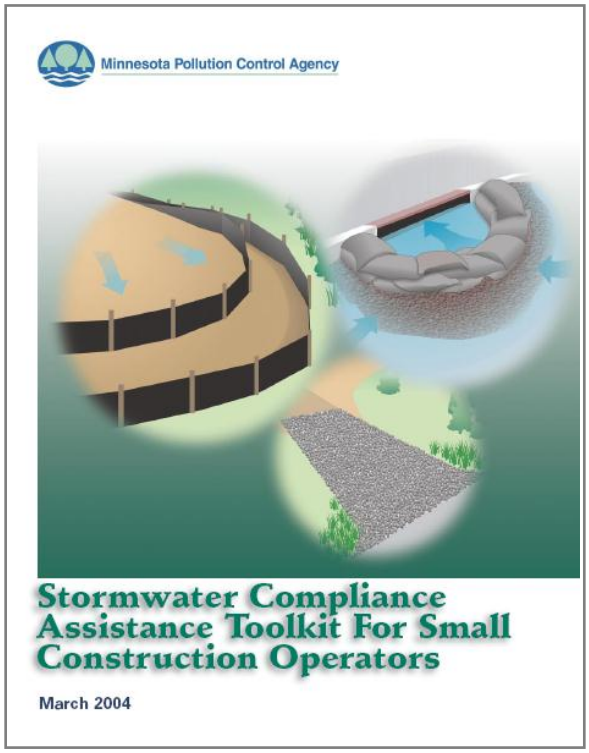
The Lower Maumee River Watershed is the most downstream subwatershed of the Maumee River Basin and thus accepts water from the entire watershed before discharging to Lake Erie. The Ottawa River Watershed is north of the Maumee River Watershed and also drains to Lake Erie. Within the two watersheds, agricultural is the predominant land use, and urban development is occurring in and around the City of Toledo and Lucas County, Ohio.

American Rivers received funding for this project from the Joyce Foundation and worked with Tetra Tech to develop the manual. The purpose of this manual is to provide stormwater managers and site designers with a common understanding of Low Impact Development (LID) goals and objectives, site assessment considerations, and a toolbox of stormwater Best Management Practices (BMP) applicable to the Lower Maumee and Ottawa River watersheds. BMP information includes design guidelines, specifications, details, and maintenance concerns as well as assistance in selecting the BMPs based on the unique characteristics of a particular site. This is a technical manual and the information provided is targeted for engineers, planners, landscape architects, technical staff to policy makers, and developers.

In addition, this manual will help to foster a watershed approach to improving water quality within the region. With this understanding, the manual focuses on stormwater BMPs that apply across the two watersheds ranging from using vegetated buffers in agricultural areas to vegetated roofs in urban areas. The aspiration is to create a user-friendly watershed-wide LID Manual to help protect the rivers and streams within the Lower Maumee and Ottawa River watersheds.

NPDES Stormwater Phase II Program Support, MN

PROJECT HIGHLIGHTS: Developed Stormwater Guidance Materials; Produced Stormwater Compliance Toolkit; Produced Stormwater Inspection Guide; Technical Support for Stormwater Program
PROJECT DURATION: October 2003 – March 2004
PROJECT STAFF: John Kosco, P.E.
REFERENCE: Minnesota Pollution Control Agency



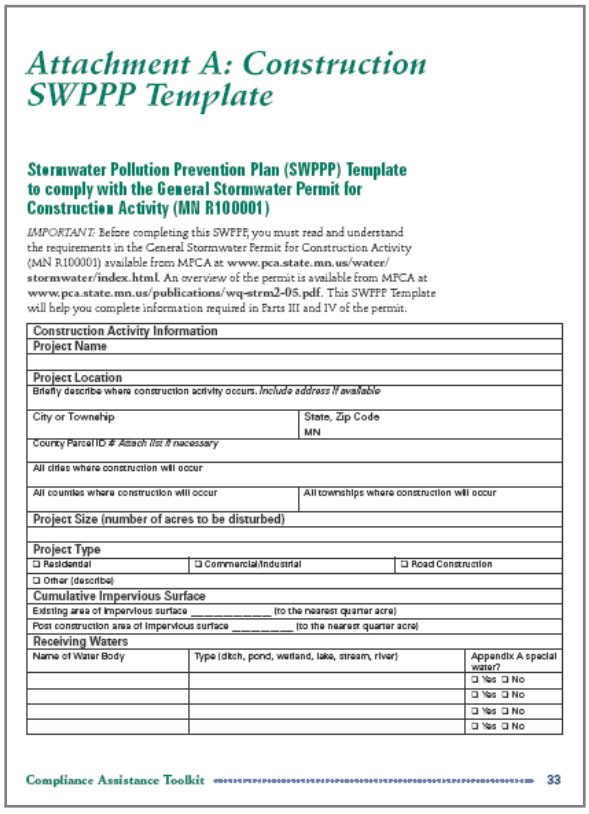
Tetra Tech developed two technical guidance manuals as part of a statewide toolkit to assist the Minnesota Pollution Control Agency in implementing stormwater requirements at small construction sites. The first guidance explained the stormwater regulatory requirements to small construction operators, while the second guidance explained the construction site inspection process to delegated state inspectors.

The *Stormwater Compliance Assistance Toolkit for Small Construction Operators* is a 44-page guide that explains the MPCA construction stormwater permit, how to develop a stormwater pollution prevention plan (SWPPP), how to select BMP, and

how to comply with the permit. In addition, Tetra Tech developed a construction SWPPP template that was included as an appendix.

The *Stormwater Construction Inspection Guide* is a 32-page document targeted to MPCA construction inspection staff and delegated inspectors. The guide explains how to conduct a construction site inspection, including required preparation before the inspection, entry procedures, records review procedures, site inspection techniques, and exit interview tips.

The guide also provides tips on what inspectors should look for when inspecting common BMPs. Finally, the guide includes information on enforcement and an example photo log page. Tetra Tech also developed a companion *Stormwater Construction Inspector's Field Guide* with the critical information needed during a field inspection formatted into a pocket guide.



Attachment A: Construction SWPPP Template

Stormwater Pollution Prevention Plan (SWPPP) Template to comply with the General Stormwater Permit for Construction Activity (MN R100001)

IMPORTANT: Before completing this SWPPP, you must read and understand the requirements in the General Stormwater Permit for Construction Activity (MN R100001) available from MPCA at **www.pca.state.mn.us/water/stormwater/index.html**. An overview of the permit is available from MPCA at **www.pca.state.mn.us/publications/wq-strm2-05.pdf**. This SWPPP Template will help you complete information required in Parts III and IV of the permit.

Construction Activity Information		
Project Name		
Project Location		
Briefly describe where construction activity occurs. *Include address if available*		
City or Township	State, Zip Code MN	
County Parcel ID # *Attach list if necessary*		
All cities where construction will occur		
All counties where construction will occur	All townships where construction will occur	
Project Size (number of acres to be disturbed)		
Project Type		
❑ Residential	❑ Commercial/Industrial	❑ Road Construction
❑ Other (describe)		
Cumulative Impervious Surface		
Existing area of impervious surface _____ (to the nearest quarter acre)		
Post construction area of impervious surface _____ (to the nearest quarter acre)		
Receiving Waters		
Name of Water Body	Type (ditch, pond, wetland, lake, stream, river)	Appendix A special water?
		❑ Yes ❑ No
		❑ Yes ❑ No
		❑ Yes ❑ No
		❑ Yes ❑ No

Compliance Assistance Toolkit 33

Watershed Plan Development and Water Quality Improvement Projects / Award and Utilization of 319(h) Grant Funding, Corbin City Reservoir / Laurel River Watershed, KY

PROJECT HIGHLIGHTS: Field water quality monitoring; watershed plan development; implementation of restoration projects; erosion potential rating
PROJECT STAFF: Steve Evans, Environmental Scientist; Jennifer Shelby, P.E., Water Resource Engineer; Bert Remley, Senior Biologist
PROJECT DATES: 2003–2006
REFERENCE: Brooke Shireman, Watershed Management; Kentucky Division of Water; 200 Fair Oaks Lane; Frankfort, KY 40601; (502) 564-7250, Ext. 553

Third Rock was retained to prepare a Watershed Plan for the Corbin City Reservoir, the drinking water supply for the City of Corbin. It is located in southeastern Kentucky with a drainage of over 200 square miles and over 450 miles of streams. The reservoir is listed as nonsupporting for drinking water and partially supporting for aquatic life due to excessive nutrients, organic enrichment/low DO, taste and odor problems, and algal growth/chlorophyll abundance. The sources of pollutants are widespread and varied with the primary sources being agricultural activities, construction/development, stormwater runoff, failing septic tanks and sanitary sewers, abandoned mine lands, streambank erosion, and the London wastewater treatment plant.

The combined impact of these pollutants has made streams, and ultimately the Corbin City Reservoir, unsafe for recreation, poor habitat for aquatic life, and problematic as a drinking water source. Third Rock biologists and engineers developed a Watershed Plan for the Corbin City Reservoir Watershed funded by a 319(h) grant from the US Environmental Protection Agency. This extensive document fully characterizes the watershed and provides solutions for the protection and remediation of these valuable water resources. The Watershed Plan has aided in the development of TMDLs for streams within the watershed and ultimately help remediate the streams and reservoir. Third Rock worked with several organizations in the process including the Kentucky Division of Water, Local and County governments, US Army Corps of Engineers, Eastern Kentucky University, and University of the Cumberlands, as well as a project team comprised of local schools, businesses, agencies, and governmental offices.

The fieldwork consisted of stream physical habitat determinations, biological surveys, and surface water quality sampling. Stream physical habitat determinations were performed to determine the sites with the poorest biological habitat due to land use practices. Information from these initial surveys was used to pick sites for biological and water quality sampling to further elucidate the level of degradation and sources of pollution. Kentucky Division of Water's aquatic assessment methodology was followed to establish the degree of impairment at the selected sites.

Physical stream degradation was consistently severe throughout the watershed. Sedimentation in streams was documented in the RBP assessments, causing frequent flooding events in the city of London. Flooding on Whitley Branch, a tributary within the London city limits, has increased significantly in recent years according to affected residents. The stream flow response to rainfall events is a high peak flow rate maintained for a short duration (flashy streams).

The watershed plan presents monitoring data, locations where pollution control will be most beneficial, and a plan for watershed-level remediation. Recommendations for nutrients and sediment control in the Corbin City Reservoir are listed and prioritized in the plan. For nutrients, recommendations concentrate on nonpoint source (NPS) pollution reduction. These include methods for reducing stormwater discharge to streams and facilitating improvements to the current SSO problem in London. For sediment issues, recommendations focus on sediment and erosion control techniques on construction sites and reducing the erosive effects of stormwater runoff. Some stream sites were identified where bank stabilization techniques could be used to reduce in-stream erosion. In addition, further study is imperative to determining the location and degree of sediment source contribution.

Following successful completion of the Corbin City Reservoir Watershed Plan, Third Rock applied for and was awarded a 319(h) grant to implement water quality improvement projects and perform additional study of the watershed. These projects include the design and construction of stormwater BMPs. Bioretention areas (rain gardens) and stormwater wetlands were designed and constructed to reduce stormwater runoff and urban nonpoint source pollutants, reduce peak runoff, and improve water quality by detaining parking lot and rooftop drainage. In a more agricultural portion of the watershed, the design and construction of a riparian wetland was used to treat storm flow and reduce sediment and nutrients transported by the Little Laurel River.

Creating or enhancing stream riparian buffers will reduce sediment, nutrients, and bacteria transported to the tributaries within the watershed. Selected locations were planted with 50-foot-wide buffers of native vegetation on both sides of a stream to improve stream water quality by trapping bacteria, sediment, and sediment-bound nutrients and infiltrating runoff. Each of these BMPs are to be monitored for success. The grant will also fund the prioritization of stream segments of Laurel and Little Laurel Rivers, Robinson Creek, and contributing tributaries for restoration or stabilization.

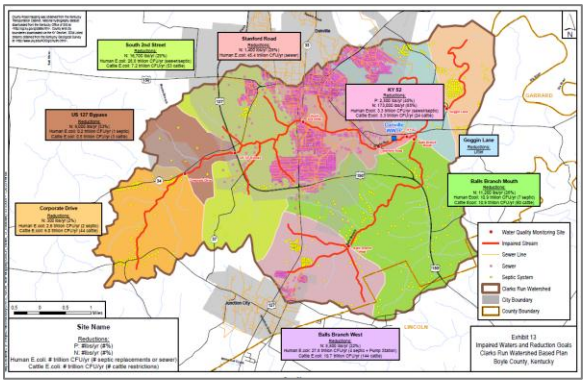
To determine areas that will be most ideal for remediation, an initial erosion inventory was completed for several miles of stream in the Little Laurel River watershed (the focus sub-watershed). The stream banks were rated for erosion potential and restoration / stabilization. Additionally, the data

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.

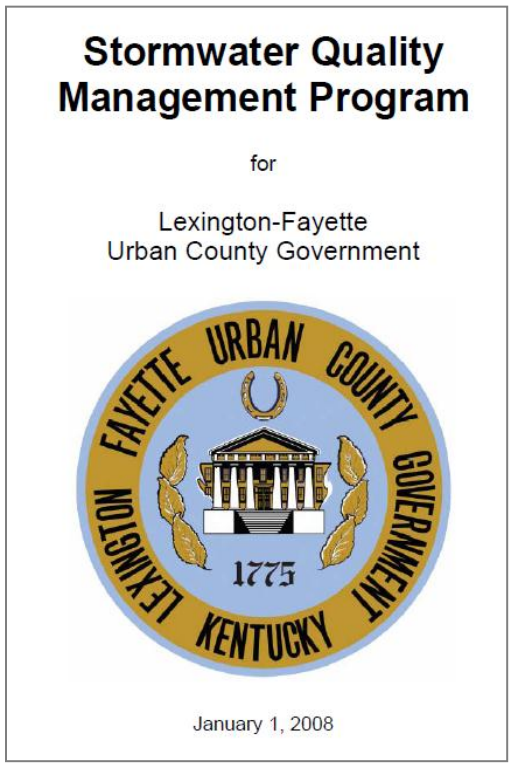
Our team and LFUCG staff have worked tirelessly for 6 years developing and implementing the many facets of Lexington's MS4 program. The pendulum has swung from non-compliance to compliance. Deadlines have been met; milestones have been reached. Measureable goals and permit requirements are continually 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 V*ision 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



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

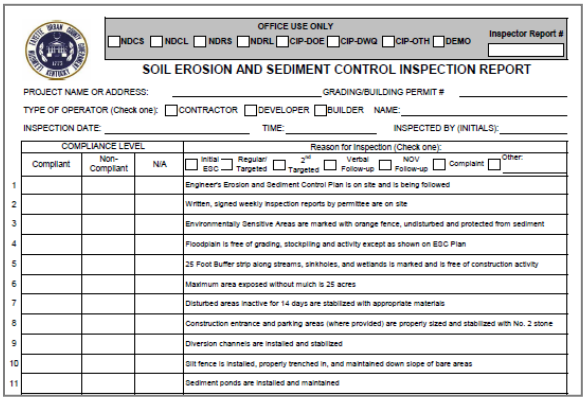
Construction Site Stormwater Program

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-DWQ ☐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 ESC ☐ 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 ESC 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	

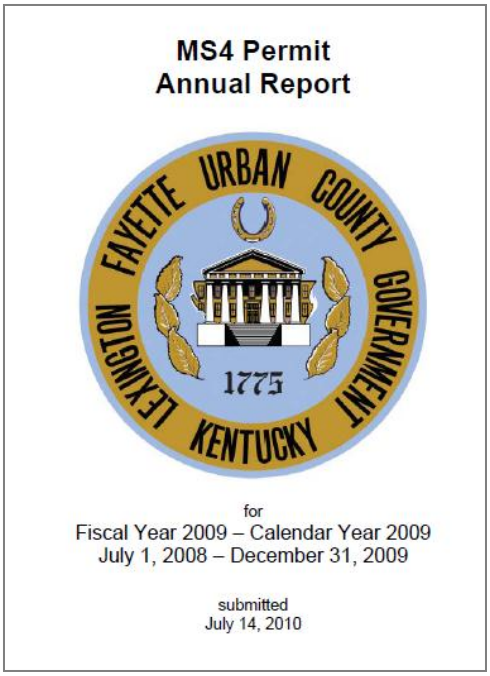
A list of the key documents follows:

- 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.



