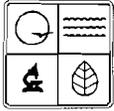


At 10x25



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
PO BOX 176, JEFFERSON CITY, MO 65102
FORM K - APPLICATION FOR INDIVIDUAL SMALL MS4 GENERAL PERMIT (FORM M MUST ALSO BE SUBMITTED)

FOR AGENCY USE ONLY	
CHECK NUMBER	
DATE RECEIVED	FEE SUBMITTED
5-16-13	0883

THIS IS FOR A STORMWATER ONLY DISCHARGE PERMIT.

1.00
 a. This municipality/area is now operating a separate storm sewer system under Missouri Operating Permit Number (NPDES) MO - _____ or MO-R040001
 b. This is a new permit;

2.00 NAME OF MUNICIPALITY/AREA MS4

Sedalia MS4

2.10 ADDRESS (HEADQUARTERS PHYSICAL LOCATION) STREET CITY STATE ZIP CODE
 200 S. Osage Avenue, Sedalia, MO 65301

3.00 OWNER

NAME City of Sedalia	TELEPHONE NUMBER 660-827-3000
ADDRESS 200 S. Osage Avenue, Sedalia, MO 65301	CITY STATE ZIP CODE

4.00 CONTINUING AUTHORITY

NAME City of Sedalia	TELEPHONE NUMBER 660-827-3000
ADDRESS 200 S. Osage Avenue, Sedalia, MO 65301	CITY STATE ZIP CODE

5.00 MUNICIPALITY/ AREA CONTACT

NAME Bill Beck, Jr	PHONE 660-827-3000
	FAX 660-827-7831
TITLE Public Works Director	

6.00 FOR EACH KNOWN STORMWATER OUTLET GIVE LEGAL DESCRIPTION (ATTACH ADDITIONAL SHEETS AS NECESSARY)

Stormwater Outlet Number _____ ¼ _____ ¼ _____ Sec. _____ T _____ R _____ County _____
 Lat _____ Long _____ See Attached

6.10 FOR EACH KNOWN STORMWATER OUTLET LIST THE NAME OF THE RECEIVING WATER

Outlet Number _____ Receiving Water _____
 Outlet Number _____ Receiving Water _____
 Outlet Number _____ Receiving Water _____ See Attached

7.00 ATTACH A USGS 1" - 2000' SCALE MAP SHOWING THE LOCATION OF THE MUNICIPALITY/AREA IN RELATION TO THE LOCAL ROAD SYSTEM. INDICATE ON THE MAP THE MUNICIPALITY/AREA BOUNDARIES, THE RECEIVING STREAM(S); ALL KNOWN STORMWATER OUTLETS, AND THE MAP SECTION, TOWNSHIP, AND RANGE.

8.00 I CERTIFY THAT I AM FAMILIAR WITH THE INFORMATION CONTAINED IN THE APPLICATION, THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF SUCH INFORMATION IS TRUE, COMPLETE AND ACCURATE, AND IF GRANTED THIS PERMIT, I AGREE TO ABIDE BY MISSOURI CLEAN WATER LAW AND ALL RULES, REGULATIONS, ORDERS AND DECISIONS, SUBJECT TO ANY LEGITIMATE APPEAL AVAILABLE TO AN APPLICANT UNDER THE MISSOURI CLEAN WATER LAW OF THE MISSOURI CLEAN WATER COMMISSION.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)
 Bill Beck, Jr. Public Works Director

PHONE
 660-827-3000

SIGNATURE

JUL 01 2013

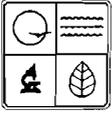
DATE SIGNED
 5-13-13

KANSAS CITY REGIONAL OFFICE

Stormwater Permit Information

Form K – 6.00, 6.10

Outfall #	Location/Comment	Outfall location (UTM)		First Classified Stream	Location				
		Easting	Northing		Q	Q	S	T	R
001	28 th & New York	481917	4281907	Flat Creek	SW1/4	SW1/4	11	45N	21W
002	Washington & 28 th	480436	4282004	Flat Creek	SW1/4	SW1/4	10	45N	21W
003	32 nd & Kentucky	479726	4281628	Flat Creek	SE1/4	SE1/4	9	45N	21W
004	W 32 nd & Erika	478373	4281711	Flat Creek	SE1/4	SE1/4	8	45N	21W
011	35 th St. Terrace	479092	4281262	Flat Creek	SE1/4	NW1/4	16	45N	21W
010	W 32 nd	476608	4281806	Flat Creek – Trib.	SE1/4	SE1/4	7	45N	21W
005	Airport	485064	4284206	Shaver Creek	SE1/4	NE1/4	1	45N	21W
006	Boonville	483084	4284804	Cedar Creek	SE1/4	SE1/4	35	46N	21W
007	Sedalia Rd.	479060	4286206	Sewer Branch	NW1/4	NW1/4	33	46N	21W
008	Central WWTP	477143	4285080	Brushy Creek	SW1/4	SW1/4	32	46N	21W
012	W Main	475694	4285128	Brushy Creek	SW1/4	SW1/4	31	46N	21W

