City of Crossville's Stormwater Management Plan (SWMP)

City of Crossville's Stormwater Program

TNS-079987

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REVISED 2017

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City of Crossville's Stormwater Management Plan (SWMP)

Introduction

This Stormwater Management Plan (SWMP) is required under U.S. Environmental Protection Agency (U.S. EPA) Phase II stormwater regulations, promulgated under the Federal Clean Water Act (CWA). These regulations require the City of Crossville to obtain coverage under a National Pollutant Discharge Elimination System (NPDES) permit. The permit covers stormwater discharges associated with the municipality's separate storm sewer system (MS4) and requires the City to report annually on its progress. The latest stormwater permit issued by TDEC is valid from February 8, 2017 through September 30, 2021.

U.S. EPA's Stormwater Phase II Final Rule establishes that an MS4 stormwater management program is intended to improve the quality of the nation's waterways. Common stormwater pollutants include oil and grease from roadways and parking lots, pesticides, herbicides and fertilizers from lawns, sediment from construction sites and trash. Pollutants are deposited into waterways, impacting beneficial uses of the resources and interfering with the habitat for fish, aquatic organisms and wildlife.

After years of water sampling testing analysis, the State of Tennessee has determined multiple streams within Crossville's jurisdiction that is impaired with either e.Coli, siltation and/or as a result of habitat alterations. Based on these test results, Crossville was charged with implementing a stormwater, or water quality program. In 2009, Crossville implemented its stormwater program. The City of Crossville encompasses approximately 22 square miles and a population of approximately 11,500 citizens.

The purpose of the SWMP is to identify pollutant sources potentially affecting the quality and quantity of stormwater discharges, to provide Best Management Practices (BMPs) for municipal and development activities, and to provide measureable goals to assess the effectiveness of implemented BMPs.

Potential Sources of Pollution

Activity/Source	Pollutant(s) of Concern
Animal/pet waste	e. Coli
Construction Activities	Sediment, concrete, paint, chemicals, debris
Erosion	Sediment, organic matter
Food Service Operations	Wash water, oil, grease, food residue

Grounds Maintenance/Irrigation Operation	Herbicides, pesticides, fertilizers, animal waste
Impervious Areas	Increased flows and pollutant loading, oil, grease, litter, heavy metals
Outdoor Storage of Uncovered and Improperly Stored Materials	Litter, debris, sand, asphalt, soil, pesticides, herbicides, fertilizer, paint, solvents, fuel
Sewer Line Blockages	Raw sewage, e. Coli
Vehicle, Equipment and Materials Washing	Cleaning products, oil, grease, vehicle chemicals and fluids

Minimum Control Measures

Minimum Control Measures are aimed at achieving improved water quality. The City implements BMPs for the following six minimum control measures to remain in compliance with stormwater program requirements:

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff
5. Post-Construction Stormwater Management with New and Re-Development
6. Pollution Prevention/Good Housekeeping for Municipal Operations

1. Public Education and Outreach

Person Responsible: Stormwater Coordinator

The City of Crossville's public information and education plan is comprised of various components (printed materials distributed at information tables and events; Park/City events and the City's website; with the goal of educating the citizens on the effects of actions taken on stormwater pollution and water quality.

The City of Crossville targets all age groups at stream clean-ups, at public meetings and sustainability fairs on a yearly basis and, as needed, at workshops. Topics covered include stormwater, water quality, environmental education, ordinances, pollution prevention, etc. The general public is notified through local newspapers, email lists, flyer/announcement distribution to public information tables, website postings and promotion of future tasks at current events.

Table 1-1

BMP Implementation: Pubic Education and Outreach

Year and Timeline	BMP	Measurable Goal(s)	Person(s)/ Department(s) Responsible
1 through 5, continuously	Provide a functional and educational stormwater website	Learn and develop a functional and educational stormwater website with information helping the public	Stormwater Department
1 through 5, as scheduled	Produce more brochures for specific groups such as schools, businesses and contractors.	Find brochures for targeted audiences and distribute them to specific groups	Stormwater Department
1 through 5, as needed	Provide training to employees and the general public on stormwater	Setup and maintain an employee training schedule.	Stormwater Department
1 through 5, continuously	Use media for a broader audience	Use social media and other outlets such as radio, publishing and the Internet to inform the public on Stormwater issues and news	Stormwater Department

2. Public Involvement and Participation

Person Responsible: Stormwater Coordinator

One of the main goals of the City's stormwater program is to not only educate the public, but to also get them involved in helping improve local water quality. This can be completed by attending workshops and taking the information and applying it at home or simply participating in stream clean-ups.