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

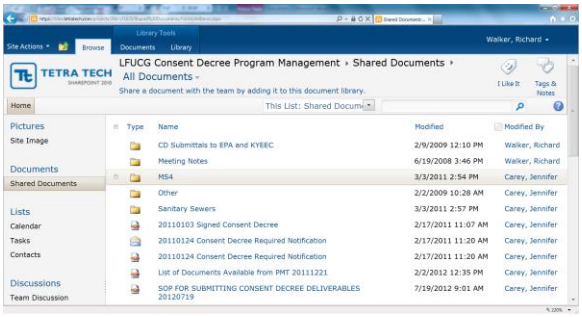
One of the goals of LFUCG is to provide the necessary training to staff so they can successfully implement the various elements of the SWQMP. Likewise, LFUCG has a goal to educate and update the public about the stormwater program and water quality.

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

reflect current and appropriate site locations and descriptions, monitoring parameters and procedures, benchmarks, and other requirements, as indicated by the QAP developed by Third Rock. Stream monitoring protocols that were revised include fish, macroinvertebrate, habitat, and water chemistry sampling.

Watershed Assessments

Third Rock has developed watershed assessments for each of the seven major watersheds. These watershed assessments provide a comprehensive characterization of each watershed including the land uses, stakeholders, drainage characteristics, and potential pollutant sources. In addition, all biological, chemical, and geomorphologic water quality data is compiled and evaluated. As part of this process, monitoring data gaps that would hinder development of effective implementation decisions were identified. These assessments capture the current state of each of the seven watersheds and provide a platform that additional monitoring, modeling and planning can develop into actionable implementation plans.

Visual Stream Assessments

Faced with the daunting task of assessing all streams within the Urban Service Area, LFUCG turned to Third Rock to provide assistance in fulfilling the permit requirement to inspect all drainage systems for illicit discharges. Third Rock visually assessed all streams in the Cane Run, Town Branch, and North and South Elkhorn watersheds for all stormwater outfalls, erosion areas, utility and stream crossings, and trash sites. For these four watersheds, Third Rock also conducted habitat assessments while in the field providing key insight on the causes of impairment in these areas. Third Rock also trained LFUCG samplers on data collection methods and provided quality control and reporting for the other watersheds in the Urban Service Area. These visual assessments detected multiple illicit discharges for elimination, improving the water quality of the MS4 area.

VISION FOR WATER QUALITY IMPROVEMENT

Where We Are

Over the past 6 years, the Tetra Tech / Third Rock team has assisted LFUCG in attaining compliance with the federal Consent Decree, KPDES Permit, and refining and implementing the SWQMP. The team has not missed a Consent Decree deliverable deadline, nor have the Kentucky Division of Water audits yielded any deficiencies. Local individuals who were once critical of the stormwater program have become participants in its improvement and are complimentary of the progress that has been made. Revisions to the Stormwater Manual are underway and a Low Impact Development Manual has been developed to guide the program toward the use of green infrastructure. All streams within the Urban Service Area have been assessed by the project team, and all watersheds have been assessed – with two comprehensive watershed plans in place. The program has maintained compliance while developing foundational ordinances, policies, and procedures. The next step is to move beyond compliance to focus on implementation plans and projects to address water quality impairments.

What's the Problem?

The protection and restoration of the physical, chemical, and biological integrity of Lexington's waters is the spirit of the law behind the Consent Decree, and the future must be focused on this goal. Monitoring has indicated that the chief water quality issues in Lexington streams are 1) human health concerns due to elevated pathogen levels and 2) impairment to aquatic life due primarily to hydrologic stress from high velocity runoff and a lack of in-stream habitat. Pollutant inputs – besides bacteria – are less of an issue locally for most stream reaches. While remediation of the sanitary sewer system should decrease the human health risk and pathogen levels in Lexington streams, current Total Maximum Daily Loads (TMDLs) indicate that plans will be needed to address stormwater contributions to pathogen impairments in the future. For the aquatic life impairments, the stormwater program will need to develop and continue to support innovative programs and policies to improve the stream habitat and promote increased rainfall infiltration and detention. Since the causes and sources of impairment are complex and multi-faceted, the solutions to these problems need to be tailored to the unique characteristics of each watershed in order to be effective. For example, stream corridor stabilization, streambank vegetation, and infiltration and detention projects implemented at varying scales can help to reduce and slow down stormwater discharges to local waterways, and lessen erosive forces and bed scouring within the channel.

Where Are We Going?

Over the next permit cycle, water quantity, water quality, and habitat impacts must be addressed through scientifically sound watershed-based planning and management. While continuing to meet the current measurable goals and performance standards, the existing program framework should be flexible enough to target resources for optimizing water quality benefits and anticipate and adapt to changes future permits may require. Projects and programs to improve water quality must be both cost-effective and prioritized to address the most significant sources of impairment and watershed degradation. In order to ensure that implementation actions address impairments, the public and key stakeholders must be able to identify areas most in need of improvement and solutions that can be implemented. The Tetra Tech / Third Rock team has the technical resources to provide LFUCG with the vision, tools, and training to address these needs and capture opportunities and increase internal capacity.

Watershed-Based Planning and Management

In order to collectively and effectively address the pollution and degradation of the health of the streams in our watersheds, all contributing sources and causes must be identified. Best Management Practices (BMPs) often fail because of improper location, design, lack of consideration of changing land use conditions, or conflicting development plans. With the publication of three pathogen total

maximum daily load (TMDL) documents for watersheds within the LFUCG MS4 area, these concerns are heightened. LFUCG is now required to evaluate BMPs and their effectiveness at reducing the load allocated to the MS4 to the maximal extent practicable. The Tetra Tech/Third Rock project team consists of local and national leaders in watershed planning, having completed projects throughout the state that are widely heralded as the industry standard. The team has already begun this process through the development of watershed assessments for each watershed and completion of a plan for Wolf Run. This Wolf Run plan includes a detailed list of BMP recommendations developed by a diverse group of stakeholders to reduce pollutants to targeted levels.

Watershed assessments have been developed for each of the seven major watersheds. If selected by LFUCG, the team would work collaboratively with LFUCG staff to develop plans with prioritized BMPs targeting the most significant impairments. These plans will also ensure that the watershed-based Stormwater Master Plans and Sanitary Sewer Remedial Measures Plans are implemented in a collaborative manner to maximize water quality benefits. The team can develop GIS-based tools to aid LFUCG and stakeholders in developing scoring criteria to prioritize projects, policies, and practices to ensure the maximum gain for available capital expenditures and/or grant funding.

Enhancement of the LFUCG Monitoring Program

Based on recommendations of Third Rock's monitoring program evaluation, the permit requirements for standardized monitoring at the mouth of the seven urbanized watersheds have been reduced in favor of a new requirement to develop a "watershed-focused monitoring expansion." These requirements are developed around the model successfully used by Third Rock in the Wolf Run Watershed Plan including water chemistry, macroinvertebrates, microbial source tracking, hydro-geomorphic characterization, and habitat assessment. This enhanced monitoring program will allow each major watershed to be evaluated in depth once per permit cycle, enabling a continuous cycle of planning, evaluation, and implementation while progressing towards water quality goals.

Interactive Public Involvement

The formation of the Stormwater Stakeholder Advisory Committee created an avenue for interested citizens to provide vital feedback on stormwater issues. Numerous public outreach events and meetings have been held, and a wide range of material has been developed to increase public knowledge of stormwater issues in each watershed. The next step in enhancing public involvement in the stormwater program could include partnering with water quality sampling volunteers on the collection of screening data, as well as interactive reporting of monitoring data and implementation projects and plans. Approaches that actively engage and involve local citizens, property owners, and businesses in monitoring water quality and promoting local streams as neighborhood amenities are often very successful in supporting the kinds of low-cost, small-scale, high-volume BMPs needed to address stormwater quality and quantity issues.

Currently, Watershed Watch and citizen groups are collecting data on streams independent of LFUCG data collection efforts. Coordinating with such volunteer groups can help focus data collection on more strategic locations, with data quality verified via quality assurance program plans and appropriate training. Such efforts could provide increased access to screening data for LFUCG and increased opportunities for education and involvement to interested volunteer groups.

Story map technology increasingly allows geographic information such as green infrastructure installations, pollutant hot spots, or riparian restorations to be displayed with easy-to-use interfaces, communicating large amounts of data in a user-friendly way. In this way, citizens can understand how their residence or business may contribute to water quality problems and what they can individually do in order to be part of the solution.

Construction and Post-Construction

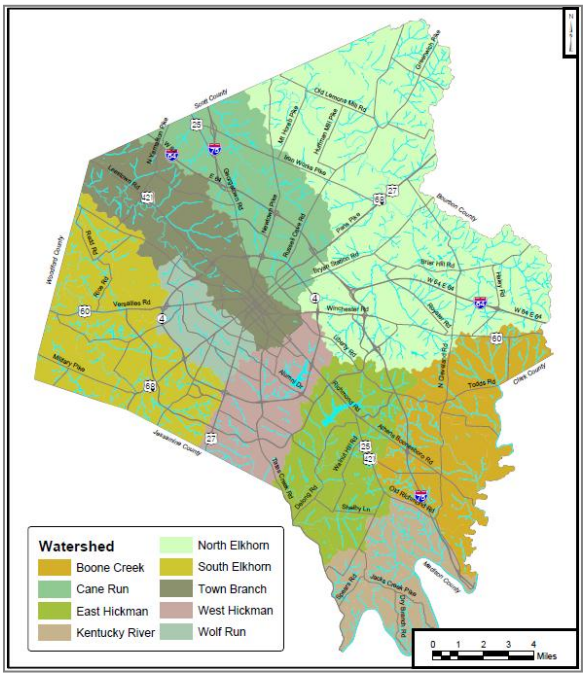
The Consent Decree, MS4 permit, and SWQMP require long-term commitments to addressing current water quality challenges and preventing the types of development, infrastructure, and activities that caused poor water quality in the past. As noted throughout this document, Lexington is making considerable progress in both areas. The construction management program is a prime example of such commitments. The industry has moved from low compliance levels a decade ago toward a culture of compliance today, with ongoing training, inspection, and – where needed – enforcement.

Post-construction requirements have also improved, through the city's adoption of new Low Impact Development Guidelines that promote the use of green infrastructure, and better oversight of stormwater conveyance and storage facilities. The Tetra Tech / Third Rock team is prepared to support Lexington further in this regard, with increased use of green infrastructure, better post-construction design guidelines, and greater integration of development with the city's growing assortment of trails, greenways, and recreational areas. Considerations for these improvements will be addressed through updates in the existing Stormwater Manual, planned for the near future.

Internal Capacity Building

Tetra Tech and Third Rock staff realize that their services will not be needed indefinitely; i.e., at some point, LFUCG staff will provide most if not all of the program management, monitoring, planning, and other services. Our team is committed to support the city as it moves toward shouldering a greater share of the workload, by training city staff and generally assisting the eventual transition of the program to staff.

In support of this overall goal, the project team will work to train LFUCG on current monitoring techniques and data analysis methods such that the overall program costs are reduced and impairments can be readily investigated. Team staff will continue to provide training, materials, and support to city construction site inspection, plan review, and other staff, to ensure that the city is both ready for a USEPA audit and prepared for operating with lesser amounts of consultant support in the future. This approach will be extended to other areas of the MS4 program now supported by Tetra Tech and Third Rock, at a level consistent with the desires and directives of LFUCG management.



SECTION 7 » DEGREE OF LOCAL EMPLOYMENT

Tetra Tech was founded in 1966 to provide engineering services related to waterways, harbors, and coastal areas. Since then, the Company has substantially increased the size and scope of its business and expanded its service offerings. **Tetra Tech's local office has approximately 30 employees and is located at 424 Lewis Hargett Circle, Suite 110**. Tetra Tech is currently registered by the Commonwealth of Kentucky in accordance with KRS 322.060 to perform the engineering services needed for this project. Our Kentucky registration number is 1555.

We understand the importance of MBE/WBE goals and are committed to providing meaningful women and minority participation at levels desired by LFUCG. Our track record on similar efforts demonstrates our commitment to, and success in, achieving or exceeding project-specific goals. **For example, on our current Program Management contract, the MBE has done approximately 35% of the work**. To achieve or exceed your 10% participation goal, we have enlisted the services of Third Rock Consultants to provide our team a highly qualified MBE. **Third Rock Consultants is located at 2526 Regency Road, Suite 180**.

Over 90% of the work on this project will be done in the Lexington offices of Tetra Tech and Third Rock Consultants.

APPENDIX A » FORMS

AFFIDAVIT

Comes the Affiant, Richard W. Walker, P.E., CFM, and after being first duly sworn, states under penalty of perjury as follows:

1. His/her name is Richard W. Walker, P.E., CFM and he/she is the individual submitting the proposal or is the authorized representative of Tetra Tech, Inc., the entity submitting the proposal (hereinafter referred to as "Proposer").

2. Proposer will pay all taxes and fees, which are owed to the Lexington-Fayette Urban County Government at the time the proposal is submitted, prior to award of the contract and will maintain a "current" status in regard to those taxes and fees during the life of the contract.

3. Proposer will obtain a Lexington-Fayette Urban County Government business license, if applicable, prior to award of the contract.

4. Proposer has authorized the Division of Central Purchasing to verify the above-mentioned information with the Division of Revenue and to disclose to the Urban County Council that taxes and/or fees are delinquent or that a business license has not been obtained.

5. Proposer has not knowingly violated any provision of the campaign finance laws of the Commonwealth of Kentucky within the past five (5) years and the award of a contract to the Proposer will not violate any provision of the campaign finance laws of the Commonwealth.

6. Proposer has not knowingly violated any provision of Chapter 25 of the Lexington-Fayette Urban County Government Code of Ordinances, known as "Ethics Act."

Continued on next page

7. Proposer acknowledges that "knowingly" for purposes of this Affidavit means, with respect to conduct or to circumstances described by a statute or ordinance defining an offense, that a person is aware or should have been aware that his conduct is of that nature or that the circumstance exists.

Further, Affiant sayeth naught.

