

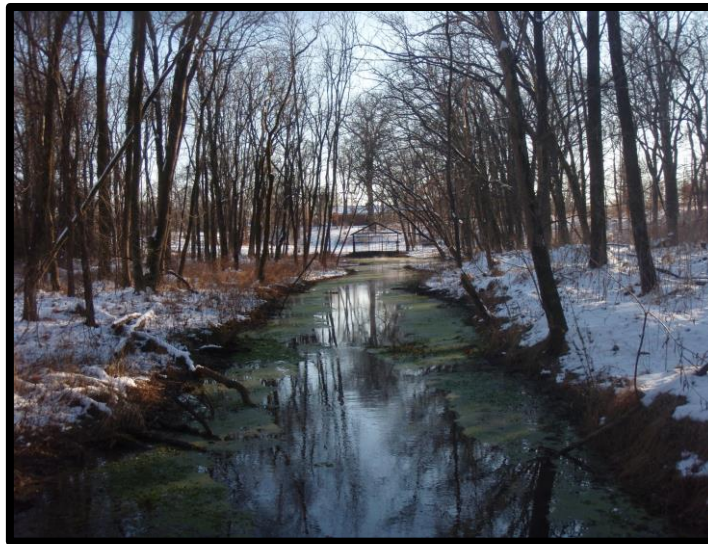
Sinking Creek Pollution Reduction Plan

Last updated: 12/4/2014
Re: MS4 Permit, **Section 3.1 Discharges to Water Quality Impaired Waters**
(Including requirements in 5.1, 5.2)

Waterbody I.D. #: TN05130203018_0100
Subwatershed: West Fork Stones River (water shed – 971 acres)

Purpose of this report is to document actions taken to fulfill requirements for the MS4 (City of Murfreesboro) related to impaired waters. These actions include: BMP implementation, monitoring and sampling schedules, and other actions related to these requirements.

- I. **TMDL's or Impairments**
- II. **Waste Load Allocations (WLA)**
- III. **BMP's**
 - a. **Existing**
 - Structural
 - Non structural
 - Good housekeeping
 - In stream
 - Total imperviousness
 - b. **Recommended**
- IV. **Monitoring**
- V. **Notes**



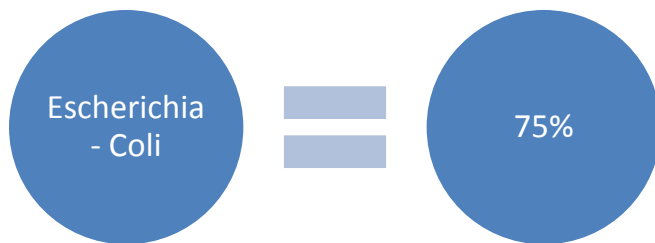
I. TMDL's or Impairments

Sinking Creek is listed on the 303d list for two impairments. The MS4 is listed as the source of the E-coli impairment in which there is also a TMDL. Seasonal sampling results indicate that most of the bacteria loading is in response to rain events and first flush but some loading occurs during base flow conditions.

Cause/ TMDL Priority	Is MS4 a source?	Approved?	MS4 assigned to WLA?
Alteration in stream-side or littoral vegetative cover	No	No	--
Escherichia coli	Yes	Yes	Yes

II. Waste Load Allocation

A Sediment TMDL with a reduction goal of 75% percent has been assigned to the MS4. The MS4 permit, section 3.1 requires that a MS4 discharging into such waters must implement BMP's which help achieve the assigned WLA. Furthermore, the MS4 must initiate sampling and monitoring component to assess the effective of such BMP's.



III. Best Management Practices (BMP's)

A. Existing BMP's

A variety of BMP's exist in Sinking Creek. These BMP's range from sewer rehabilitation work to stormwater line clearing. These BMP's are detailed below.

BMP	Target	Quantity	Date/ Schedule
Structural			
Sewer Rehab	e-coli (if contributor)		
PCR controls	TSS/ e-coli/ volume	Est acres treated	ongoing
Retrofits		(sq feet served)	

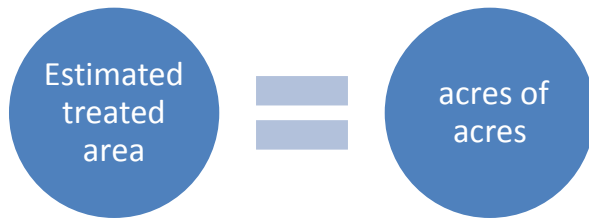
CIP			
Non Structural			
“Tree Day” – riparian tree giveaway and education	Alteration in stream-side or littoral cover	riparian education/ brochures (ft received trees)	2008/ 2015
In-stream			
Stream clean ups			
Jet vacuum line clearing	TSS/e-coli	Cubic yards removed	2008/ongoing

- **Structural**

- **Sewer Rehab**

- Murfreesboro Water and Sewer Department actively televises and rehabs sewer lines. The sanitary sewer system also includes a flow monitoring system.