Participation by citizens ensures the program reflects community values and priorities and thus has the highest potential for success.

Table 2-1

BMP Implementation: Pubic Involvement and Participation

Year and Timeline	BMP	Measurable Goal(s)	Person(s)/ Department(s) Responsible
1 through 5, as needed	Storm Drain Labeling	Label storm drains with metal disks using appropriate adhesive. These disks indicate runoff entering drain	Stormwater Department, citizen and volunteer groups

		goes directly to the stream (and is not treated).	
1 through 5, as scheduled	Workshop Offerings	Coordinate workshops geared towards homeowners for education and participation	Stormwater Department
1 through 5, as scheduled	Outreach Events	Stream clean-ups	Obed River Watershed, Community, Veolia, Stormwater
1 through 5, monthly and as needed	Stormwater Meetings	Attend meetings to further help the public.	Stormwater Department

3. Illicit Discharge Detection and Elimination

Persons Responsible: Stormwater Coordinator

The goal of this minimum control measure is to reduce pollutants in stormwater runoff to receiving waters. It requires the development and implementation of a system to identify and eliminate sources of illicit discharge and illegal dumping.

The permit requires the City of Crossville to develop, implement, and enforce a program that detects and eliminates illicit discharges.

The City must develop a storm sewer system map showing the location of all outfalls as well as the names and locations of all waters receiving discharges from the indicated outfalls and develop a program addressing non-stormwater discharges, including illegal dumping, hot spot/priority areas, and illegal discharges into the local water bodies.

Table 3-1

BMP Implementation: Illicit Discharge Detection and Elimination

Year and Timeline	BMP	Measurable Goal(s)	Person(s)/ Department(s) Responsible
1 through 5, as needed	Outfall Inventory	Continue to work on and add data to outfall Map	Stormwater Department
1 through 5, continuously	Dry weather Screening	Do dry weather screening to prevent discharge before rain events	Stormwater Department
1 through 5, Permit Cycle	Employee Training	Train employees from different departments on what to look for and do, during an illicit discharge	Stormwater Department

1 through 5, as needed	Storm Drain Labeling	GPS storm drains to route flows	Engineering Department

4. Construction Site Runoff Control

Person Responsible: Inspector

The goal of this is to prevent sediment and waste generated at active construction sites from entering the stormwater conveyance system. The stormwater ordinance requires erosion and sediment control BMPs be in place prior to, during, and following development or re-development. Construction site operators are required to properly manage waste on the site such as discarded building materials, concrete truck washouts, chemicals, litter, sanitary waste, etc. as these items can adversely affect water quality if they come in contact with it.

Construction site operators are required to develop, implement, and maintain a Stormwater Pollution Prevention Plan (SWPPP) which is to be kept on site and accessible. Construction sites are also to have in place an inspector which self-inspects the site and maintains accurate reports. The City also has an inspector which oversees stormwater controls on the site and helps the developer to remain in compliance with Local, State and Federal stormwater regulations.

The city inspects all sites twice weekly and after every rain event.

Table 4-1

BMP Implementation: Construction Site Runoff Control

Year and Timeline	BMP	Measurable Goal(s)	Person(s)/ Department(s) Responsible
1 through 4, as needed	Ordinance	Review ordinance as required to comply with NPDES	Stormwater Coordinator
1 through 5, updated as needed	Review Land Disturbance Application to provide a detailed and rapid review process	Creation and maintenance of current permitted construction sites within City	Stormwater Coordinator
1 through 5 continuously	Provide the Public with knowledgeable material to reduce stormwater runoff	Provide Erosion Prevention and Sediment Control manuals for Public Usage	Stormwater Coordinator
1 through 5, continuously	Inspections and Enforcement	Review effectiveness of inspection protocols and enforcement procedures	Stormwater Coordinator

5. Post Construction Stormwater Management for New and Re-Development

Persons Responsible: Inspector, Stormwater Coordinator

The goal is to reduce the generation of non-point source pollution from urban runoff through planning and design prior to development or re-development. Post-construction runoff control focuses on site and design considerations, which are most effective when addressed in the planning and design stages of project development. Effective long-term management and maintenance are critical, so the best design opportunities are those needing the least amount of maintenance. The goal of the program is to integrate basic and practical stormwater management techniques into new development to protect water quality.