Richard W. Walker

STATE OF Kentucky

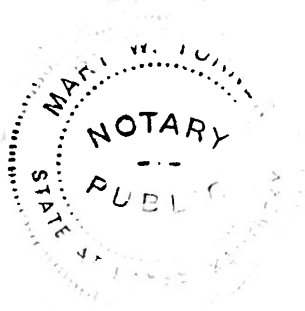
COUNTY OF Fayette

The foregoing instrument was subscribed, sworn to and acknowledged before me by RICHARD W WALKER on this the 8TH day of OCTOBER, 2014

My Commission expires: MY COMMISSION EXPIRES MAY 15, 2016

NOTARY PUBLIC, STATE AT LARGE

Notary ID# 466331



EQUAL OPPORTUNITY AGREEMENT

The Law

- Title VII of the Civil Rights Act of 1964 (amended 1972) states that it is unlawful for an employer to discriminate in employment because of race, color, religion, sex, age (40-70 years) or national origin.

- Executive Order No. 11246 on Nondiscrimination under Federal contract prohibits employment discrimination by contractor and sub-contractor doing business with the Federal Government or recipients of Federal funds. This order was later amended by Executive Order No. 11375 to prohibit discrimination on the basis of sex.

- Section 503 of the Rehabilitation Act of 1973 states:

  The Contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap.

- Section 2012 of the Vietnam Era Veterans Readjustment Act of 1973 requires Affirmative Action on behalf of disabled veterans and veterans of the Vietnam Era by contractors having Federal contracts.

- Section 206(A) of Executive Order 12086, Consolidation of Contract Compliance Functions for Equal Employment Opportunity, states:

  The Secretary of Labor may investigate the employment practices of any Government contractor or sub-contractor to determine whether or not the contractual provisions specified in Section 202 of this order have been violated.

****

The Lexington-Fayette Urban County Government practices Equal Opportunity in recruiting, hiring and promoting. It is the Government's intent to affirmatively provide employment opportunities for those individuals who have previously not been allowed to enter into the mainstream of society. Because of its importance to the local Government, this policy carries the full endorsement of the Mayor, Commissioners, Directors and all supervisory personnel. In following this commitment to Equal Employment Opportunity and because the Government is the benefactor of the Federal funds, it is both against the Urban County Government policy and illegal for the Government to let contracts to companies which knowingly or unknowingly practice discrimination in their employment practices. Violation of the above mentioned ordinances may cause a contract to be canceled and the contractors may be declared ineligible for future consideration.

Please sign this statement in the appropriate space acknowledging that you have read and understand the provisions contained herein. Return this document as part of your application packet.

Bidders

I/We agree to comply with the Civil Rights Laws listed above that govern employment rights of minorities, women, Vietnam veterans, handicapped and aged persons.

Richard W. Walk
Signature

Tetra Tech, Inc.
Name of Business

Company Totals (U.S Offices)

TETRA TECH, INC	TOTAL				M	F	MALES						FEMALES					
GRAND TOTAL	Employees	Male	Female	Minority	H	H	W	B	NHPI	A	NA	2	W	B	NHPI	A	NA	2
Exec/Sr Officials & Ma	292	260	32	29	3	0	232	4	0	18	1	2	31	1	0	0	0	0
First/Mid Officials & M	1200	902	298	167	27	10	790	27	1	48	2	7	253	9	0	20	3	3
Professionals	4206	2703	1503	836	118	95	2221	110	7	199	13	35	1149	89	3	135	6	26
Technical	943	805	138	284	110	11	562	51	0	75	7	10	107	5	0	11	0	4
Sales Workers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Office & Clerical	664	135	529	218	15	64	94	13	1	6	1	5	352	66	1	25	8	13
Craft Workers (skilled	162	158	4	53	35	0	106	3	0	9	5	0	3	1	0	0	0	0
Craft Workers (Semi-s	551	535	16	139	92	0	396	18	2	1	17	9	16	0	0	0	0	0
Laborers (unskilled)	508	489	19	243	171	9	260	19	0	24	10	6	6	1	0	4	0	0
Service Workers	14	10	4	2	0	0	9	1	0	0	0	0	3	1	0	0	0	0
GRAND TOTAL	8540	5997	2543	1961	571	189	4660	246	11	380	56	73	1919	173	4	195	17	46
PERCENTAGE	100.0%	70.2%	29.8%	23.0%	6.7%	2.2%	54.6%	2.9%	0.1%	4.4%	0.7%	0.9%	22.5%	2.0%	0.0%	2.3%	0.2%	0.5%

Prepared by: Janet Bruner | Human Resources Manager
Tetra Tech, Inc. | janet.brunner@tetratech.com

Name & Title

Firm Submitting Proposal: Tetra Tech, Inc.

Complete Address: 424 Lewis Hargett Circle, Suite 110

Street City Zip

Contact Name: Richard W. Walker, P.E. Title: Vice President

Telephone Number: (859) 223-8000 Fax Number: (859) 224-1025

Email address: richard.walker@tetratech.com

LFUCG MWDBE PARTICIPATION FORM
Bid/RFP/Quote Reference # 57-2014

The MWDBE subcontractors listed have agreed to participate on this Bid/RFP/Quote. If any substitution is made or the total value of the work is changed prior to or after the job is in progress, it is understood that those substitutions must be submitted to Central Purchasing for approval immediately.

MWDBE Company, Name, Address, Phone, Email	Work to be Performed	Total Dollar Value of the Work	% Value of Total Contract
1.			
2.			
3.			
4.			

Tetra Tech will meet or exceed LFUCG's goal of 10% MBE/WBE participation for its contracts with the City of Lexington.

The undersigned company representative submits the above list of MWDBE firms to be used in accomplishing the work contained in this Bid/RFP/Quote. Any misrepresentation may result in the termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Tetra Tech, Inc.
Company

Richard W. Walker, P.E., CFM
Company Representative

10/13/2014
Date

Vice President
Title

LFUCG MWDBE SUBSTITUTION FORM
Bid/RFP/Quote Reference # 57-2014

The substituted MWDBE subcontractors listed below have agreed to participate on this Bid/RFP/Quote. These substitutions were made prior to or after the job was in progress. These substitutions were made for reasons stated below and are now being submitted to Central Purchasing for approval. By the authorized signature of a representative of our company, we understand that this information will be entered into our file for this project.

SUBSTITUTED MWDBE Company Name, Address, Phone, Email	MWDBE Formally Contracted/ Name, Address, Phone, Email	Work to Be Performed	Reason for the Substitution	Total Dollar Value of the Work	% Value of Total Contract
1.					
2.					
3.			N/A		
4.					

The undersigned acknowledges that any misrepresentation may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Tetra Tech, Inc.
Company

Richard W. Walker, P.E., CFM
Company Representative

10/13/2014
Date

Vice President
Title

MWDBE QUOTE SUMMARY FORM

Bid/RFP/Quote Reference # 57-2014

The undersigned acknowledges that the minority subcontractors listed on this form did submit a quote to participate on this project.

Company Name	Contact Person
Address/Phone/Email	Bid Package / Bid Date

MWDBE Company Address	Contact Person	Contact Information (work phone, Email, cell)	Date Contacted	Services to be performed	Method of Communication (email, phone meeting, ad, event etc)	Total dollars $$ Do Not Leave Blank (Attach Documentation)	MBE * AA HA AS NA Female
N/A							

(MBE designation / AA=African American / HA= Hispanic American/AS = Asian American/Pacific Islander/ NA= Native American)

The undersigned acknowledges that all information is accurate. Any misrepresentation may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and claims.

Tetra Tech, Inc.
Company

Richard W. Walker, P.E., CFM
Company Representative

10/13/2014
Date

Vice President
Title

LFUCG SUBCONTRACTOR MONTHLY PAYMENT REPORT

The LFUCG has a 10% goal plan adopted by city council to increase the participation of minority and women owned businesses in the procurement process. In order to measure that goal LFUCG will track spending with MWDBE vendors on a monthly basis. By the signature below of an authorized company representative, you certify that the information is correct, and that each of the representations set forth below is true. Any misrepresentation may result in termination of the contract and/or prosecution under applicable Federal and State laws concerning false statements and false claims. Please submit this form monthly to the Division of Central Purchasing/ 200 East Main Street / Room 338 / Lexington, KY 40507.

Bid/RFP/Quote # 57-2014

Total Contract Amount Awarded to Prime Contractor for this Project_____

Project Name/ Contract #	Work Period/ From: To:
Company Name:	Address:
Federal Tax ID:	Contact Person:

Subcontractor Vendor ID (name, address, phone, email	Description of Work	Total Subcontract Amount	% of Total Contract Awarded to Prime for this Project	Total Amount Paid for this Period	Purchase Order number for subcontractor work (please attach PO)	Scheduled Project Start Date	Scheduled Project End Date
			N/A				

By the signature below of an authorized company representative, you certify that the information is correct, and that each of the representations set forth below is true. Any misrepresentations may result in the termination of the contract and/or prosecution under applicable Federal and State laws concerning false statements and false claims.

_____ _____

Company Company Representative

_____ _____

Date Title

LFUCG STATEMENT OF GOOD FAITH EFFORTS
Bid/RFP/Quote #_____57-2014_____

By the signature below of an authorized company representative, we certify that we have utilized the following Good Faith Efforts to obtain the maximum participation by MWDBE business enterprises on the project and can supply the appropriate documentation.

_____ Advertised opportunities to participate in the contract in at least two (2) publications of general circulation media; trade and professional association publications; small and minority business or trade publications; and publications or trades targeting minority, women and disadvantaged businesses not less than fifteen (15) days prior to the deadline for submission of bids to allow MWDBE firms to participate.

_____ Included documentation of advertising in the above publications with the bidders good faith efforts package

_____ Attended LFUCG Central Purchasing Economic Inclusion Outreach event

_____ Attended pre-bid meetings that were scheduled by LFUCG to inform MWDBEs of subcontracting opportunities

_____ Sponsored Economic Inclusion event to provide networking opportunities for prime contractors and MWDBE firms

_____ Requested a list of MWDBE subcontractors or suppliers from LFUCG Economic Engine and showed evidence of contacting the companies on the list(s).

_____ Contacted organizations that work with MWDBE companies for assistance in finding certified MWBDE firms to work on this project. Those contacted and their responses should be a part of the bidder's good faith efforts documentation.

_____ Sent written notices, by certified mail, email or facsimile, to qualified, certified MWDBEs soliciting their participation in the contract not less that seven (7) days prior to the deadline for submission of bids to allow them to participate effectively.

_____ Followed up initial solicitations by contacting MWDBEs to determine their level of interest.

_____ Provided the interested MWBDE firm with adequate and timely information about the plans, specifications, and requirements of the contract.

_____ Selected portions of the work to be performed by MWDBE firms in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible

units to facilitate MWDBE participation, even when the prime contractor may otherwise perform these work items with its own workforce

_____ Negotiated in good faith with interested MWDBE firms not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached.

_____ Included documentation of quotations received from interested MWDBE firms which were not used due to uncompetitive pricing or were rejected as unacceptable and/or copies of responses from firms indicating that they would not be submitting a bid.

_____ Bidder has to submit sound reasons why the quotations were considered unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a MWDBE quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy MWDBE goals.

_____ Made an effort to offer assistance to or refer interested MWDBE firms to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal

_____ Made efforts to expand the search for MWBE firms beyond the usual geographic boundaries.

X Other - any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include MWDBE participation.

Direct contact with MBE/WBE firms

Failure to submit any of the documentation requested in this section may be cause for rejection of bid. Bidders may include any other documentation deemed relevant to this requirement. Documentation of Good Faith Efforts are to be submitted with the Bid, if the participation Goal is not met.

The undersigned acknowledges that all information is accurate. Any misrepresentations may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and claims.

Tetra Tech, Inc.	Richard W. Walker, P.E., CFM
Company	**Company Representative**
10/13/2014	Vice President
Date	**Title**

GENERAL PROVISIONS

1. Each Respondent shall comply with all Federal, State & Local regulations concerning this type of service or good.

   The Respondent agrees to comply with all statutes, rules, and regulations governing safe and healthful working conditions, including the Occupational Health and Safety Act of 1970, *29 U.S.C. 650 et. seq.*, as amended, and KRS Chapter 338. The Respondent also agrees to notify the LFUCG in writing immediately upon detection of any unsafe and/or unhealthful working conditions at the job site. The Respondent agrees to indemnify, defend and hold the LFUCG harmless from all penalties, fines or other expenses arising out of the alleged violation of said laws.

2. Failure to submit ALL forms and information required in this RFP may be grounds for disqualification.

3. Addenda: All addenda, if any, shall be considered in making the proposal, and such addenda shall be made a part of this RFP. Before submitting a proposal, it is incumbent upon each proposer to be informed as to whether any addenda have been issued, and the failure to cover in the bid any such addenda may result in disqualification of that proposal.

4. Proposal Reservations: LFUCG reserves the right to reject any or all proposals, to award in whole or part, and to waive minor immaterial defects in proposals. LFUCG may consider any alternative proposal that meets its basic needs.

5. Liability: LFUCG is not responsible for any cost incurred by a Respondent in the preparation of proposals.

6. Changes/Alterations: Respondent may change or withdraw a proposal at any time prior to the opening; however, no oral modifications will be allowed. Only letters, or other formal written requests for modifications or corrections of a previously submitted proposal which is addressed in the same manner as the proposal, and received by LFUCG prior to the scheduled closing time for receipt of proposals, will be accepted. The proposal, when opened, will then be corrected in accordance with such written request(s), provided that the written request is contained in a sealed envelope which is plainly marked "modifications of proposal".

7. Clarification of Submittal: LFUCG reserves the right to obtain clarification of any point in a bid or to obtain additional information from a Respondent.

8. Bribery Clause: By his/her signature on the bid, Respondent certifies that no employee of his/hers, any affiliate or Subcontractor, has bribed or attempted to bribe an officer or employee of the LFUCG.

9. Additional Information: While not necessary, the Respondent may include any product brochures, software documentation, sample reports, or other documentation that may assist LFUCG in better understanding and evaluating the Respondent's response. Additional documentation shall not serve as a substitute for other documentation which is required by this RFP to be submitted with the proposal,

10. Ambiguity, Conflict or other Errors in RFP: If a Respondent discovers any ambiguity, conflict, discrepancy, omission or other error in the RFP, it shall immediately notify LFUCG of such error in writing and request modification or clarification of the document if allowable by the LFUCG.

11. Agreement to Bid Terms: In submitting this proposal, the Respondent agrees that it has carefully examined the specifications and all provisions relating to the work to be done attached hereto and made part of this proposal. By acceptance of a Contract under this RFP, proposer states that it understands the meaning, intent and requirements of the RFP and agrees to the same. The successful Respondent shall warrant that it is familiar with and understands all provisions herein and shall warrant that it can comply with them. No additional compensation to Respondent shall be authorized for services or expenses reasonably covered under these provisions that the proposer omits from its Proposal.

12. Cancellation: If the services to be performed hereunder by the Respondent are not performed in an acceptable manner to the LFUCG, the LFUCG may cancel this contract for cause by providing written notice to the proposer, giving at least thirty (30) days notice of the proposed cancellation and the reasons for same. During that time period, the proposer may seek to bring the performance of services hereunder to a level that is acceptable to the LFUCG, and the LFUCG may rescind the cancellation if such action is in its best interest.

A. Termination for Cause

(1) LFUCG may terminate a contract because of the contractor's failure to perform its contractual duties

(2) If a contractor is determined to be in default, LFUCG shall notify the contractor of the determination in writing, and may include a specified date by which the contractor shall cure the identified deficiencies. LFUCG may proceed with termination if the contractor fails to cure the deficiencies within the specified time.