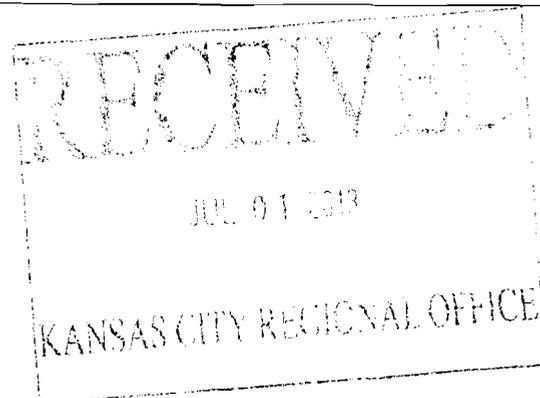


MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
PO BOX 176 JEFFERSON CITY, MO 65102

**FORM M – APPLICATION FOR STORM WATER PERMIT (FORM K OR L MUST BE INCLUDED)
UNDER THE GENERAL PERMIT: SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4)**

1. NAME OF MUNICIPALITY/AREA(S) TO BE COVERED BY THIS PERMIT Sedalia, Mo
2. PHYSICAL LOCATION OF MUNICIPALITY/AREA(S) (ADDRESS ASSIGNED) 200 S. Osage Avenue, Sedalia, MO 65301
3. TOTAL AREA OF MUNICIPALITY/AREA (S) ____ ACRES OR <u>13.1</u> SQUARE MILES.
4. A STORM WATER MANAGEMENT PROGRAM (SWMP) MUST BE DEVELOPED FOR THIS MUNICIPALITY/AREA. (THIS PROGRAM MUST BE DEVELOPED IN ACCORDANCE WITH REQUIREMENTS & GUIDELINES SPECIFIED WITHIN THE GENERAL PERMIT FOR STORM WATER DISCHARGES FROM MS4 ACTIVITIES. THE APPLICATION WILL BE CONSIDERED INCOMPLETE IF THE SWMP HAS NOT BEEN DEVELOPED IN ACCORDANCE WITH THE TERMS OF THE GENERAL PERMIT. A COPY OF THE SWMP MUST BE SUBMITTED ALONG WITH THIS APPLICATION. Revised SWMP will be submitted prior to July 1.
5. SUMMARIZE THE MEASURES FROM THE SWMP THAT WILL BE USED FOR PUBLIC EDUCATION AND OUTREACH. (ATTACH ADDITIONAL SHEETS IF NECESSARY) <u>See Attached</u>
6. SUMMARIZE THE MEASURES FROM THE SWMP THAT WILL BE USED FOR PUBLIC INVOLVEMENT AND PARTICIPATION. (ATTACH ADDITIONAL SHEETS IF NECESSARY) <u>See Attached</u>
7. SUMMARIZE THE MEASURES FROM THE SWMP THAT WILL BE USED FOR ILLICIT DISCHARGE DETECTION AND ELIMINATION. (ATTACH ADDITIONAL SHEETS IF NECESSARY) <u>See Attached</u>
8. SUMMARIZE THE MEASURES FROM THE SWMP THAT WILL BE USED FOR CONSTRUCTION SITE STORM WATER RUNOFF CONTROL. (ATTACH ADDITIONAL SHEETS IF NECESSARY) <u>See Attached</u>

MO 780-1800 (5-07)



9. SUMMARIZE THE MEASURES FROM THE SWMP THAT WILL BE USED FOR POST CONSTRUCTION STORM WATER MANAGEMENT. (ATTACH ADDITIONAL SHEETS IF NECESSARY)

See Attached

10. SUMMARIZE THE MEASURES FROM THE SWMP THAT WILL BE USED FOR POLLUTION PREVENTION AND GOOD HOUSEKEEPING. (ATTACH ADDITIONAL SHEETS IF NECESSARY)

See Attached

11. THE MUNICIPALITY/AREA(S) IS WITHIN 100 FEET OF: (CHECK EACH THAT APPLIES) FOR THOSE IDENTIFIED AS PRESENT, PLEASE IDENTIFY THEIR LOCATION IN AN ATTACHMENT.