Post-construction stormwater management controls include permanent structural and non-structural BMPs (e.g., conservation of natural and permeable areas, permeable pavers, rooftop runoff infiltration, mechanical storm drain filters, rain gardens, green infrastructure, etc.) that remain in place following project completion.

Table 5-1

BMP Implementation: Post-Construction Stormwater Management for New and Re-Development

Year and Timeline	BMP	Measurable Goal(s)	Person(s)/ Department(s) Responsible
1 through 5, as needed	Keep ordinances and policies up to standards of the new MS4 permit	Meet with Stormwater advisory committee and update ordinances and policies	Stormwater Coordinator
1 through 5, as needed	Modernize checklist to insure a thorough review process	Review Plans checklist to ensure all specifications are met, process other MS4 checklist to see if ours needs addressed	Stormwater Coordinator
1 through 5, as needed and annually	Training	Stay updated on training such as Level 2 Stormwater Design	Stormwater Coordinator
1 through 5, continuously	Learn TNRAT	Use TNRAT more and have Engineering firms submit calculations using TNRAT	Stormwater Coordinator

6. Pollution Prevention/Good Housekeeping for Municipalities

Person responsible: Stormwater Coordinator

The goal is to assure that facility and maintenance operations City-wide occur in a manner which is protective of stormwater quality. Several employees move throughout the City on a daily basis and are the eyes and ears "on the ground" to observe water quality related issues. Employees are also responsible for the safety of their work place and know their actions can directly affect the quality of our waterways. Employees are trained on a regular basis on water quality related issues.

Table 6-1

BMP Implementation: Pollution Prevention/Good Housekeeping for Municipalities

Year and Timeline	BMP	Measurable Goal(s)	Person(s)/ Department(s) Responsible
1 through 5, as needed	Revisit city owned properties to ensure pollution prevention and good housekeeping are being used	Continue City-wide departmental good housekeeping training to help improve pollutant control efforts and water quality	All departments.
1 through 5, annually and as needed	City employee training	Train city employees in different departments on pollution prevention and good housekeeping	Stormwater Coordinator
1 through 5, monthly	Keep city infrastructure pollution free	Evaluate roadway maintenance procedures, in order to minimize discharges of pollutants during maintenance operations	All departments.
1 through 5, monthly, quarterly and as needed	Keep ordinances updated so the City of Crossville sets an example of good housekeeping in pollution prevention and sediment control	Update and review pollution prevention policies and ordinances, make sure city employees understand good housekeeping	All departments

Inspection and Monitoring Programs

Construction Inspection

Persons Responsible: Inspector

The goal of this is to prevent sediment and waste generated at active construction sites from entering the stormwater conveyance system. The stormwater ordinance requires erosion and sediment control BMPs be in place prior to, during, and following development or re-development. Construction site operators are required to properly manage waste on the site such as discarded building materials, concrete truck washouts,

chemicals, litter, sanitary waste, etc. as these items can adversely affect water quality if they come in contact with it.

The city has a technical review process that evaluates new development and redevelopment for construction site runoff. A pre-construction meeting between the city and the site developer occur to discuss details of water quality controls before, during and after construction.

The site plan review process:

1. Receipt by Stormwater Department of document from specified project engineering company for review and consideration.
2. A copy of the document/attachment is forwarded to City Engineer, Codes Department and Planning Admin.
3. Upon receipt a staff review meeting is scheduled to discuss outstanding issues of the document relating to all departments.
4. Corrected comments are prepared by the Stormwater Coordinator and sent to the specified project engineer.
5. Upon receipt of corrected document, the Stormwater Coordinator will conduct a final review to determine if all outstanding issues have been addressed in accordance with the City of Crossville Stormwater Ordinance and policies.
6. Copies of the document and any attachments will be delivered to city staff for review prior to the pre-construction meeting.