(3) A default in performance by a contractor for which a contract may be terminated shall include, but shall not necessarily be limited to:
(a) Failure to perform the contract according to its terms,

conditions and specifications;

(b) Failure to make delivery within the time specified or according to a delivery schedule fixed by the contract;

(c) Late payment or nonpayment of bills for labor, materials, supplies, or equipment furnished in connection with a contract for construction services as evidenced by mechanics' liens filed pursuant to the provisions of KRS Chapter 376, or letters of indebtedness received from creditors by the purchasing agency;

(d) Failure to diligently advance the work under a contract for construction services;

(e) The filing of a bankruptcy petition by or against the contractor; or

(f) Actions that endanger the health, safely or welfare of the LFUCG or its citizens.

B. At Will Termination

Notwithstanding the above provisions, the LFUCG may terminate this contract at will in accordance with the law upon providing thirty (30) days written notice of that intent, Payment for services or goods received prior to termination shall be made by the LFUCG provided these goods or services were provided in a manner acceptable to the LFUCG. Payment for those goods and services shall not be unreasonably withheld.

13. Assignment of Contract: The contractor shall not assign or subcontract any portion of the Contract without the express written consent of LFUCG. Any purported assignment or subcontract in violation hereof shall be void. It is expressly acknowledged that LFUCG shall never be required or obligated to consent to any request for assignment or subcontract; and further that such refusal to consent can be for any or no reason, fully within the sole discretion of LFUCG.

14. No Waiver: No failure or delay by LFUCG in exercising any right, remedy, power or privilege hereunder, nor any single or partial exercise thereof, nor the exercise of any other right, remedy, power or privilege shall operate as a waiver hereof or thereof. No failure or delay by LFUCG in exercising any right, remedy, power or privilege under or in respect of this Contract shall affect the rights, remedies, powers or privileges of LFUCG hereunder or shall operate as a waiver thereof.

15. Authority to do Business: The Respondent must be a duly organized and authorized to do business under the laws of Kentucky. Respondent must be in good standing and have full legal capacity to provide the services specified under this Contract. The Respondent must have all necessary right and lawful authority to enter into this Contract for the full term hereof and that proper corporate or other action has been duly taken authorizing the Respondent to enter into this

Contract. The Respondent will provide LFUCG with a copy of a corporate resolution authorizing this action and a letter from an attorney confirming that the proposer is authorized to do business in the State of Kentucky if requested. All proposals must be signed by a duly authorized officer, agent or employee of the Respondent.

16. Governing Law: This Contract shall be governed by and construed in accordance with the laws of the Commonwealth of Kentucky. In the event of any proceedings regarding this Contract, the Parties agree that the venue shall be the Fayette County Circuit Court or the U.S. District Court for the Eastern District of Kentucky, Lexington Division. All parties expressly consent to personal jurisdiction and venue in such Court for the limited and sole purpose of proceedings relating to this Contract or any rights or obligations arising thereunder. Service of process may be accomplished by following the procedures prescribed by law.

17. Ability to Meet Obligations: Respondent affirmatively states that there are no actions, suits or proceedings of any kind pending against Respondent or, to the knowledge of the Respondent, threatened against the Respondent before or by any court, governmental body or agency or other tribunal or authority which would, if adversely determined, have a materially adverse effect on the authority or ability of Respondent to perform its obligations under this Contract, or which question the legality, validity or enforceability hereof or thereof.

18. Contractor understands and agrees that its employees, agents, or subcontractors are not employees of LFUCG for any purpose whatsoever. Contractor is an independent contractor at all times during the performance of the services specified.

19. If any term or provision of this Contract shall be found to be illegal or unenforceable, the remainder of the contract shall remain in full force and such term or provision shall be deemed stricken.

Richard W. Walker _____ 10/13/2014

Signature Date

CONFIDENTIAL

AFFIRMATIVE ACTION PROGRAM OF

TETRA TECH, INC.

EFFECTIVE DATE OF THIS AAP: 01/01/14 through 12/31/14

TABLE OF CONTENTS

I. INTRODUCTION

EQUAL EMPLOYMENT OPPORTUNITY AFFIRMATIVE ACTION PROGRAM

The following pages represent the Affirmative Action Program of Tetra Tech, Inc., (3475 E Foothill Blvd, Pasadena, CA 91107), herein after referred to as Tetra Tech.

This Affirmative Action Program (AAP) is the property of Tetra Tech. The detailed information contained in this Affirmative Action Program is provided in good faith, and in compliance with Executive Order 11246 and other applicable federal and state laws, and regulations developed by the office of Federal Contract Compliance Programs (OFCCP) pertaining to the development of AAP's by federal contractors and subcontractors. Statements and data in this Affirmative Action Program are subject to a misinterpretation and a misuse which could be damaging to the business goals and interests of Tetra Tech in ways which may be independent of and adverse to Tetra Tech's affirmative action and equal employment opportunity obligations and objectives.

Therefore, this AAP is developed with the specific intent and requirement that:

1. This AAP and the information herein will be made available or submitted to the OFCCP upon demand, pursuant to the relevant provisions of Executive Order 11246 and applicable regulations developed by the OFCCP. The information and data contained in this AAP is to be kept strictly confidential and shall not be disclosed to anyone not employed by the OFCCP without prior written notice to and the written consent of Tetra Tech to disclose the relevant information contained herein. If consent is not given and the OFCCP still intends to disclose all or any part of this AAP, Tetra Tech shall have the right to appeal the decision of the OFCCP through any agency appeal procedure that may exist prior to any disclosure.

2. No information contained in this AAP is to be disclosed, copied, reproduced, or removed from the premises of the OFCCP, except in the normal course of business by an employee of the OFCCP, nor is any unauthorized person to be given access to its contents in any manner whatsoever without the prior written consent of an authorized representative of Tetra Tech.

3. Any employee, applicant, government office or any other entity or other person(s) who are allowed by Tetra Tech to review any or all of this AAP, for whatever reason or purpose, shall keep such information strictly confidential and shall not remove, copy, or in any manner whatsoever disclose, make available, discuss or disseminate the information contained in this AAP.

II. COMPANY PROFILE

Tetra Tech, Inc. (NASDAQ: TTEK) is a leading provider of specialized management consulting and technical services in three principal business areas: resource management, infrastructure and communications. Our management consulting services are complemented by our technical services, including research and development, applied science, engineering and architectural design, construction management, and operations and maintenance. We provide these services to a diverse base of public and private sector clients. Founded in 1966, we have over 14,000 employees located in more than 330 offices worldwide.

III. EEO RESPONSIBILITIES
[41 CFR 60-2.17 (a)]

In most instances, department managers and supervisors will be responsible for the selection of individuals to fill approved vacancies. However, the selection process requires that managers and supervisors be aware of and take into consideration the EEO Policy and AAP goals. Tetra Tech's EEO Policy and AAP will be implemented and administered as outlined below.

A. EEO Officer

Dan Batrack, CEO and COO, has assigned the overall responsibility for Equal Employment Opportunity and Affirmative Action Program compliance to Richard Lemmon, Vice President, who is the Equal Employment Opportunity Officer for Tetra Tech. As EEO Officer, Richard Lemmon is specifically responsible for the implementation and monitoring of the EEO Policy and the Affirmative Action Program. Richard Lemmon's duties and responsibilities include as a minimum, but are not limited to the following:

1. Ensuring that an Affirmative Action Program is adopted and effectively implemented each year, developing policy statements, internal and external communication techniques.
2. Designating or assisting in the selection of a facility EEO Coordinator.
3. Assisting in the identification of focus areas, suggesting corrective action, and the establishment of goals and objectives.
4. Designing and implementing audit and reporting systems that will measure progress to goals and objectives.
5. Conducting meetings with managers, supervisors, and employees to ensure that Tetra Tech's EEO Policy and AAP objectives are understood and good-faith efforts are being made to achieve results.
6. Reviewing Tetra Tech's AAP progress toward goals and objectives with senior management.
7. Ensuring that the work performance of management employees is evaluated, in part, on the basis of their affirmative action efforts and results.
8. Providing guidance to managers and supervisors to prevent racial, ethnic, religious and sexual harassment of employees.
9. Serving as a liaison between Tetra Tech and minority/female organizations.
10. Keep management informed of developments in EEO/AA laws and requirements.

B. EEO Coordinator

Janet Brunner, Sr. Human Resources Manager, is the Equal Employment Opportunity Coordinator for the AAP year. Janet Brunner, will be responsible for assisting the EEO Officer, as requested, in the performance of any of the duties stated above, developing or obtaining assistance in developing, implementing, and monitoring of the AAP. The EEO Coordinator has been given the full support of senior management and is assured the necessary support to execute all AAP responsibilities.

The EEO Coordinator's responsibilities include, but are not limited to the following:

1. Having an updated AAP in place at the beginning of each plan year.
2. Assisting management in the identification of focus areas and the development of corrective action steps.
3. Submitting an AAP Progress Report to Human Resources and to appropriate facility management which details progress towards AAP goals and includes the applicant flow, new hire, transfer, promotion and termination logs.
4. Serving as liaison between employees and management at this facility.
5. Serving as liaison between this facility and organizations concerned with employment opportunities for minorities and females.

6. Ensuring that minority and female employees are encouraged and afforded a meaningful opportunity to participate in all present and future educational, training, recreational and social activities sponsored by Tetra Tech, and that all facilities, such as lockers and restrooms, are comparable for both sexes.
7. Reviewing all technical forms (i.e., application forms and posters) for compliance with federal regulations.
8. Monitoring the effectiveness of the EEO Policy, the AAP, training programs, and hiring and promotional patterns to determine if minorities and females are given a full opportunity for employment and advancement.

C. Human Resources Department

As the Equal Employment Opportunity Coordinator for this facility, Janet Brunner has been given the authority and responsibility for implementing and monitoring the EEO and AAP programs for this facility. Janet Brunner Sr. Human Resources Manager will be assisted by and receive primary staff support from individuals assigned to the Human Resources Department. The Human Resources Department, will assume the day-to-day responsibility for the EEO and AAP programs. The responsibilities of the Human Resources Department include, but are not limited to the following:

1. Developing policy statements, Affirmative Action Programs, and internal and external communication techniques.
2. Assisting management in the identification of focus areas and arriving at appropriate solutions.
3. Designing and implementing audit and reporting systems that will:
    a. Measure the effectiveness of Tetra Tech's EEO and affirmative action programs.
    b. Indicate the need for remedial action.
    c. Determine the degree to which Tetra Tech's goals and objectives have been attained.
4. Serving as liaison or assisting facility management in meetings between Tetra Tech and enforcement agencies.
5. Serving as liaison or assisting local and facility management in meetings between Tetra Tech and organizations concerned with employment opportunities for minorities and females.
6. Keeping management informed of the latest developments and requirements pertaining to EEO and affirmative action.
7. Assisting in the development of reports to management on the status of Tetra Tech's EEO Policy and Affirmative Action Program.
8. Assisting any present or future field facilities in preparing and implementing effective Affirmative Action Plans through the issuance of guidelines and appropriate training.
9. Coordinating and participating in compliance reviews by the Office of Federal Contract Compliance Programs, as appropriate.
10. Investigating all formal charges of discrimination at Tetra Tech's facilities, in addition to participating with this facility's senior management representative in conciliation negotiations with government agencies, as necessary.

IV. IDENTIFICATION OF POTENTIAL FOCUS AREAS
[41 CFR 60-2.17 (b)]

A. WORKFORCE

The workforce is evaluated by department and job group to determine if minorities and women are fully utilized. An analysis is performed by department to ensure that minority and female representation is at an acceptable range as compared to the workforce.

B. PERSONNEL ACTIVITY

Personnel activity including applicant flow, hires, terminations, and promotions are analyzed to determine if there are any problem areas. All employees are treated equally and have an opportunity to advance. Efforts are made to identify qualified minority, females, disabled and veteran employees for promotion. The criteria for both transfers and promotions are based objectively on skills, qualifications, experience, education and the employee's work record, as appropriate. Transfer and promotion practices currently in effect do not hamper the upward mobility of qualified female and minority employees.

C. COMPENSATION

Compensation analyses are performed to ensure that there are no gender or ethnic pay disparities. An analysis is performed on each job title comparing minorities to non-minorities and women to men. If any inequalities exist, a thorough analysis is conducted to correct or explain the difference. This analysis may include a review or the employees' length of service, years of experience, performance evaluations, prior related experience, education, special expertise, or the department or unit where the employees work.

D. SELECTION

The following selection procedures are followed:

1. Job descriptions list the minimum requirements for a particular job and are accurate in relating to actual job functions.
2. No written employment tests are currently being used.
3. The application and interview process has been reviewed and found to be free of bias and does not work to the disadvantage of minority or female applicants.
4. All job applications are retained in the active file for a minimum of at least two years.
5. A detailed record of all data relevant to recruitment and other personnel decisions which involved Affirmative Action candidates or employees is kept by the EEO Coordinator.
6. When an accommodation is made to hire an individual with a disability, a description of the accommodation is recorded in the personnel file.
7. All recruitment sources are notified annually of the EEO policy and Tetra Tech's desire to hire women and members of minority groups.

E. OTHER AREAS OF FOCUS

Facility & Company Sponsored Activities

Facility and Company sponsored activities are all administered on a non-discriminatory basis.

Public Transportation

Public transportation is available to this facility from surrounding metropolitan areas. Schedules are such that employees can use such transportation both before and after working hours.

Housing

Integrated housing is available to all employees in the area surrounding this facility. Both privately owned homes and commercial rental units are within the immediate area and within commuting distance.

Physical Facilities

This location does not maintain, provide or permit any segregated facilities

Seniority

Formal seniority lines or lists are not maintained. Whenever seniority is used or considered (i.e. vacation accrual, benefit accrual), sex is not a consideration.

Training Programs

While some limited training is provided, employees are encouraged to pursue additional education and training through external sources. On occasion, employees are provided an opportunity or are scheduled to attend relevant in-house or external seminars and training. All training, whether internal or external, is encouraged by Tetra Tech in a non-discriminatory manner.

Technical Phases of Compliance

1. All appropriate bulletin boards are posted with applicable equal employment opportunity literature and regulations.

2. All subcontractors are notified of their obligations under Executive Order No. 11246 as amended, as well as, Revised Order No. 4.

3. Purchase order forms advise vendors and subcontractors that Tetra Tech is a government contractor and of their obligation to practice EEO and affirmative action.

V. ACTION ORIENTED PROGRAMS
[41 CFR 60-2.17 (c)]

All personnel involved in recruiting, selection, discipline and related processes will receive instruction on an on going basis, regarding Tetra Tech's affirmative action objectives, equal employment opportunity laws, regulations, court decisions, and appropriate job-related management practices.

A. Job Descriptions, Specifications and Requirements

Job descriptions list the minimum requirements for a particular job and are accurate in relating to actual job functions. Tetra Tech will continue to review and revise, when appropriate, employee position titles, qualifications, job specifications and wage/salary rates to assure that they do not have qualifications or other requirements that would tend to screen out or disproportionately or adversely impact upon minorities or females.

Tetra Tech has delegated to its department managers the final decision on hiring, as stated in the section on EEO responsibilities. Yearly reviews will continue to be performed to ensure the elimination of any impediment to full implementation of the EEO Policy and the AAP. The Human Resources Department staff will monitor the attitudes of department management for any adverse attitudes toward EEO and affirmative action, and watch for abnormal rates of rejection for minorities and females.