- **PCR Controls**



Control Type	Quantity	Annual change	Estimated Total Removal (model)
Ponds		--	
Weirs		--	
Filter Strip		--	
Infiltration trench		--	
Porous Pavement	6,310 sq ft	--	
Bioretention	33,085 sq ft	--	
Sewer line rehab			

- **Existing retrofits**

- **Non Structural**

Education/Outreach

The City of Murfreesboro in conjunction with Middle Tennessee State University actively targets the Garrison Creek Watershed with education/ outreach activities. These activities range from city TV programming to volunteer events. In 2008 and 2015 residents living along Sinking Creek received riparian education and the opportunity to receive tree seedlings.

Sediment line clearing

A jet vacuum truck clears all lines directly connected to Garrison Creek with the exception of lines located on private property. Quantities of sediment removed are tracked in an operations and maintenance work order management system. Lines are coded in the GIS to correspond with sub watersheds.

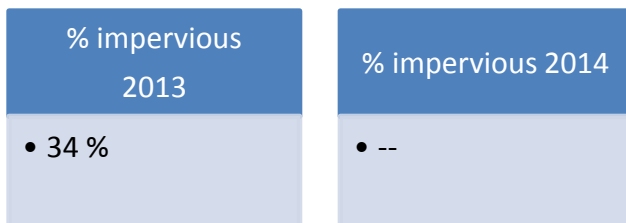
Riparian education 3/21/2014	Properties educated 164		

- **In Stream**

Sinking Creek has several large debris dams that .

Total Imperviousness

The Garrison Creek property is currently being built out with some church properties containing large green spaces.



B. Recommended BMP's

In order to meet waste load allocation numbers for e-coli and restore habitat in Sinking Creek, a variety of BMP's recommended

BMP	location	Pollutant	Schedule
Parking lot retrofit		e-coli/ volume	--
Bank Restoration	Northfield Blvd and Sulphur Springs Rd	TSS (erosion)	2015 or 2016
Bank Restoration		sediment	--
Riparian education (2 nd round)	Sinking Creek watershed	Habitat	Spring 2015
Channel structure	Main channel	Habitat	--
Continue sewer rehab			

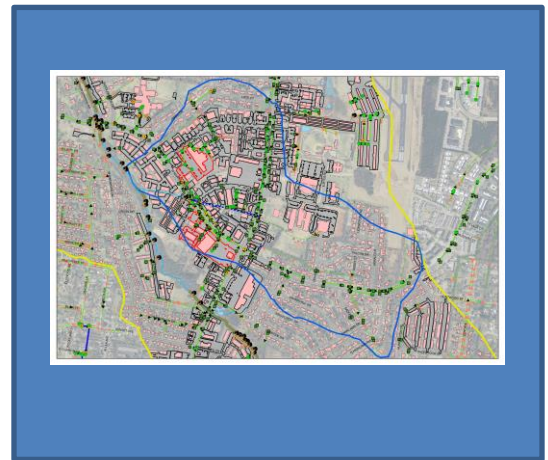
Parking Lot retrofits

Several large parking lots exist in a sub basin near Heritage Park Dr. The basin is drained by a large concrete channel that becomes jurisdictional just before it dumps into Sinking Creek. Bacteria sampling indicates that high levels of e-coli are being loaded into the channel during the first flush of storm events. Staff recommends partially unused parking lots be retrofitted with BMP's to minimize first flush run off.

Recently, Lee Gentry of LDA, Inc. modeled this basin with prospective LID controls

Bank Restoration

Segments of Sinking Creek between Memorial Blvd and Northfield Blvd suffer from moderate bank erosion as noted in the 2014 visual stream assessment. The two separate segments total 418 ft.



IV. Sampling and Monitoring

Permit language requires sampling and monitoring activities in order to gage the effectiveness of installed BMP's. Specific sampling is also required when certain pollutants are contributing to stream impairment. Furthermore, staff samples city wide to establish general water quality conditions. The SWMM model will also be ran to generate sediment removal numbers. *Sampling results are compiled in a GIS database which can be viewed online:*

<http://mwsdmaps.murfreesborotn.gov/gisapps/Stormwater/>

Parameter	Schedule/ frequency	Quality Trend up/down	Rule or BMP Effectiveness
Outfall	Summer 2014/ annually		3.1, BMP effectiveness
Biological SQSH (attached)	2014, Spring 2015/ bi-annually	2014 = 14/ 2015 =	5.1
Biological Cursory	Spring 2015/ annually		3.1, BMP effectiveness
Nutrients	Spring/ Fall 2015/annually		3.1, BMP effectiveness
Visual Stream Assessment	Summer 2014/2019 5 yrs		5.2

Model Runs

Model Type	TSS removal estimates	watershed

VI. Notes

- *A sewer easement exists alongside Sinking Creek in many areas limiting large canopy trees due to easement maintenance.*
- *As mentioned above, sampling results*