Prior to commencement, the City's Inspector verifies appropriate stormwater controls are properly installed and functioning. Construction site operators are required to develop, implement, and maintain a Stormwater Pollution Prevention Plan (SWPPP) which is to be kept on site, be updated as needed, and remain accessible to the City's Inspector. Construction sites are also to have in place an inspector which self-inspects the site and maintains accurate reports. The city inspects all construction sites twice a week and after every rain event. The City's Inspector oversees stormwater controls on site and works to keep the developer in compliance with Local, State and Federal stormwater regulations.

A pre-construction meeting is required for the following:

1. Any site that discharges into waters with Unavailable Parameters.
2. Any Land Disturbance with one (1) or more acres disturbed.
3. Any site with disturbance less than one (1) acre but part of a larger common development.

TDEC Inspection Form

NNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC)

Division of Water Pollution Control (WPC)

6th Floor Annex, L&C Tower, 401 Church Street, Nashville, Tennessee 37243

1-888-891-8332 (TDEC)

General NPDES Permit for Stormwater Discharges from Construction Activities (CGP)

Construction Stormwater Inspection Certification (Twice-Weekly Inspections)

Site or Project Name:			**NPDES Tracking Number: TNR**	
Primary Permittee Name:			Date of Inspection:	
Current approximate disturbed acreage:		Has rainfall been checked/documented daily? ☐Yes ☐ No	Name of Inspector:	
Current weather conditions:			Inspector's TNEPSC Certification Number:	

Please check the box if the following items are on-site:

☐ Notice of Coverage (NOC) ☐ Stormwater Pollution Prevention Plan (SWPPP) ☐ Twice-weekly inspection documentation

☐ Site contact information ☐ Rain Gage ☐ Off-site Reference Rain Gage Location: _____

Best Management Practices (BMPs):

Are the Erosion Prevention and Sediment Controls (EPSCs) functioning correctly: If "No", describe below in Comment Section		
1. Are all applicable EPSCs installed and maintained per the SWPPP?	☐Yes	☐No
2. Are EPSCs functioning correctly at all disturbed areas/material storage areas per section 4.1.5?	☐Yes	☐No
3. Are EPSCs functioning correctly at outfall/discharge points such that there is no objectionable color contrast in the receiving stream, and no other water quality impacts per section 5.3.2?	☐Yes	☐No
4. Are EPSCs functioning correctly at ingress/egress points such that there is no evidence of track out?	☐Yes	☐No
5. If applicable, have discharges from dewatering activities been managed by appropriate controls per section 4.1.4? If "No", describe below the measures to be implemented to address deficiencies.	☐Yes	☐No

6.	If construction activity at any location on-site has temporarily/permanently ceased, was the area stabilized within 14 days per section 3.5.3.2? If "No", describe below each location and measures taken to stabilize the area(s).		☐Yes	☐No
7.	Have pollution prevention measures been installed, implemented, and maintained to minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters per section 4.1.5? If "No", describe below the measures to be implemented to address deficiencies.		☐Yes	☐No
8.	If a concrete washout facility is located on site, is it clearly identified on the project and maintained? If "No", describe below the measures to be implemented to address deficiencies.	☐ N/A	☐Yes	☐No
9.	Have all previous deficiencies been addressed? If not, describe the remaining deficiencies in the Comments section. ☐ Check if deficiencies/corrective measures have been reported on a previous form.		☐Yes	☐No

Comment Section. If the answer is "No" for any of the above, please describe the problem and corrective actions to be taken. Otherwise, describe any pertinent observations:

Certification and Signature (must be signed by the certified inspector and the permittee per Sections 3.5.8.2 (g) and 7.7.2 of the CGP)

I certify under penalty of law that this report and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Inspector Name and Title:	Signature:	Date:
Permittee Name and Title:	Signature:	Date:

Notice of Violation Letter Example

City of Crossville

392 North Main Street

Crossville, Tennessee 38555~4275

Tel (931) 484-5113

Fax (931) 484-7713

STORMWATER COORDINATOR

Month Day, Year

NAME

ADRESS

Crossville, TN 38555

RE: **Notice of Violation (NOV) for Construction Activities Located at (Address)**

Dear Name:

This correspondence is to document a notice of violation of the City of Crossville Municipal Code 14-803 (A) (1).