The Human Resources Staff will be assigned to:

1. Conduct an analysis of position requirements and/or descriptions to ensure that they accurately reflect position functions and are consistent for the same position from one department to another.

2. Evaluate new or modified worker specifications for each job classification by department, using job performance criteria. Specifications will be consistent for the same job classification in all locations and free from bias with regard to race, color, age, religion, sex, and national origin. If any requirements screen out a disproportionate number of minorities or females, these requirements will be carefully evaluated with respect to their relationship to actual job performance and business necessity.

3. Make available approved position descriptions, whether such descriptions have been formalized in writing or not, and worker specifications to all members of management involved in the recruiting, screening, selection and disciplinary processes; and, distribute appropriate copies to recruitment sources.

B. Recruitment Practices

To enhance the likelihood of recruiting minority and female employees, Tetra Tech will contact appropriate State agencies and solicit names from management of appropriate minority and female groups, associations and institutions which can refer qualified applicants for positions in job groups which have an underutilization of minorities or females. Additionally, each qualified applicant is identified by: name, ethnicity, gender, veteran and disabled status, positions applied for, recruitment source, referral source, and final disposition.

The Human Resources staff will be assigned to ensure the following types of recruitment activities:

1. Include the phrase "Equal Employment Opportunity" (EEO) and/or "Affirmative Action" employer (EEO/AA) in all printed employment advertisements.
2. Place appropriate job opportunities in minority and female publications or minority and female Internet web sites.
3. Disseminate information on job opportunities and Tetra Tech's affirmative action objectives to organizations representing minorities and females, and employment development agencies.
4. Actively encourage minority and female employees to refer applicants.
5. Send minority and female employees to participate in "Career Days," Job Fairs and related activities in their communities, when appropriate.
6. Recruit, when appropriate, at secondary schools, junior colleges and colleges with predominantly minority or female enrollments.
7. Ensure that referral agencies that are used, if any, are referring minorities and females in a nondiscriminatory manner.

C. Internal Postings

Current job openings are posted internally in conspicuous areas throughout the facilities where employees congregate. Job postings are updated as positions become available or are filled. This formal "job posting" procedure is utilized to make employees aware of vacancies, and as a means of promoting job opportunity and mobility of current employees through interdepartmental transfers. The method of posting assures fair and equal treatment of all covered employees consistent with affirmative action policies. Evaluation of employees from transfer or promotion is based solely on knowledge, skills, experience, and ability to perform the duties as required by the job.

D. Selection Practices

To assure that no discriminatory practices have entered the selection system, the Human Resources Department will monitor the selection decisions for all job titles in underutilized job groups. As an example, if a vacancy exists in an area identified as being underutilized, it will be the selecting manager's or supervisor's responsibility to provide the Human Resources Department with reasons why qualified minority and female applicants were considered but not selected.

The Human Resources Staff will continue to ensure that the Tetra Tech's selection process is job related. These responsibilities will include:

1. A review of Tetra Tech's job application and other pre-employment forms to ensure that inquiries are job related.
2. Periodic evaluation of the selection policy to ensure that it is free from bias and does not hinder Tetra Tech's ability to attain its affirmative action goals.
3. Periodically evaluate practices to ensure that they are job related and necessary**.**
4. Train personnel interviewers on proper interview techniques, appropriate inquiries, documentation and Tetra Tech's affirmative action objectives.

E. Promotional and Training Practices

Staff will continue to take the following types of action to prepare minorities and females for promotion, and to assist employees in advancing to jobs offering a higher level of responsibility, greater degree of challenge and further opportunity for advancement:

1. When an underutilization exists, advise managers and supervisors of approved vacancies, with the intention of identifying potential minority and female candidates.
2. Make available career counseling to assist employees in identifying promotional opportunities, training and educational programs to enhance promotability and opportunities for job rotation or transfer.
3. When appropriate, offer remedial education, skills training, and work-study programs to assist employees in meeting performance standards and preparing for employment or advancement.
4. Administer an employee performance evaluation program, which is designed to assist employees in meeting performance standards, in a non-discriminatory manner.
5. Evaluate requirements for promotion on job-related criteria and ensure that minorities and females are not required to possess higher qualifications than those of others.
6. When an underutilization exists, require supervisory personnel to explain promotion selection decisions when qualified minority or female employees are among the candidates rejected for advancement opportunities.

F. Management and Disciplinary Practices

In order to increase and/or maintain the representation of minority and female employees throughout the work force, all department heads will be held accountable for monitoring and evaluating their hiring, promotions, transfer and termination practices.

Supervisors and department heads will be responsible for identifying and helping to develop promotion and transfer opportunities for minority and female employees in their departments whenever and wherever an underutilization is identified. In addition, current eligible employees, as well as applicants, will be informed and encouraged to participate in training and educational assistance programs that may be available at or through Tetra Tech, and in the community.

The Human Resources Staff will continue to take the following actions to assist supervisors in meeting their Affirmative Action Program responsibilities:

1. Develop and periodically review forms and management practices such as interviews, employee evaluations, counseling, training and discipline.
2. Offer training to management regarding Tetra Tech's Affirmative Action Program objectives and job-related personnel practices.
3. Monitor disciplinary action to ensure that minorities and females are not being disciplined in disproportionate numbers.

G. Benefits and Rules

Tetra Tech regularly analyzes the wage and benefits program to ensure that no discriminatory practices exist. Wage schedules are not related to or based on the gender or race of employees, but are based on established market labor rates for each classification or specialty.

The Human Resources Staff will be assigned to take the following actions to ensure that Tetra Tech's facilities are desegregated and its benefits programs and rules are nondiscriminatory:

1. Review Tetra Tech's employee benefits plans, coverage and administration procedures to ensure that they do not inadvertently discriminate illegally because of race, color, religion, sex, national origin or age.
2. Review Tetra Tech's work rules to ensure that they do not inadvertently discriminate illegally because of race, color, religion, sex, national origin or age.

H. Management Training

Tetra Tech, Inc. is committed to providing educational training to all the management to ensure that personnel actions and all employment decisions are made in a manner which will further the principle of equal employment opportunity. Tetra Tech, Inc. is committed to assuring that our supervisors and employees are familiar with proper procedures, policies, and practices on affirmative action and harassment training.

VI. INTERNAL AUDIT AND REPORTING SYSTEM [41 CFR 60-2.17 (d)]

A major component of the Affirmative Action Plan is an assessment of the effectiveness of efforts undertaken to achieve goals and objectives. This assessment requires complex record-keeping systems for collecting information about applicants and about the numerous personnel transactions affecting Tetra Tech employees. To meet this goal, an audit and reporting system has been designed which:

1. Assists in measuring the effectiveness of the EEO Policy and the Affirmative Action Program.
2. Indicates those areas where remedial action is needed.
3. Determines the degree to which location goals and objectives have been achieved.
4. Monitors the number of qualified applicants, new hires, promotions, transfers and terminations by race and sex.

This information provides the basis for analyzing personnel transactions for a one-year period and for an annual update of the Affirmative Action Plan. The update includes the predetermination of annual placement goals as well as an assessment of the previous year's annual placement goals and progress made.

Applicant Information. Information about gender and ethnicity of each applicant is collected and maintained for affirmative action reporting purposes. Applicants who wish to benefit under the Affirmative Action Program for Individuals with Disabilities, Special Disabled Veterans or Veterans of the Vietnam era are also invited to self-identify their status after an offer of employment has been made and before employment begins. This information is requested on a voluntary basis and is used only for affirmative action purposes. Information regarding the disposition of each application for each opening is also maintained.

Employee Information. Information is collected and maintained for the following personnel transactions: placements (new hires, promotions, and transfers); merit increases; separations (resignation, death, retirement, and medical); involuntary separations (layoffs and dismissals), and training programs. The information is compiled by job group, by gender and by ethnicity.

This system, which was outlined in the preceding section, Action Oriented Programs, will be used by the facility EEO Coordinator in developing progress reports to management, which will indicate progress toward AAP goals and objectives. Department management will indicate any current or foreseeable EEO and AAP focus areas, and outline corrective action suggestions.

Janet Brunner, Sr. Human Resources Manager, is responsible for discussing any problems related to the implementation of the EEO Policy and this AAP with appropriate management representatives. Discussions will focus on rejection ratios, the underutilization of minorities and females, charges of discrimination or allegations of harassment. There will be yearly audits of the selection and placement process, paying particular attention to hiring, promotion, transfer and termination patterns. A report on the status of this facility's Affirmative Action Program will be prepared, and remedial steps will be taken which are necessary to provide for the effective implementation of the program.

VII. WORKFORCE ANALYSIS
[41 CFR 60-2.11]

Workforce Analysis

In accordance with Federal Affirmative Action Regulations, a work force analysis of employees by department is developed. The analysis consists of a count of employees in each job title in the unit; job titles are ranked from the lowest to highest salary range including supervisors. For each job title the following is provided: the salary range; the total number of incumbents; the total number of male and female incumbents and total number or male and female incumbents by the ethnic categories of American Indian, Asian, Black, Hispanic and Caucasian.

The data is analyzed by reviewing each department and comparing the percent of minorities and women in the department to the percentages in the workforce. If any problem areas exist, programs are developed to correct those areas. These programs are described in the "Action Oriented Programs." section.

VIII. JOB GROUP ANALYSIS
[41 CFR 60-2.12 AND 60-2.13]

Job groups are the basic units for developing availability proportions, conducting the utilization analysis, and analyzing personnel transactions. In accordance with Federal affirmative action regulations, the different job titles held by Tetra Tech employees have been combined to form the job groups listed in the AAP reports section.

Methodology

Federal affirmative action regulations specify that job groups have similar content, wage rates, and opportunities. Accordingly, in developing the job groups, the following guidelines were taken into consideration:

- The contents of the jobs included in a job group should be similar in job responsibilities, requisite skills, and wage rates.
- The opportunities for advancement should be similar for all jobs in a job group.
- A given job group should not include job classifications with clearly different utilization patterns. For example, job classifications predominantly filled with males should not be combined in the same job group with job classifications predominantly filled with females.
- Job groups, in general, should be composed of a minimum of ten employees to allow meaningful utilization analysis and the establishment of goals. In some cases, job groups of less than ten employees may be necessary because of unique job content, requirements, location, and skills.
- Job groups should illuminate, rather than mask, focus areas.
- Feeder jobs for jobs included in a job group should be similar.
- Jobs in a job group should have the same labor market.

In accordance with Federal Affirmative Action Regulations, a job group analysis of employees by job group categories with similar content, wage rates and opportunity for advancement is developed. The analysis consists of a count of employees in each job title with similar functions ranked from the lowest to highest salary range including supervisors. For each job group category the following is provided: the salary range; the total number of incumbents; the total number of male and female incumbents and total number of male and female incumbents by the ethnic categories of American Indian, Asian, Black, Hispanic and Caucasian

IX. FEEDER GROUP ANALYSIS

Below is a table demonstrating the lines of progression and providing an analysis of the job groups by their feeder groups.

Job Group	Feeder Group
1A	1B
1B	2A,2D
2A	3A
2D	5A
3A	No Feeder
5A	5B
5B	No Feeder

X. AVAILABILITY ANALYSIS
[41 CFR 60-2.14]

In accordance with Federal affirmative action regulations, Tetra Tech, Inc. has conducted an availability analysis of the employment of females and ethnic minorities by job group. To perform this availability analysis based on the guidelines outlined in the OFCCP's Federal Contract Compliance Manual and in pertinent parts of 41 CFR, Chapter 60, proportions of available females and ethnic minorities for each job group are developed.

Availability is defined as the percentage of minorities and women among those persons who are eligible currently or will be eligible during the term of the affirmative action program.

As specified in federal affirmative action regulations, two factors are considered in determining the availability proportions of females and ethnic minorities for each job group. These two factors are set forth below. In determining whether minorities and females are underutilized, Tetra Tech has considered the following data: *

1. The availability of minorities/females having requisite skills in an area from which the location can reasonably recruit.
2. The availability of promotable and transferable minority/female employees within the facility during the AAP year.

Data sources for external availability factors for our computations have been acquired from the U.S. Census Bureau.

* The charts used for the computation of availability percentages are in the AAP reports section.

XI. UTILIZATION ANALYSIS
[41 CFR 60-2.15]

In determining whether areas of underutilization exist and what steps might be taken to correct the deficiencies, an analysis was performed in accordance with Order No. 4. This utilization analysis considered the results of the Availability Analysis conducted in this plan. By using this data and by applying the measure of reasonableness, we have determined that some underutilization of minorities and/or females exists. The utilization analysis is in the AAP reports section. The results of the utilization analysis are the basis for establishing the goals described in this document.

XII. GOALS
[41 CFR 60-2.16 AND 60-2.17(B)]

At the beginning of a reporting period, annual goals are established for females and ethnic minority categories in job groups where underutilization is identified and is equal to or exceeds one person or more. For the 2014 Tetra Tech Affirmative Action Plan these goals are expressed as annual placement rates equal to availability proportions based upon 2010 census data. The goal is met if the actual placement rate is equal to or exceeds the availability rate.

Annual goal attainment for those instances where underutilization was identified at the beginning of the reporting period is assessed at the end of a reporting period by taking into account the applicable annual placement rates and actual experience of employee promotions, transfers, and hires. The assessment is made on the basis of comparing the placement rate by gender or ethnic minority category in the job group to the applicable availability proportion.

The 2014 goals are based on our workforce numbers staying the same. Primarily, openings will result from normal attrition and, in some cases, the vacancies may not be filled. These goals reflect current business conditions and are subject to change as these conditions change.

Our long range goal is to overcome underutilization in all job categories and to employ percentages of minorities and women at least equal to the percentages of qualified minorities and women within the available labor force.

Tetra Tech, Inc. will continue to develop and maintain programs that facilitate the attainment of the goals that have been set to increase the utilization of minorities or females. The following program will be implemented for job groups identified as underutilized:

When an underutilization is identified for a specific job group, Janet Brunner, Sr. Human Resources Manager, will make an annual review of the employee selection process, to ensure that any practices or policies which could result in a disproportional number of minorities and/or females being rejected for employment are kept out of the selection process.

APPENDIX A » KEY STAFF RESUMES

STEVE EVANS

Years of Experience: 13

Education: M.A., Education, Georgetown College, 2004; B.S., Biology, University of Kentucky, 2001

Professional Memberships and Associations: Kentucky Academy of Science; Association of Southeastern Biologists; Southern Appalachian Botanical Society; Botanical Society of America

Professional Experience/Areas of Expertise

Steve Evans is an environmental scientist / biologist for Third Rock. He has proven himself invaluable to our staff through his versatility and ability to tailor his biology expertise and capabilities to a variety of applications. Coming from a strong laboratory background where quality assurance is key, Steve has taken that attention to detail and knowledge and applied it to a broad range of environmental consulting projects. With experience including watershed planning, water quality analysis, forest invasive control and restoration, plant species and community identification, and statistical analysis, he is well suited to compile and analyze data, and project long-term strategies for watershed planning.

Municipal Stormwater Program Consulting

Steve has worked extensively as part of a team of consults to provide technical expertise to Lexington-Fayette Urban County Government (LFUCG) for implementation of their municipal stormwater program and compliance with Consent Decree/ MS4 permit requirements. Steve has specialized technical experience using statistical and other science-based methodologies to understand large amounts of watershed-scale water quality data and reach valuable conclusions that can guide stormwater program management and resource remediation. Specifically, Steve has analyzed current and historic data from LFUCG's stormwater monitoring program for each of Lexington's seven watersheds in order to determine overall stream health and water quality trends in these streams. Steve was lead author of a comprehensive evaluation of LFUCG's stormwater monitoring program data from 1999 to 2013.