- WATER CLASSIFIED IN CSR 20-7.031 WATER QUALITY STANDARD AS A PUBLIC DRINKING WATER SUPPLY LAKE (L1), OUTSTANDING NATIONAL OR STATE RESOURCE WATERS, OR STREAMS DESIGNATED FOR COLD-WATER SPORT FISHERY;
- STREAMS, LAKES, OR RESERVOIRS IDENTIFIED AS CRITICAL HABITAT FOR ENDANGERED SPECIES AS DETERMINED BY THE MISSOURI DEPARTMENT OF CONSERVATION AND/OR THE US FISH AND WILDLIFE SERVICE; OR

12. IS THE DISCHARGE FROM THE MS4 WITHIN 100 FEET OF WATERS CLASSIFIED AS MAJOR RESERVOIRS (L2) OR PERMANENT FLOW STREAMS (P), EXCEPT THE MISSOURI AND MISSISSIPPI RIVERS, OR WITHIN TWO STREAM MILES UPSTREAM OF BIOCRITERIA REFERENCE LOCATIONS AS DEFINED IN 10 CSR 20, CHAPTER 7?

YES NO

IF YES, PLEASE LIST THESE RECEIVING WATERS IN AN ATTACHMENT. Brushy Creek

13. IS ANY PART OF THE AREA(S) DEFINED AS WETLAND?

YES NO

NOTE: A CLEAN WATER ACT, SECTION 404 PERMIT MAY BE REQUIRED FOR THE DEVELOPMENT IN WETLAND AREA(S) FROM THE US ARMY CORPS OF ENGINEERS.

14. DOES ANY OF THE STORM WATER DISCHARGE TO A SINKHOLE, LOSING STREAM, OR ANY OTHER TOPOGRAPHICAL FEATURE THAT WOULD BE A DIRECT CONDUIT TO GROUND WATER?

YES NO

IF YES, PLEASE IDENTIFY THE LOCATION(S) OF THESE GEOLOGIC FEATURES IN AN ATTACHMENT.

15. I CERTIFY THAT I AM FAMILIAR WITH THE INFORMATION CONTAINED IN THIS APPLICATION, THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF, SUCH INFORMATION IS TRUE, COMPLETE AND ACCURATE, AND IF GRANTED THIS PERMIT, I AGREE TO ABIDE BY MISSOURI CLEAN WATER LAW AND ALL RULES, REGULATIONS, ORDERS AND DECISIONS, SUBJECT TO ANY LEGITIMATE APPEAL AVAILABLE TO AN APPLICANT UNDER THE MISSOURI CLEAL WATER LAW OF THE MISSOURI CLEAN WATER COMMISSION (ATTACH ADDITIONAL PAGES IF ADDITIONAL SIGNATURES ARE REQUIRED FOR A CO-PERMIT).

NAME(S) AND OFFICIAL TITLE(S)

Bill Beck, Jr., Public Works Director

TELEPHONE NUMBER(S)

660-827-3000

SIGNATURE(S)



DATE SIGNED

5-13-13

Form M – 5.

MCM1

1. Distribute information using the following sources: Bilingual Flyer, Web Page, BMP brochures (After the Storm, Restaurant, Automotive Shop, etc...), and SED-DRAIN newsletter.
2. Conduct education programs to the Kindergarten classes.
3. Development Community Education
4. Municipal Employee Education

Form M – 6.

MCM2

1. There shall be one public meeting held annually for the purpose of reporting on the state of the stormwater program and receiving an evaluation of the program from the Citizens' Committee for Smart Growth.
2. Events will be available for members of the community to volunteer for. The focus of these events is in three watersheds: Breakfast Branch, Pearl River, & Brushy Creek.

Form M – 7.

MCM3

1. Complete the GIS map and map all stormwater outfalls
2. Review the Illicit Discharge Detection Elimination Ordinance to determine if it is adequate to meet the MS4 permit; and that it has adequate enforcement power to control Illicit Discharges
3. Implement an illicit discharge identification and elimination plan (IDDE) that develops protocols for inspections and the steps that will be taken to locate and remove illicit discharges from the stormwater collection system; a part of the plan will be devoted to developing procedures for locating and monitoring priority areas within the City. The plan will address permit section 3.3.
4. Screen 20% of all outfalls annually and contributing source areas
5. Continue to respond to public complaints track complaint and responses
6. Educate municipal employees on the procedures and protocol for IDDE
7. Provide education to the general public on Illicit Discharge Detection and Elimination

Form M – 8.