On May xx, 2017, I observed the following conditions:

1) At 1234 Smith Rd. a wooded lot was cleared without receiving a land disturbance permit from the City of Crossville. A 303d stream (Obed River) lies within the property boundary which carries a 60ft buffer from the stream bank. The stream buffer as of May xx, 2017 had not been disturbed and silt fence had been installed.

At the current time, this correspondence is a written notice and no penalty has been assessed for this violation. HOWEVER, be advised that continued non-compliance may result in additional fines, no less than $50 and no more than $5,000 per day per violation.

You are in violation of Municipal Code 14-803:

> "Every person disturbing less than one acre of land and not part of a larger development must address land disturbance permit as a part of their building permit. Any land disturbance less than 4,000 square feet is exempt. The individual will be required to follow the policy on disturbances less than one acre and not part of a larger common plan of development".

Should you have any questions please feel free to give me a call at 931-456-6947.

Sincerely,

Name

Stormwater Coordinator

Municipal Inspection

Persons responsible: Stormwater Coordinator

The goal is to assure that facility and maintenance operations City-wide occur in a manner which is protective of stormwater quality. Several employees move throughout the City on a daily basis and are the eyes and ears "on the ground" to observe water quality related issues. Employees are also responsible for the safety of their work place and know their actions can directly affect the quality of our waterways. Employees take pride in their jobs and are trained on a regular basis on water quality related issues.

Public Works has multiple employees trained in level 1 Erosion and Sediment Control. Those employees are extremely knowledgeable and observing keeping city streets and properties clean for stormwater quality.

Illicit Discharge Detection and Elimination Inspection

Persons Responsible: Inspector

The goal of this minimum control measure is to reduce pollutants in stormwater runoff to receiving waters. It requires the development and implementation of a system to identify and eliminate sources of illicit discharge and illegal dumping.

The permit requires the City of Crossville to develop, implement, and enforce a program that detects and eliminates illicit discharges. The city must develop a storm sewer system map showing the location of all outfalls as well as the names and locations of all waters receiving discharges from the indicated outfalls and develop a program addressing non-stormwater discharges, including illegal dumping, hot spot/priority areas, and illegal discharges into the local water bodies.

The City utilizes its GIS system to document outfalls channeling runoff to the creeks and to assess stream conditions at monitoring sites. Outfalls are mapped utilizing GIS mapping by way of GPS and visual assessment. After outfalls are located, The City of Crossville will utilize dry weather screening to visually inspect outfalls, ditches and streams for Illicit Discharge.

Illegal dumping is addressed by the City's Codes Department and is prosecuted when possible.

TMDL

TMDL Overview

The TMDL process establishes the maximum allowable loadings of pollutants for a water body while maintaining quality standards for various uses ranging from aquatic and marine life to recreational usage. The TMDL is used to develop controls for reducing pollution from point and non-point sources in order to restore and maintain water resource quality. Water quality monitoring activities provide the chemical, physical and biological data needed to determine the present quality of the State's waters and identifies the sources of pollutants in those waters.[i]

The EPA, with oversight from the local TDEC office in Cookeville, requires local MS4 Phase II communities, which the City of Crossville is classified as, to implement a five-year monitoring plan of its impaired stream segments which are listed within the June 6th, 2008 TDEC Emory River, TMDL report.

The water monitoring program shall include collection and analysis of physical, chemical and biological data as well as quality assurance and control programs to assure scientifically valid data.[ii] Additional monitoring and assessment activities are recommended to determine whether implementation of TMDLs in tributaries and upstream reaches which will result in achievement of in-stream water quality targets for E. coli. Long-term monitoring is ideal for determining the sources of pollution.

The purpose of this plan is to comply with TDEC's monitoring requirements associated with the approved TMDL report. The City's stormwater permit outlines the six minimum required BMPs previously described within this SWMP. To evaluate the program's effectiveness and TMDL reporting compliance, appropriate monitoring programs must be established and fulfilled.