Steve authored and implemented a report template to define the content and format of "watershed assessment reports" for LFUCG. He further authored or reviewed watershed assessments for six of the seven major watersheds. These assessments identify and delineate the content of a document that will fully characterize the background information available on a watershed, including identification of potential stakeholders, gathering all technical data, determining existing watershed management activities, performing an analysis of the watershed health based on monitoring data, and identifying any water quality data gaps or collection needs.

Additionally, Steve has developed and will implement an extensive Water Quality Program Training Module that includes basic information about LFUCG's Stormwater program, protocols for educating LFUCG's employees on monitoring procedures, safety protocols, sample handling and preservation, and record keeping that should be used when sampling LFUCG's streams.

Watershed Planning

Because Steve has comprehensive experience at field sampling and design planning, laboratory analysis, data analysis, and community coordination, he is uniquely qualified to produce watershed analysis and planning documents. Steve has worked with nonprofit organizations, municipal, state, and federal agencies to produce watershed plans, such as for the Hanging Fork and Clarks Run watersheds in Boyle and Lincoln Counties, KY and the Wolf Run Watershed for Lexington-Fayette Urban County Government, in Fayette County, KY. He is currently managing the production of a watershed plan for Chestnut Creek in Marshall County, Kentucky. These public documents compile all available water planning documents, monitoring data, and landuse information in order to identify impairments and protect healthy waterways. They also provide coordinate and scheduling of implementation plans and funding to ensure watershed goals are met. As the lead author of the Kentucky Statewide Assessment of Forest Resources and Strategy, he was also able to aid in the

establishment of strategies to protect, enhance, and restore both resources.

Water Quality Monitoring

Steve conducts and designs aquatic biological assessments consisting of field water quality testing using various water quality meters, field collection of surface water samples, and habitat assessment. His intimate knowledge of sample collection and preservation techniques ensures efficient sampling strategies. For stormwater sampling in association with the EPA Consent Decree for the Lexington-Fayette Urban County Government (LFUCG), Steve advised the project team on sampling parameters, coordinated sampling logistics, collected grab and composite samples as well as flow measurements during multiple dry, wet weather, and storm events from the municipal waste facilities, major watersheds, and the urban expansion area. Recently, he authored an update to Lexington's SWQMP's Water Quality and Biological Sampling Plan to incorporate updated sampling methodology and quality practices

As part of several Cumulative Impact Assessments for HUC-8 watersheds in Eastern Kentucky recently prepared for use in litigation, Steve prepared a Quality Assurance Project Plan to use in quality training for multiple consulting groups, authored water quality assessment of the Upper Levisa watershed with analysis of historic data from 1930s to the present, review of multiple statistical analyses of the relationship between macroinvertebrate samples, stream health, and environmental variables.

Bacterial Source Tracking

In response to an increasing need to identify the sources of fecal contamination in watersheds, Steve has extended the scope of Third Rock's environmental services to include microbial source tracking consulting and bacteriological analysis. Microbial source tracking methodologies go beyond the enumeration of pathogen water quality indicators and indicate the host source of the pathogen input. This information is crucial for watershed coordinators to effectively plan remediation activities or to provide due diligence for TMDL studies. In the Dix River Watershed, Steve directed remediation from cattle to humans due to source tracking analyses correctly identifying the primary source of fecal pollution in the rural watershed. He has developed procedures to enable Third Rock to perform testing for analysis of Total Coliforms by Standard Method 9222B, Fecal Coliforms by 9222D, and *E. coli* by EPA method 1603. He joined the University of Kentucky in conducting a microbial source tracking analysis of the West Hickman Watershed in Lexington, KY. Steve has presented to numerous audiences on the applications and limitations of microbial source tracking.

Statistical Analysis

Steve is well versed in the application of non-parametric multivariate ordination techniques used in ecological assessments, including PCORD. He actively consulted Kentucky's Division of Water in the development of their COMPASS data reporting system. This system allows both laboratories and consulting firms to report data to the division using Microsoft Access templates. With experience in both the laboratory and consulting aspects of data management and the quality control thereof, Steve acted as a primary contact for the development of the COMPASS system and has led Third Rock to be the first commercial enterprise to submit results using this system.

Quality Assurance

Steve has extensive experience in quality assurance and control and in the development of standard operating procedures and quality assurance plans. Prior to joining Third Rock Steve served as the Laboratory Director and Quality Assurance Manager at Microbac (formerly EnviroData Group) where he successfully developed a quality assurance manual and cause analysis procedures that were adopted at the Microbac corporate (national) level, and overhauled most of the EnviroData Group quality system. At Third Rock, Steve has developed multiple US EPA and Kentucky Division of Water approved Quality Assurance Project Plan's (QAPP) for grants as well as wastewater permits and served as the Quality Assurance Officer on the projects. The project QAPPs served as the central document to establish the quality standards and procedures to be utilized in the project and provided the organization for the successful completion of the projects.

GERRY FISTER, P.G.

Years of Experience: 26

Education: B.S., Geology, University of Kentucky, 1987

Professional Registrations and Licenses: Professional Geologist, Kentucky, #0527, 1993

Professional Memberships and Associations: Kentucky Association of Professional Geologists; Geological Society of America

Specialized Training:

OSHA 8-hr Annual Haxwoper Refresher, Sharon McCreadie, Instructor, Association of Bay Area Governments, Annual

Geohazards in Transportation in the Appalachian Region, Kentucky Geological Survey, 2006

Sinkholes and the Engineering and Environmental Impacts of Karst, National Ground Water Association, 2003

Symposium on Geophysics and Environmental Problems, Environmental and Engineering Geophysical Society, 2000

Professional Experience/Areas of Expertise

Gerry Fister is the contract administrator and/or project manager for a variety of projects at Third Rock. He has a clear understanding of the staffing needs, technological applications, and complexities of the process for water quality projects. He serves as the primary point of contact with the firm owner and ensures that Third Rock staff has the support and resources available to produce high quality deliverables within the project schedule.

Gerry has an extensive understanding of the regulations governing environmental quality and permitting. With his knowledge of a wide range of regulatory programs, and a broad background in the application of environmental science make him a valuable asset to Third Rock's clients. His expertise in the application of environmental science enables our firm to meet client needs. Gerry spearheaded the effort at Third Rock to train all project administrators in ArcView® GIS. Using GIS technology, he has maximized project efficiency by being able to organize multiple sources of data (such as geologic maps, topographic maps, aerial photographs, sampling points and results, etc.). Gerry has managed a wide range of project types including statewide environmental contracts for the Kentucky Transportation Cabinet (KYTC), Tennessee Department of Transportation, and the Kentucky Finance and Administration Cabinet. As part of his project management responsibilities for that contract, For the Kentucky Finance and Administration Cabinet, Gerry has managed projects at National Guard posts, state parks, state maintenance facilities, and other state facilities. .

Hazardous Materials Assessment

Gerry is our company's leading underground storage tank and hazardous materials specialist. He has over 20 years of experience with data-gathering techniques, federal and state environmental regulations, walkover inspections, windshield surveys, site mapping techniques, surface geology elements, and technical writing. His experience includes all aspects of the Phase I and II Environmental Site Assessment process including assessments for individual sites as well as multiple sites for such undertakings as linear transportation projects. He has served as principle investigator, inspecting site for presence of environmental hazards, including underground storage tanks and hazardous materials for dozens of site development projects throughout Kentucky, Ohio, and Tennessee. He is currently completing a Corrective Action Plan for the Southend Park site as part of the Newtown Pike Extension Project in Lexington, Kentucky.

He has completed arsenic investigations, landfill evaluations, soil and groundwater assessments, petroleum spill evaluations, and more. Recently, he was involved in the planning efforts regarding the existing I-75 (Brent Spence) bridge between Covington, Kentucky, and Cincinnati, Ohio, assessing the feasibility and constructability of several bridge replacement/rehabilitation options.

Gerry has combined his Phase I and II experience with an extensive understanding of regulations governing the NEPA process. He specifically has a detailed working knowledge of the transportation process as it relates to hazardous materials having working on a long list of projects throughout Kentucky, Ohio and Tennessee.

Prior Professional Experience

Gerry held a staff geologist position with Fuller, Mossbarger, Scott, and May Civil Engineers from 1987 to 1988. His primary responsibility was directing drilling activities for a geotechnical investigation related to the expansion of the Winfield Locks and Dam on the Kanawha River in West Virginia. His duties included inspecting monitoring well installation, piezometer installation, continuous soil sampling, rock coring, and shelby tube collection. This experience laid the foundation for the future application of subsurface investigation methods to the environmental field.

From 1988 through 2000, Gerry was a project manager for Commonwealth Technology, Inc. His responsibilities included managing a variety of projects requiring a detailed understanding of regulatory environmental programs under the Clean Water Act, Resource Conservation and Recovery Act, National Environmental Policy Act, Comprehensive Environmental Response Compensation and Liability Act, Toxic Substance Control Act, and state and local regulatory programs. In this capacity, he designed and directed more than 300 site investigations involving the sampling and characterization of all environmental media. Investigative techniques he used included applying conventional technologies and methods as well as conducting groundwater dye trace studies; seismic, magnetic, and soil vapor surveys; and other geotechnical methods. He completed over 700 Phase I Environmental Site Assessments (ESAs) for real estate transactions. In many cases, he completed both Phase II and Phase III ESAs defining the extent of the environmental liability and implementation of corrective action. Gerry directed client services for a number of Kentucky state agencies including the Kentucky Transportation Cabinet and the Finance and Administration Cabinet. KYTC services included the identification and clearance of a wide variety of environmental problems on acquired highway right-of-ways. The Finance and Administration services included similar services at state facilities such as state parks or National Guard posts.

JOHN KOSCO, P.E., CPESC

Education: M.S., Civil / Water Resources Engineering, George Washington University, 1997; B.S., Agricultural Engineering, Pennsylvania State University, 1992

Years of Experience: Total: 22; With Tetra Tech: 13

Key Areas of Experience: Clean Water Act support; stormwater control; Phase I and Phase II program support

Mr. Kosco has 22 years of experience with stormwater and nonpoint source controls, having worked at U.S. Environmental Protection Agency (EPA) Headquarters for 9 years as an engineer and project manager and at Tetra Tech for 13 years. Mr. Kosco is a Senior Water Resources Engineer specializing in National Pollutant Discharge Elimination System (NPDES) stormwater permitting for EPA, state, and local clients. He has extensive experience conducting evaluations of municipal stormwater Phase I programs and developing stormwater permits and programs. While at EPA, he was one of the coauthors of the stormwater Phase II regulation published in December 1999 and provided most of the engineering and technical support for this rule.

EXPERIENCE

EPA Stormwater Rule Support (EPA OWM/WPD) – Served as project manager and lead technical support for U.S. EPA's stormwater rulemaking effort. Led a team that developed technical analysis on impacts to small streams and benefits of reduced detention basins. Managed support for six onsite public listening sessions and a four-hour webcast, including facilitating two of the sessions. Managed a team to organize and summarize over 200 public comments received in response to a Federal Register Notice. The comments were organized by topic and uploaded into an online database. Led the development of a 40-page document that summarized all comments.

EPA Green Infrastructure Technical Assistance (EPA OWM/WPD) – For EPA Office of Water, co-leading a team of Tetra Tech staff to provide technical assistance on green infrastructure to municipal governments. Providing oversight on approximately 20 projects that include conceptual designs,

technical guidance development, code and ordinance reviews, and benefits assessments.

MS4 Permit Improvement Guide (EPA OWM/WPD) – Project manager and lead technical author of EPA's MS4 Permit Improvement Guide which provides clear and consistent on how permit writers should develop MS4 permits. The guide contains examples of permit conditions and supporting rationale that could be used in fact sheets that accompany NPDES permits. Reviewed existing MS4 permit requirements and developed example permit language that was measurable and clear. Worked closely with EPA to address State and EPA comments on the guide.

MS4 Program Evaluation Guide (EPA OWM/WPD) – Primary author of EPA's MS4 Program Evaluation Guide, which is EPA's guide on how NPDES permitting authorities should conduct audits and inspections of MS4 programs. Developed a series of questions and checklists for inspectors to use during audits. Conducted training of EPA and state staff on how to conduct an effective MS4 program evaluation.

Municipal Stormwater Post-Construction Guide (EPA OWM/WPD) – Managed and served as co-author of the guidance document *Managing Stormwater in Your Community: A Guide for Building an Effective Post-Construction Program*. This guide, developed jointly with the Center for Watershed Protection and published as a CWP document, provides information on the various program components municipalities should address to develop a post-construction program. Mr. Kosco was lead author for several chapters and managed a diverse group of staff in developing the guide.

EPA Industrial SWPPP Guide (EPA OWM/WPD) – Served as primary author of EPA's Developing Your Stormwater Pollution Prevention Plan: A Guide for Industrial Operators. Drafted all text for the 40 page guide, including SWPPP tips and "what to include in your SWPPP" sections. Developed a SWPPP template and MSGP documentation template to assist industrial operators in developing and implementing a SWPPP that complies with the guide.

EPA Construction SWPPP Guide (EPA OWM/WPD) – Served as primary author of EPA's *Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites*. Developed the outline and wrote the majority of the text in the guide. Drafted a series of steps to help simplify the SWPPP development process for construction operators. This included identifying key principles for selecting appropriate erosion and sediment controls, pollution prevention controls, and post-construction controls. Also developed a SWPPP template for construction operators to use in writing SWPPPs, and created a sample inspection report.

EPA Stormwater Webcasts (EPA OWM/WPD) – Served as the moderator and occasional subject matter expert for at least 25 of EPA's stormwater webcasts. Supported EPA by identifying stormwater webcast topics and speakers, reviewing presentations, screening questions during the webcast, and preparing the materials for posting on EPA's webstie. About 29 webcasts were held, with an average of 1,500 people participating in each live webcast. Served as an expert speaker for a webcast on municipal stormwater compliance in March 2007.

Stormwater Phase I MS4 Evaluations (EPA R9) – As manager of a project to assess the compliance of numerous stormwater Phase I permit programs in California, Nevada, Hawaii, and Arizona, leads a team of inspectors who conduct both a programmatic review of the MS4s stormwater-related programs and an in-field verification of how selected elements of the program are actually implemented. Over 45 programs have been reviewed, consisting of over 110 permittees. A final report on each MS4 evaluation is developed for each state to assist the state in targeting its effort to the major problem areas in each MS4.

Alaska DEC Storm Water Guide (ADEC) – Primary author of two chapters of the *Alaska Storm Water Guide* – Chapter 4 on Temporary Storm Water Controls and Chapter 5 on Permanent Storm Water Controls. This included drafting BMP principles, identifying BMPs and adapting their design criteria to adjust to the unique climates in Alaska.

Stormwater Training for the State of California (CA SWRCB) – Managed a project to develop three 2-day training courses for state water quality staff in California. These courses, focusing on how to review stormwater management plans, how to conduct an

on-site MS4 evaluation, and how to write an MS4 permit, were held in the first half of 2004. Served as primary author of the training materials and lead instructor. In addition, developed an MS4 Audit Guide as a reference for the course on MS4 evaluations.