MCM4

1. Develop written requirements, policies, procedures, and protocols for construction site stormwater management
2. Adopt formal construction site BMP manual; and Department's Protecting Water Quality Field Guide
3. Inspector training
4. Contractor training
5. Formal inspection plan

Form M – 9.

MCM5

1. Adequate leadership for this particular program: i.e. Planning, Community/Economic Development. This is one program that the Public Works Director should not have to lead directly, but rather collaboratively.
2. Ensure permit requirements are in the ordinance, along with adequate enforcement.
3. Ensure criteria are included in review and approval process up front; a sure change from past practice.
4. Training for City Planners
5. Cross reference training/education of development community with MCM1

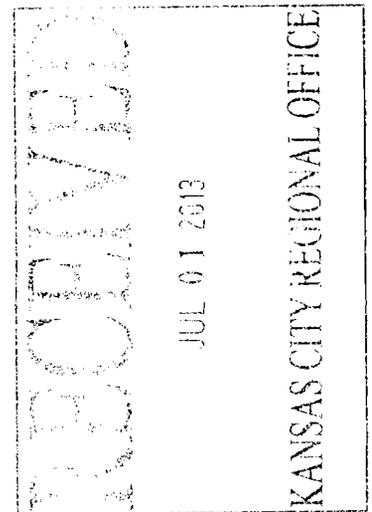
Form M- 10.