The City of Crossville must prepare and implement stream monitoring plans for both siltation/habitat alterations and for pathogens. The city is responsible for conducting one geometric mean test for E. coli, a visual assessment, and obtain a flow measurement for each impaired stream segment within its jurisdiction.

Since the issuance of the new NPDES permit (effective February 8, 2017 – September 30, 2021), the City is also required to monitor each stream segment that is impaired with siltation. Biological stream sampling will be performed utilizing methods identified within TDEC's standard operating procedures for macro-invertebrate sampling and/or testing approved under 40 CFR §136. Monitoring information shall include the monitoring date, exact location (latitude and longitude), time of sampling, and names of individuals conducting sampling, date the analyses were performed, names of individuals who conducted the analyses, analytical techniques or methods used and the results of the analyses.

From this inspection process, the City will be able to determine if changes will need to be made to existing BMPs and/or if new BMPs need to be established. Once the data's in place, it'll be determined if priorities need to be re-established. Monitoring data will be included in future annual stormwater reports submitted to TDEC as required.

TMDL NPDES MS4 Permit Requirements

The approved TMDL considers E. coli a nonpoint source of pollution which is not regulated by an NPDES permit. However, the Phase II permit includes conditions for stormwater discharges to impaired streams and conditions for impaired water bodies under a TMDL.

Nonpoint sources of both coliform bacteria and siltation are not identified as entering a water body through a specific conveyance at a single location. These sources usually involve accumulation on land surfaces and wash off as a result of storm events, are present due to failing septic system or as a result of stream bank erosion or failing BMPs from construction activities. Nonpoint sources of E. coli loading are primarily associated with agricultural and urban land uses. The vast majority of water bodies identified on the EPA's 2010 303(d) listed as impaired for E. coli or siltation are attributed to nonpoint agricultural or urban sources.

Wildlife and agriculture deposit coliform bacteria with their feces onto land surfaces where it can be transported during storm events to nearby streams. Agricultural livestock and other unconfined animals often have direct access to water bodies and can provide a concentrated source of coliform bacteria loading directly to a stream.

Urban land use provides additional opportunities for carrying pollutants to our water bodies such as stormwater runoff, construction activities, sanitary waste, improper disposal of wastes, leaking septic systems, domestic animals, etc.

TMDL Data Review

The TMDL for E. coli within the Emory River Watershed was submitted to EPA, Region 4 on June 6, 2008, and approved on August 3, 2008. The TMDL addresses water body segments of the Emory River Watershed which are listed on EPA's 2018 303(d) list as impaired due to E. coli, siltation, and habitat alterations. The streams impaired for E. coli from the 2006 final list remain the same on the EPA's 2018 303(d) list. The following stream segments are within the City of Crossville's jurisdiction:

Stream Name	Stream ID	Cause	TMDL Priority	Water Size
Obed River	TN06010208013_1000	Nitrate, Phosphorus	L	14.5
One Mile Creek	TN06010208015_0930	**E.Coli**, Siltation	L,NA	8.5
Black Drowning Creek	TN06010208013_0400	Siltation	NA	13.1
Little Obed River	TN06010208013_0200	Siltation,Nitrate, Phosphorus, **E.coli**	L	7.96
Byrd Creek	TN06010208015_0900	Oxygen, Dissolved	L	32.01
Obed River	TN06010208013_2000	Physical Substrate habitat alteration	L	1.48

E. coli is an indicator of the presence of disease-causing organisms such as bacteria or viruses, which can pose an immediate and serious health threat to humans. The noted primary source of E. coli is untreated or inadequately treated human or animal fecal matter. Based on the analysis of data taken in the above-mentioned streams, the TMDL develops load reductions in E. coli necessary for the impaired streams segments to meet water quality standards. The City of Crossville continues to undergo sewer rehabilitation throughout its jurisdiction to ensure the sewer system is operating at capacity.

TMDL Data Results for E. coli

According to the Standard Operating Procedures for Chemical and Bacteriological Sampling of Surface Water implemented by TDEC, five samples must be collected within a 30-day period. Samples should be collected at least 24 hours apart from one another and rain events should be avoided (State of Tennessee Department of Environment and Conservation, 2011). Samples should be collected between the months of March and November.