Stormwater Permit Development for the State of Hawaii (Hawaii DOH) – Developed draft permit language for the Hawaii Department of Transportation MS4 permit and the City/County of Honolulu MS4 permit. These permits were drafted after conducting on-site evaluations of each program with permit conditions included to address deficiencies identified during the evaluation.

Arizona DEQ Stormwater Training (ADEQ) – Developed and was the lead instructor for a 3-day stormwater training course for state staff in Arizona. The training covered all aspects of the stormwater program, including construction, industrial and municipal sources. In addition, the training addressed regulatory requirements, drafting permits, and inspection/compliance techniques. The training wrapped up with mock inspections of a construction site and an industrial facility.

Minnesota Construction Site Guidance (MPCA) – Managed a project to develop an inspection guide and compliance assistance information for small construction operators in Minnesota. The inspection guide provides specific information on how to conduct a stormwater inspection for local construction inspectors. The compliance assistance information for small construction operators steps small construction operators through the process of complying with the State's general construction permit and developing a stormwater pollution prevention plan.

Stormwater Design Manual (Pulaski County, AR) – For Pulaski County, Arkansas, served as primary author of the Stormwater Management and Drainage Manual for the Lake Maumelle Drainage Basin which provides guidance on site planning and stormwater practice design criteria necessary for meeting specified surface runoff loading rate criteria. Worked closely with County staff and other stakeholders in development of the manual. Developed both erosion and sediment control requirements and BMPs, along with standards for 10 typical stormwater management BMPs. Also drafted an Erosion and Sediment Control Field Guide based largely on material in the manual.

BERT REMLEY

Years of Experience: 20

Education: M.S., Biology, Morehead State University, 1997; B.A., Anthropology, University of Kentucky, 1991

Professional Memberships and Associations: Society for Freshwater Science; American Fisheries Society - Kentucky Chapter; Carolina Area Benthologists; Freshwater Mollusk Conservation Society

Specialized Training

Macroinvertebrate Sampling in the Eastern Kentucky Coalfields Training, Kentucky Division of Water, 2012

Ecological Training, Timothy M. Hill, Instructor, Ohio Department of Transportation, 2011

Wetland Delineator Certification Program, 2009

River Morphology & Applications Course, Dr. Dave Rosgen, Instructor, 2009

Benthic Macroinvertebrate Assessment – Sample Collection, Identification, and Data Evaluation, Ohio Environmental Protection Agency, (QDC #00837) 2003

Developing a Biological Assessment, US Fish & Wildlife Service, 2007

Applied Fluvial Geomorphology Course, Dave Rosgen, Instructor, Pilot View Resource Conservation & Development, 2007

Soil Erosion & Sediment Control, Danny Jasper, P.E., Kentucky Society of Professional Engineers, 2007

Eastern and Western Kentucky Headwater Stream Functional Assessment Protocol, Louisville District, United States Army Corps of Engineers, 2006

Advanced Midge Identification, Association of Mid-Atlantic Biologists Workshop, 2006

Stream Restoration in the Southeast: Accomplishments and Opportunities, North Carolina Stream Restoration Institute, 2006

Floodplains, Riparian Zones, and Buffer Strips: Key Components to Aquatic Life Use Attainment and Self-Sustaining Stream Systems, Soil and Water Conservation Society, 2006

Taxonomy and Identification of Darters, Association of Mid-Atlantic Aquatic Biologists Workshop, 2005

Canaan Valley Institute, Association of Mid-Atlantic Aquatic Biologists Workshops, 2005

Larval Fish Identification, Ed Hartowicz, Instructor, Third Rock Continuing Education, 2004

Laboratory QA/QC for Benthic Macroinvertebrate Sample Processing and Taxonomic Identifications, Mid-Atlantic Water Pollution Biology Workshop, Mid-Atlantic Environmental Protection Agency, 2003

Asteraceae Identification, Ron Jones, Instructor, Eastern Kentucky University, 2002

Water Beetle Taxonomy & Identification, John H. Epler, Ph.D., Instructor, Duke Power Environmental Center, 2002

Aquatic Insect Collection Protocols Workshop for Stream Mitigation & Restoration, Dave Penrose, Instructor, North Carolina Department of Environment & Natural Resources, 2001

Oligochaetes Identification, Carolina Benthological Workshop, 2001

Crayfish Workshop, Carolina Benthological Workshop, 2001

Aquatic Entomology, Eastern Kentucky University, 2000

Biology and Identification of Southeastern Mayflies, Stoneflies, and Caddisflies, Clemson University, 2000

Professional Experience/Areas of Expertise

Bert Remley has been sampling streams in Fayette County each year since 1998. He is Third Rock's senior aquatic biologist and is the Quality Control/Quality Assurance Officer for Third Rock's aquatic biology laboratory. In addition to macroinvertebrate taxonomy, Bert also conducts stream sampling for aquatic macroinvertebrates, fish, plankton, and freshwater mussels. He is experienced in the identification and ecology of aquatic macroinvertebrates and fish of the region, conducting surveys in Kentucky, Ohio, Indiana, Illinois, Tennessee, West Virginia, Virginia, South Carolina, and North Carolina. Bert has also conducted hundreds of biological assessment for threatened and endangered species in Kentucky and Tennessee including numerous bat, fish, and mussel species. As a PADI certified open water diver and part of Third Rock's dive team, he has led numerous mussel surveys.

Fish

Bert has surveyed streams, rivers, and lakes for fish in Kentucky, Virginia, Tennessee, Ohio, and Illinois. He has employed several different sampling techniques including backpack electroshocking, boat mounted electroshocking, seining, and gill netting. Bert participated in surveying the fish communities of Pools 9 and 10 of the Kentucky River and their respective tributaries. Bert was lead biologist of a fish inventory of Cumberland Gap National Historical Park. All streams within the park that contained fish were surveyed, including Davis Branch, which contains the federally threatened blackside dace (*Chrosomus cumberlandensis*). In addition to this survey, Bert has conducted blackside dace surveys in several streams in southeastern Kentucky for coalmine permits and utility crossings. During a 2013 fish survey, Bert captured and identified blackside dace in a tributary to the Kentucky River in Perry County, KY. This was the first documented occurrence of blackside dace in the Kentucky River drainage and was verified by USFWS and KDFWR personnel. Bert has also surveyed for and collected the federally endangered relict darter (*Etheostoma chienense*) within the Bayou du Chien watershed. He has conducted numerous fish surveys in streams throughout the state for KPDES permits and biological assessments.

Macroinvertebrates

Bert has collected thousands of samples from the southeast and midwest employing several different sampling protocols. He has been certified by the Society for Freshwater Science to identify eastern midges (Chironomidae), mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera) and general arthropods to genus level. He is also a certified Level 3 Qualified Data Collector by the Ohio EPA to collect, identify, and calculate

macroinvertebrate community metrics in Ohio. Similarly, he is certified to collect benthic macroinvertebrates for 401 certification projects in North Carolina. Bert has collected macroinvertebrate samples for the United States Army Corps of Engineers (USACE) Louisville District, Louisville Metropolitan Sewer District, and Lexington Fayette Urban County Government. Bert has also collected and identified macroinvertebrate samples in Tennessee following Tennessee Department of Environment and Conservation protocols.

Bert is the QA/QC officer for Third Rock's macroinvertebrate lab. He is responsible for calculating macroinvertebrate bioassessment indices, assisting taxonomist with their identifications, managing samples within the laboratory, reviewing and reporting data. Bert has personally identified over 2,000 samples from 10 different states within the southeast, midwest, and pacific northwest. Recent clients Bert has performed macroinvertebrate identifications for include the North East Ohio Regional Sewer District, West Virginia Department for Environmental Protection (WVDEP), USACE Louisville District, Mississippi Department of Environmental Quality (MSDEQ), ORSANCO (Ohio), Louisville Metropolitan Sewer District (MSD), Sevier Stormwater Group, Tennessee Department of Environment and Conservation, United States Environmental Protection Agency, and numerous private clients.

Water Quality Monitoring

Bert's thesis in graduate school dealt with the effects of water quality and fish production. His thesis involved weekly collections of water samples and physiochemical data. He performed all laboratory analysis of the water samples, identification of zooplankton and phytoplankton samples, and analyzed the data. Bert has performed bi-annual water quality sampling and evaluation on reservoirs and streams for Lexington Fayette Urban County Government since 1998. Additionally, Bert collected vast numbers of water chemistry samples and physiochemical data from Pools 9 and 10 of the Kentucky River and their tributaries. He also routinely collects water quality samples for KYTC and coal mining projects. Bert also assists with the maintenance and calibration of Third Rock's water quality instruments. Bert has also completed hundreds of habitat assessments on streams in the Southeast and Midwest following Rapid Bioassessment Protocols.

Prior Professional Experience

From August 1992 to May 1993, Bert worked as a Wildlife Aide for the Kentucky Department of Fish and Wildlife Resources. He assisted the Upland Game Coordinator with the Ruffed Grouse restoration project and was also a member of the mobile deer trapping crew. During the summer of 1994, Bert served as a research assistant for doctoral students at Archbold Biological Station Lake Placid, Florida. From August 1998 until March 2000 Bert worked as a biologist within the biomonitoring division of Envirodata Group, LLC. He conducted acute and chronic toxicity tests using both freshwater and marine vertebrate and invertebrate species. He performed microscopic identifications of phytoplankton, zebra mussel veligers, and unidentified particulate samples. Bert conducted macroinvertebrate sample processing.

JENNIFER SHELBY, P.E., CPESC

Years of Experience: 15

Education: Ph.D. Candidate, Biological Engineering, North Carolina State University; M.S., Biological Engineering, North Carolina State University, 2002; B.S., Biosystems and Agricultural Engineering, University of Kentucky, 1998

Professional Registrations and Licenses: Professional Engineer, Kentucky, #25763; Professional Engineer, Tennessee, #112264; Professional Engineer, Illinois, #62.063125; Certified Professional in Erosion and Sediment Control (CPESC), #4006, 2007

Professional Memberships and Honors: Kentucky Society of Professional Engineers; American Society of Agricultural and Biological Engineers; Kentucky Leadership PE Class of 2008–2009

Specialized Training

Stream Restoration Design Training, Canadian Rivers Institute, University of New Brunswick, Dr. Robert Newberry, 2014

Levels I-IV of Rosgen Training (River Restoration and Natural Channel Design, River Assessment and Monitoring, River Morphology and Applications, Applied Fluvial Geomorphology), Wildland Hydrology, Dr. Dave Rosgen, 2007-2008

RIVERmorph Stream Restoration Software Training, RIVERmorph, LLC/ Wildland Hydrology, 2008

FLOWSED/POWERSED Sediment Transport Modeling Training. RIVERmorph, LLC/ Wildland Hydrology, 2008

Stream Restoration, Dr. Greg Jennings, P.E., North Carolina State University, 2003

Stream Restoration in the Southeast: Innovations for Ecology, NCSU Stream Restoration Program, Wilmington, NC, 2012

Stream Restoration in the Southeast: Advancing the Science and Practice, NCSU Stream Restoration Program, Asheville, NC, 2008

Stream Restoration in the Southeast: Accomplishments and Opportunities, NCSU Stream Restoration Institute, Charlotte, NC, 2006

Watershed-Based Planning Workshop, Kentucky Waterways Alliance, 2006

Stream Ecosystem Restoration Training, River Institute, Ohio, 2006

Professional Experience/Areas of Expertise

Jennifer has dedicated her career to the enhancement of environmental quality, including nonpoint source pollution and stormwater management, watershed-scale assessment of hydrology and water-quality, green stormwater infrastructure planning and design, environmental permitting, and stream and wetland restoration. Having worked in Kentucky, Tennessee, and North Carolina, she is experienced with developing and implementing watershed-scale monitoring schemes and assessing the data produced, as well as designing and constructing large-scale stream and wetland restorations. Her role as a water resources engineer also includes management of environmental projects.

Municipal Stormwater Program Consulting

Jennifer has worked extensively as part of a team of consults to provide technical expertise to Lexington-Fayette Urban County Government (LFUCG) for implementation of their municipal stormwater program and compliance with Consent Decree / MS4 permit requirements. Jennifer has specialized experience assimilating vast amounts of varied water quality data and presenting it to technical and non-technical audiences. She has used appropriate statistical and graphical analyses to extract valuable conclusions from LFUCG's stormwater monitoring program data for each of Lexington's seven watersheds. Jennifer authored and implemented 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.

Watershed Assessment and Water Quality

Jennifer has worked both in Kentucky and North Carolina on watershed-scale monitoring projects. Jennifer was part of a team of Third Rock engineers, planners, and ecologists that prepared a Watershed

Plan for the highly urbanized Wolf Run watershed for Lexington-Fayette Urban County Government (LFUCG). This effort included extensive review of existing watershed data, planning a monitoring scheme to collect additional data, and ultimately analyzing the data to support the development of an action plan for remediation projects within the watershed. Jennifer lead efforts to assess stream hydrogeomorphic condition and rate of stream change as a way to characterize the effects of hydromodification within the Wolf Run watershed. Permanent cross-sections, longitudinal profiles, and substrate analysis were established at nine monitoring stations throughout the watershed and were used to evaluate how the stream is physically changing, particularly under the modified flow regime of this highly urbanized watershed.

Jennifer also had an integral role in planning and implementing watershed-scale monitoring schemes in the Corbin City Reservoir (Laurel River) and Herrington Lake (Dix River) watersheds in central Kentucky. These projects included field assessments and monitoring of streams across the entire watershed for physical and biological characteristics, flow, water quality (nutrients, pathogens, sediment), and water chemistry (pH, conductivity, temperature, dissolved oxygen). Following field data collection, extensive data analyses were performed to determine and rank water pollution sources and recommend solutions to protect and remediate valuable water resources. Following the monitoring of the Corbin City Reservoir watershed, Jennifer and colleagues authored a Watershed Plan based on EPA criteria for the Kentucky Division of Water. Jennifer also contributed to the production of a nutrient TMDL for Clarks Run and Hanging Fork, streams within a developed portion of the watershed. This included the use of the QUAL2K water quality model for predicting in-stream dissolved oxygen concentration given the pollutant loading and in-stream processes.

Stormwater BMP Planning and Design

Jennifer provided services related to BMP planning, evaluating stream restoration opportunities, and assessing feasibility of those opportunities for a proposed redevelopment of a formerly industrial and commercial area of downtown Lexington into an arts and entertainment district (Distillery District). The project included developing BMPs and restoration activities to improve the quality of a degraded stream, Town Branch, running through the district.

Jennifer has experience in design and construction oversight for “green” stormwater best management practices, including bioretention areas, water quality swales, and stormwater wetlands. For example, Jennifer designed and oversaw construction and planting of an approximately 1-acre stormwater wetland using an EPA 319(h) grant for reducing nonpoint source pollution. The stormwater wetland, within Levi Jackson State Park, treats stormwater from an adjacent parking lot and roadway, provides an aesthetically pleasing buffer of native species for the adjacent Little Laurel River, and offers opportunities for community education.

Stream Restoration

Jennifer’s areas of expertise related to stream enhancement and restoration include: field stream geomorphology and stability assessments; natural channel design utilizing Rosgen and other methods; hydrologic and hydraulic modeling to support restoration design; modeling sediment transport to support restoration design; preparation of construction plans and supporting documents; preparation of sediment and erosion control plans; and preparation of federal, state, and local permit applications. Since 2006, Jennifer has performed stream restoration design on five projects for Kentucky Department of Fish and Wildlife Resources projects funded by the state fee in lieu of (FILO) program. These projects include stream geomorphological data collection, natural channel design, 401 and 404 permit application preparation, mitigation plan preparation for the USACE, construction oversight, and post-construction monitoring. Recently, Jennifer performed restoration design and construction oversight for over 7,000 feet of perennial and headwater stream in Boyd County, Kentucky. Currently, Jennifer is involved in the design of more than 16,000 feet of perennial and headwater stream in Casey County, Kentucky. She is also currently leading the design of nearly 30,000 feet of perennial and headwater stream within Lake Barkley State Resort Park in Trigg County, including stream reaches with the State Park Golf Course.