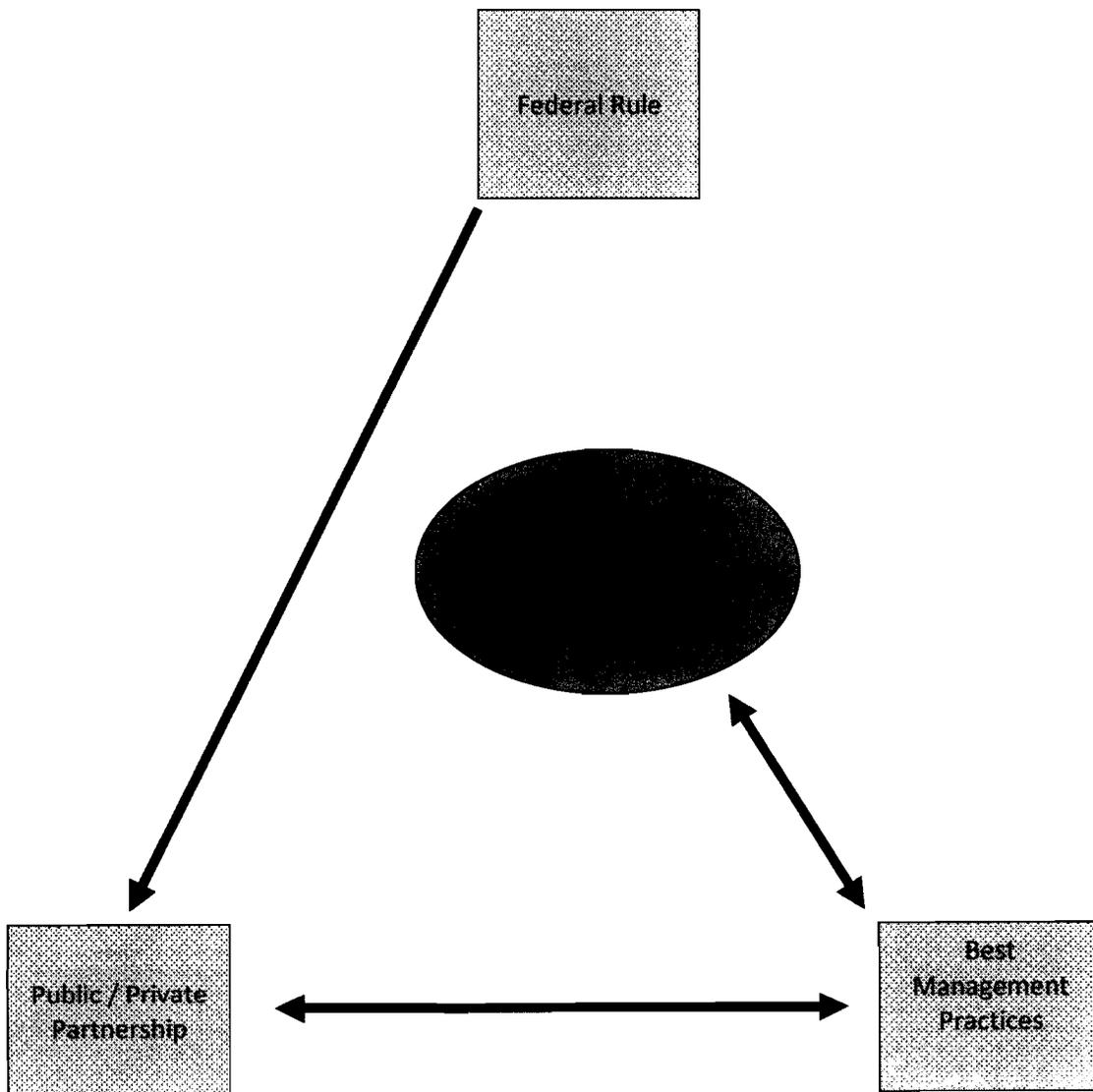
MCM6

1. Formerly adapt then adopt the St Louis County/MSD Operations and Maintenance Manual. The manual will contain elements that will satisfy the permit requirements for this minimum control measure. The process required to complete this BMP is to first review the O&M manual and determine where the manual needs to be edited to make it appropriate for Sedalia. The next step will require review of the edits to make sure that they meet the needs for Sedalia. Finally the edits will be made and the final document adopted. Adoption would require the Citizens' Committee for Smart Growth approval.
2. Develop and maintain stormwater pollution prevention plans for municipal facilities that are inspected on a routine basis (these facilities are listed in the narrative). The SWPPP are an extension of the Operations and Maintenance Manual and are written specifically for facilities of concern (high likelihood of non-stormwater discharges). The addendum filled out with the stormwater annual report lists several facilities within the SWPPP section.
3. Municipal Employee Training



Stormwater Management Plan
Sedalia Missouri





MS4 Fact Sheet

Permittee	City of Sedalia
Contact Name	Bill Beck
Address	200 S Osage Ave. Sedalia MO 65301
Phone Number	660.827.3000
Area	Approximately 13 square miles
Watersheds	Coon Creek – Muddy Creek 12DHUC - 103001030405
	Camp Branch – Flat Creek 12DHUC - 1030010205
	Walnut Creek – Flat Creek 12DHUC - 103001030301
	Shaver Creek 12DHUC - 103001030407
	Sewer Branch – Muddy Creek 12DHUC - 103001030406
Principle Streams	Breakfast Branch
	Brushy Creek
	Shaver Creek
	Pearl River (Sewer Branch – Cedar Creek)
	Tributary to Flat Creek
County	Pettis
Impaired Streams	Muddy Creek
Impairment(s)	Chlorides, Aquatic Macroinvertebrate Bioassessments
Sinkhole Discharge	NO

Introduction

The original Stormwater Management Plan written in 2003 served the purpose of getting the stormwater permit compliance effort in the City of Sedalia started. During the first ten years of the Municipal Separate Storm Sewer System (MS4) permit the following milestones were accomplished: 1, adopting key stormwater ordinances (stream bank protection, construction, post-construction, and illicit discharge detection elimination); 2, GIS mapping of the stormwater and sanitary sewer collection systems; 3, developing and implementing an Illicit Discharge Detection and Elimination Plan; 4, developing and implementing a multi-faceted public education/public participation program; and 5, making significant progress in municipal facility inspections, stormwater pollution prevention plans, and municipal employee education. With these milestones accomplished, the Sedalia Stormwater Program will move forward with a set of Best Management Practices (BMPs) that are crafted to build on the progress made in the previous 10 years.

The primary focus used to develop the 2013 Stormwater Management Plan was to create new BMPs that use the permit as the frame-work, and the past 10 years of experience, to create a concise and effective frame-work for reducing stormwater pollution discharges from the City of Sedalia to the maximum extent practicable.