TMDL Monitoring Plan for E. coli and Macro-invertebrate sampling

This monitoring plan gathers various data sets regarding the impairment of streams within the City's jurisdiction to identify sources and levels of E. coli, siltation and/or habitat alteration contamination. By interpreting and using this data, we can work to identify potential pollutant sources.

TDEC has developed standards for the TMDL monitoring plan such as visual surveys, chemical monitoring, and biological assessments. For E. coli and siltation detection, TDEC requires visual assessments and surveys as well as chemical or macro-invertebrate sampling and flow measurements within each impaired stream segment. The City of Crossville uses an electronic tablet to document outfalls during their visual stream assessments by entering information into the preset data sheet on the tablet.

Visual Assessment

(1) Identify possible sources of impairment
  (a) Stream walk (minimum of 2 people conducting survey)
    (i) Tablet Data Sheet
      1. Point source identification and details
    (ii) SCORE Worksheet
      1. Land use classification
      2. Site description
      3. Corrective action plan and timeline
    (iii) TDEC Required Forms
(2) Prioritize sources of impairment
  (a) Analyze data collected
  (b) Prioritize impairment sources
(3) Documentation
  (a) Photographs
  (b) Maps

TMDL e. Coli and Siltation Monitoring and Testing Procedures

E. coli

In-stream sampling for pathogens is performed using TDEC's Standard Operating Procedures (http://www.state.tn.us/environment/wpc/publications/ChemSOP03QUAP.pdf) and guidelines laid out in 40 CFR 136.3, table 1A, #5, table 1H, #1, table 2 referring to table 1A http://ecfr.gpoaccess.gov/cgi/t/text/textidx?c=ecfr&tpl=/ecfrbrowse/Title40/40cfr136_main_02.tpl

Results are included in our annual MS4 report, unless otherwise informed by TDEC.

Geometric mean testing, a visual assessment, and flow measurement will be conducted on each impaired stream segment.

Summary

The main goal of the SWMP is to reduce the discharge of pollutants into local water bodies and to identify activities or structural improvements that help improve the quality and reduce the quantity of stormwater runoff. BMPs have been developed and are in place to help reduce the discharge of pollutants to the storm drain system, and are updated as needed to comply with changes to the NPDES permit requirements.

The City of Crossville will survey the same impaired stream segments within the city limit boundary. Data will be collected for E. coli analyses and submitted to TDEC. This data, as it's collected, will be included with the City's annual MS4 report.

Only until data is collected, analyzed, mapped and documented, will the sources of pollutants be targeted more accurately. Continuing to physically walk the streams and identifying outfalls and condition of the stream's corridors will also aid in this process. In addition, the City will continue to apply the terms of its MS4 permit to the fullest extent, ensuring existing BMPs are implemented to meet the waste load allocations for each water body. This allows the city to determine the need for the possibility of new BMPs to be created and implemented.

At the end of the new Phase II permit, the city hopes to have a level of information needed to determine the point and non-point sources of pollutants along these impaired streams so the City of Crossville and TDEC can further enforce regulatory measures to those causing pollution to our water bodies. The ultimate goal is to remove each impaired water body within Crossville's jurisdiction from EPA's 303(d) list of impaired streams.

An annual report is submitted by the City of Crossville to TDEC by September 30, and includes the status of compliance with permit conditions, an assessment of the appropriateness and effectiveness of stated BMPs, status of identified measurable goals, results of information collected and analyzed, includes monitoring data collected during the reporting period, proposed changes to the overall stormwater management plan and why they are needed, and any changes in the person(s) implementing and coordinating the stormwater management plan. A public hearing or an attachment on the cities website will allow an opportunity for the public to review and ask questions prior to September 30 due date of every year.

TMDL References

[i] Electronic Code of Federal Regulations. "Water Quality Monitoring." Protection of the Environment 40 CFR Part 130.0(b) Program Summary and Purpose. Accessed 24 June 2008.

[ii] Electronic Code of Federal Regulations. "Water Quality Monitoring." Protection of the Environment 40 CFR Part 130.4(b) Water Quality Monitoring. 11 April 1989. Accessed 24 June 2008.