Jennifer's experience also includes completing the necessary assessments and documentation to obtain environmental permits (typically Section 401 and 404 permits) in a timely manner, including identifying necessary permits, coordinating with permitting agencies, completing necessary field assessments, preparing permit applications, and producing thorough mitigation or restoration plans.

Wetland Restoration

Jennifer has been involved in a recent stream and wetland restoration effort on a site bisected by Whitley Branch in London, Kentucky for the City of London using an EPA 319(h) grant to reduce nonpoint source pollution. The project also includes enhancement of Whitley Branch to facilitate a connection to the adjacent floodplain and enhance wetland hydrology and functions throughout the approximately 80-acre site. Background hydrology data was collected on a continuous basis within site to support the restoration design. The design included excavation of niche wetland habitats and creation of surface microtopography to enhance wetland hydrology on the site. The design also includes a site-specific, native planting plan to achieve site stability and long-term function.

Jennifer led design, construction, and hydrology monitoring of a large parcel of prior-converted farmland near Boston, Kentucky. The project included the design, construction, planting (native species), and monitoring of approximately 39-acres of bottomland hardwood and emergent wetlands within a 70-acre site. Background hydrology data was collected on a continuous basis across the site to support the restoration design. The design included enhancement of overbank flooding, placement of berms along low-lying areas and the creation of surface microtopography to enhance wetland hydrology on the site.

Jennifer was also instrumental in the design, construction, and hydrology and water quality monitoring of a 375-acre parcel of prior-converted farmland in North Carolina. The parcel was converted back to wetlands and included stream restoration and creation. This restoration included the elimination of enhanced drainage by filling field ditches and creating an improved stream system, riparian corridor, and floodplain wetlands. The design included 1,900 feet of freshwater stream and over 4,500 feet of tidal creek with significant floodplain wetlands (marsh).

BARRY TONNING

Education: M.A., Env. Risk Communication, Morehead State University, 1994; B.A., Journalism, University of Georgia, 1977

Certifications: Certified Erosion, Sediment, and Storm Water Inspector; Erosion and Sediment Control (KY KEPSC, GA Soil & Water Conservation Commission, Louisville MSD); Kentucky Division of Water Class I Wastewater Treatment Plant Operator

Affiliations: International Erosion Control Association; American Society of Agricultural Engineers; National Onsite Wastewater Recycling Association; Water Environment Federation

Office: Lexington, Kentucky

Years of Experience: 28

Years with Tetra Tech: 11

Mr. Tonning is a senior-level water resource consultant specializing in industrial, construction site, and municipal stormwater management, erosion and sediment control, risk assessment and communication, public health, and technology transfer with extensive experience in training, policy development, and program design. He has directed and managed various stormwater and erosion/sediment control compliance and training programs, environmental and natural resource policy research initiatives, solid waste planning and management programs, decentralized wastewater and nonpoint source pollution assessment and control projects, and watershed planning and management activities.

EXPERIENCE

Industrial and Construction Stormwater Inspections and Audits – Project lead, inspector, stormwater plan developer, and compliance consultant for a 3-year program serving Kiewit Corporation, a major construction contractor based in Omaha. Inspected industrial facilities and construction sites for stormwater compliance, developed construction site and industrial facility Stormwater Pollution Prevention Plans (SWPPPs), conducted compliance audits, and provided

consultation to the company on cost-effective approaches for improving stormwater permit compliance during 2010–2014.

Construction Site Stormwater Audit Inspections and Permit Compliance – Staff consultant and audit program inspector for more than 50 construction site inspections in the City of Lexington (KY), as part of the city's obligations under a federal consent decree related to stormwater program improvements. Conducted inspections, developed a SWPPP template for construction contractors, conducted training programs for city staff and outside contractors, and provided consultation on various stormwater management topics during 2008–2014.

USEPA Stormwater Phase II - National Training Program – Project leader and trainer for a series of USEPA workshops on the Stormwater Phase II program, delivered in Charleston (WV), Philadelphia, Atlanta, Kansas City, Boise, Lexington (KY), and other USEPA Regional Office locations and Phase I and II cities during 2004–2009. Developed and delivered training materials on construction site runoff controls, inspector training, education/outreach, and public participation; led sessions at workshops; assisted in training program review.

USEPA Low-Impact Development Training Modules – Developed training and other materials for USEPA training program on low-impact development during 2005–2006. Researched LID principles, field applications, performance data, and demonstration projects. Created slides and text for workshop presenters, and used the materials personally in presentations related to stormwater management, smart growth, and integrated water resource management.

Indiana Low-Impact Development and Watershed Management Workshops – Created training materials and conducted workshops in northern Indiana on "improving development by design" and watershed assessment, planning, and management during 2006–2007. Presented information on design principles and field application of LID practices, developed and delivered watershed assessment, planning, management workshop, sponsored by regional conservation foundation and local government.

Construction Site Stormwater Field Guide and Technical Manual, KY – Conducted research on construction site erosion, sediment, and stormwater management approaches in various states and localities during 2004–2006; wrote and produced new statewide Field Guide on construction site stormwater runoff control in 2005, co-developed (with Richard Walker of Tetra Tech, Lexington, KY) and produced the new Technical Specifications Manual for the Kentucky construction site stormwater management program in 2006.

Construction Site Inspector Certification Program Development – Provided training materials, slide presentations, instructor services, and consultation for the development of the Kentucky Erosion Protection and Sediment Control inspector qualification program, sponsored by the Kentucky Transportation Cabinet and the University of Kentucky's Technology Transfer Program. Served as one of the first training program instructors, and later developed a separate course covering how to develop a construction site Stormwater Pollution Prevention Plan, and taught those classes during 2010–2013.

Construction Site Stormwater Training, WV – Conducted training workshops on construction site erosion, sediment, and stormwater permit compliance in Hurricane (2008), Beckley (2007), and Charleston (2007, as part of the USEPA stormwater workshop). Conducted all presentations and provided analysis for field trip site reviews, in cooperation with local workshop hosts.

Lake Maumelle Watershed Management Plan, AR – Provided support for construction site erosion and sediment control ordinance development and wastewater treatment options for Central Arkansas Water, which manages Lake Maumelle near Little Rock. Developed portions of local ordinances and SWPPPs.

USEPA Low-Impact Development Training Modules – Developed training and other materials for USEPA training program on low-impact development during 2005–2006. Researched LID principles, field applications, performance data, and demonstration projects. Created slides and text for workshop presenters, and used the materials personally in presentations related to stormwater management,

smart growth, and integrated water resource management.

Indiana Low-Impact Development and Watershed Management Workshops – Created training materials and conducted workshops in northern Indiana on "improving development by design" and watershed assessment, planning, and management during 2006–2007. Presented information on design principles and field application of LID practices, developed and delivered watershed assessment, planning, management workshop, sponsored by regional conservation foundation and local government.

Clean Water Act (CWA) – USEPA National Training Program, 2000–2011 – Served as work assignment leader for CWA training programs that the EPA Office of Water (OW) sponsor. Assisted in program development, conducted presentations on various sections of the CWA, facilitated group exercises, and led discussion groups for workshops at EPA regional offices in Denver, Chicago, Atlanta, Boston, New York, and other state/federal training sites.

RICHARD WALKER, P.E., CFM

Education: Master of Civil Engineering (Water Resources), University of Kentucky, 1989; B.S., Agricultural Engineering, University of Kentucky, 1982

Registrations/Certifications: Professional Engineer, Kentucky, 1988, No. 15345; Professional Engineer, Ohio, 2013, No. 77599; Certified Floodplain Manager, 2011

Professional Affiliations: National Society of Professional Engineers

Office: Lexington, Kentucky

Years of Experience: 31 (Since 1983)

Years with Tetra Tech: 23 (Since 1991)

Mr. Walker has 30 years of experience in civil and water resources engineering, and has specialized in the areas of hydrology, hydraulics, and stormwater management. He is a certified floodplain manager (CFM) by the Assocation of State Floodplain Managers. He manages water resource projects for cities, state governments, and industries. His projects have included program management, floodplain analyses, watershed master plans, stormwater utilities, and MS4 Phase I and Phase II permit compliance. He is currently the MS4 program manager for Lexington, KY.

EXPERIENCE

MS4 Program Manager, Lexington, KY – Mr. Walker is the program manager for the Municipal Separate Storm Sewer System (MS4) permit and the Federal Consent Decree that addresses stormwater violations of the Clean Water Act. Mr. Walker is responsible for ensuring the appropriate procedures and processes are in place for compliance with the MS4 permit and the Consent Decree. He is also responsible for assisting the city with implementing the Stormwater Quality Management Program (SWQMP) that is part of the Consent Decree and MS4 permit. The SWQMP, developed by Tetra Tech, is a comprehensive program for complying with the EPA Phase I Stormwater regulations and addresses public education/involvement, watershed management, illicit discharges, construction site runoff, industrial facilities, high risk commercial

facilities, municipal operations, residential/commercial development, water quality monitoring, and recordkeeping.

Water Quality Management Fee, Lexington, KY – Mr. Walker was part of a team that conducted a rate study for the city, created the impervious area database, and developed the enabling ordinance. The fee generates approximately $11M annually.

Stormwater Permit, Danville, KY – Mr. Walker assisted the city with developing and implementing the MS4 permit in 2003. He wrote the city's stormwater manual that includes design criteria for stormwater management facilities. He also directed the development of new ordinances regarding illicit discharges, erosion control, and post-construction runoff control.

Stormwater Manual, Lexington, KY – Mr. Walker was the primary author of the Stormwater Manual. The manual contains requirements for stormwater management, floodplain management, stream buffers, flood control, and water quality. Options for controlling stormwater runoff from new development include bioretention systems, swales, infiltration basins, and detention ponds. The manual is comprehensive and provides clear design criteria for engineers and developers.

Stormwater Utility and Master Drainage Plan, Hopkinsville, KY – Mr. Walker prepared a stormwater master drainage plan for the city that identified projects to address river flooding and surface drainage problems with a total construction cost of approximately $22M. In addition, he helped the city implement a stormwater utility to generate approximately $1M in annual revenues. He also managed a feasibility study for a large flood control structure on the South Fork of the Little River.

Kentucky BMP Planning and Specifications Manual – Mr. Walker was co-author of the manual entitled *KY Best Management Practices (BMPs) for Controlling Erosion, Sediment, and Pollutant Runoff from Construction Sites*. The Manual includes sections on regulatory considerations; guidance for developing a BMP Plan; and technical specifications for site preparation, soil stabilization, slope protection, drainage system controls, sediment basins, stream and wetland protection, and good housekeeping.

Detention Basin Survey and Evaluation, Lexington, KY – Mr. Walker evaluated approximately 50 detention ponds and permanent pool retention ponds in Fayette County. The project involved reviewing the plat of each basin, conducting a field investigation, identifying maintenance problems, and preparing a cost estimate to repair them. He then helped the government develop a comprehensive maintenance program for basins that involved a cooperative arrangement between the government and the owner of the basin.

Expansion Area 2 Stormwater Master Plan, Lexington, KY – Mr. Walker was the project manager for developing a stormwater master plan for 3,000 acres of land slated for new development, called the Expansion Area, in Fayette County, KY. He worked with a multidisciplined team of engineers, biologists, and planners to design a unique stormwater system of regional facilities and greenways. The project involved chemical and biological monitoring of the streams to establish baseline water quality conditions. A system of detention ponds, wetlands, riparian buffers, and greenways were proposed to control flooding and protect the water resources. The estimated cost of design and construction was $10 million. Mr. Walker continues to serve as the government's consultant on matters related to stormwater management in the Expansion Area, which involves meetings with developers and their engineers to resolve drainage issues related to subdivision and commercial development.

Expansion Area 2 Impact Fee Methodology, Lexington, KY – Mr. Walker developed a financial methodology for assessing developers for their fair share of the stormwater management cost in three different watersheds in the Expansion Area. This involved determining the percent imperviousness of each land use and the cost of system improvements for each watershed.

North Elkhorn SWMM Model, Lexington, KY – Mr. Walker was the project manager for developing a hydrologic and hydraulic SWMM model for the North Elkhorn watershed in Fayette County, Kentucky. The work included installing rain gauges and stream gauges, field investigation of control structures, determining inputs to the model such as

percent impervious and soil infiltration parameters, and calibrating the model.

OCEDA Low Impact Development (LID) Project, Oldham County, KY – Mr. Walker was the senior engineer for the planning and design of the roadway drainage system for a large multi-use development project in Oldham County, KY. The drainage system incorporated curb cuts and open channels instead of a conventional curb and gutter drainage system.

Engineering Manuals for New Development, Lexington, KY – Mr. Walker was the project manager for the development of the engineering manuals for the Lexington-Fayette Urban County Government in 2001. The work included obtaining input from elected officials, government agencies (planning, law, and engineering), developers, citizen groups, and the engineering community. Mr. Walker coordinated the work of four consultants who wrote the Roadway, Geotechnical, Structures, Sanitary Sewer, and Construction Inspection manuals. Mr. Walker was the primary author of the Procedures Manual, which describes the role of the Developer, Engineer, and the government in the development process, beginning with the submission of construction plans and extending through home building. He was the primary author of the Stormwater Manual that established standards for flood control, water quality, and floodplain protection.

Stormwater Fee-In-Lieu Program, Lexington, KY – Mr. Walker developed a stormwater fee-in-lieu program that allows the local government to collect a fee from a developer instead of requiring the developer to construct on-site stormwater facilities. The money generated by this program is used to address flooding and water quality problems.

KPDES Monitoring Services, Lexington, KY – This project has involved chemical, biological, and physical sampling of streams in Fayette County since 1992. Surface water samples are collected and tested for the presence of pollutants listed on the stormwater permit issued by the State of Kentucky. In addition, a report is prepared each year that documents the activities of the government in fulfilling the requirements of the stormwater permit.

Sanitary Sewer Overflow Response Plan (SORP), Lexington, KY – Mr. Walker was on a team that developed the Sewer Overflow Response Plan. Mr. Walker was responsible for the public reporting and regulatory notification sections of the plan.

Special Training

- Natural Channel Design Principles and Applications (International Erosion Control Association)
- Stormwater Ponds: Type and Design (KSPE)
- Stormwater Quality Management (University of Alabama at Birmingham)
- Application of Modern Regional Rainfall Frequency Distributions (Haestad Methods, Inc.)
- National Flood Insurance Program Training (KYTC/KCEC Partnering Workshop)
- Comprehensive Storm and Waste Water Management Modeling Workshop (CAiCE Software)
- XP-SWMM200 Modeling Workshop (XP Software, Inc.)
- Thinking Beyond the Pavement, Context-Sensitive Design (University of Kentucky)
- Advanced Water Surface Profile Computations using HEC-RAS 3.1.3 (Kentucky Engineering Center)
- Erosion Control Plan Development Process (KYTC)
- Fundamentals of Erosion and Sediment Control (Kentucky Division of Water).

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