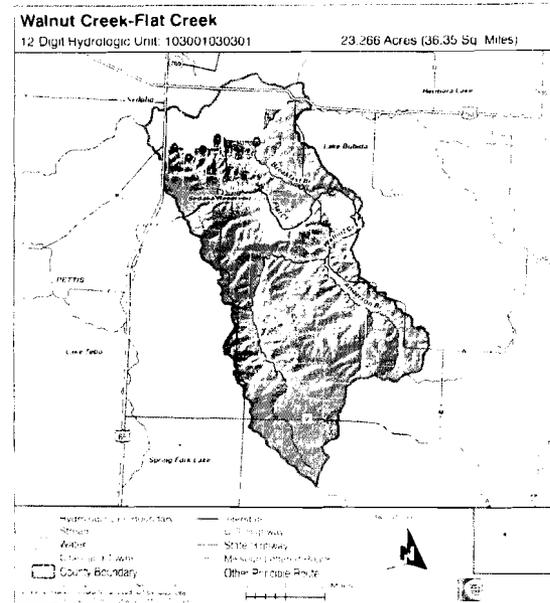
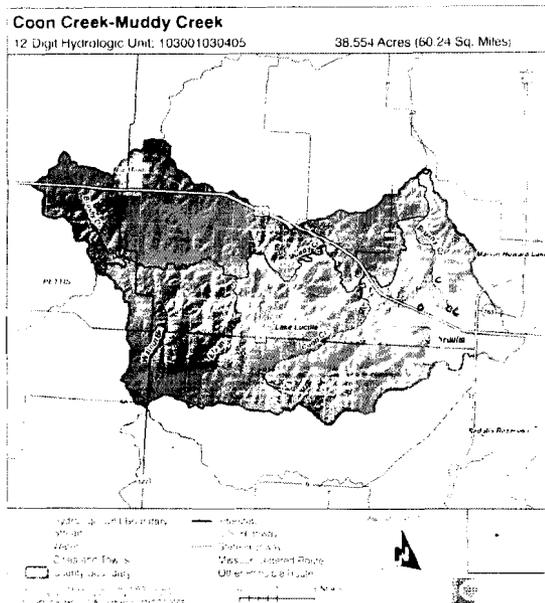
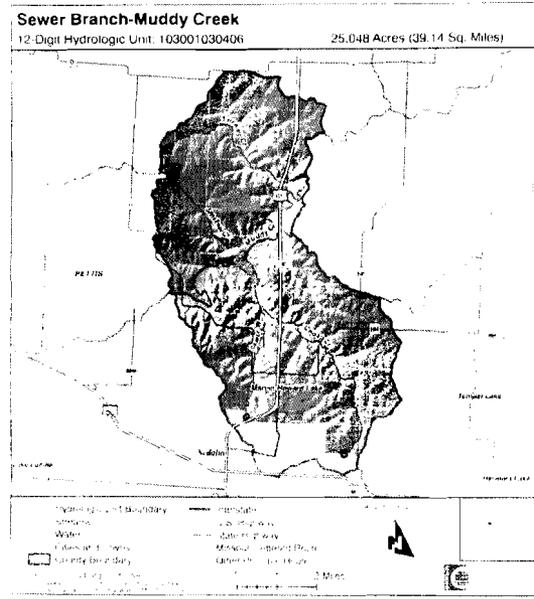
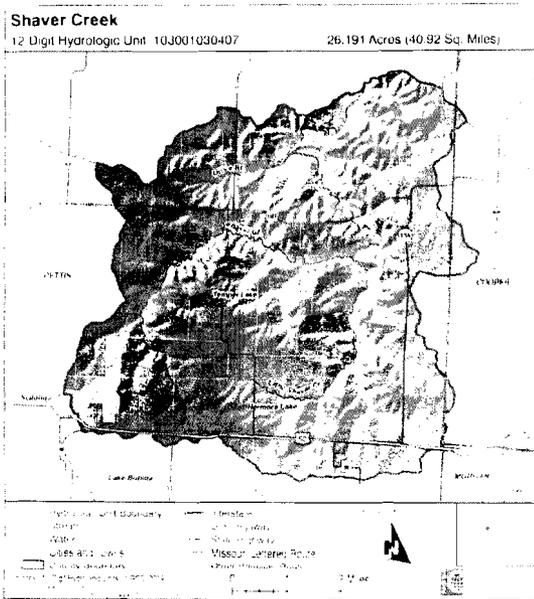
The secondary focus used to develop the 2013 Stormwater Management Plan was to create a basket of BMPs that are more streamlined, more effective, and easier to manage than the BMPs written into previous plans. This effort required that some of the old BMPs be combined and enhanced to increase the overall effectiveness of the program.

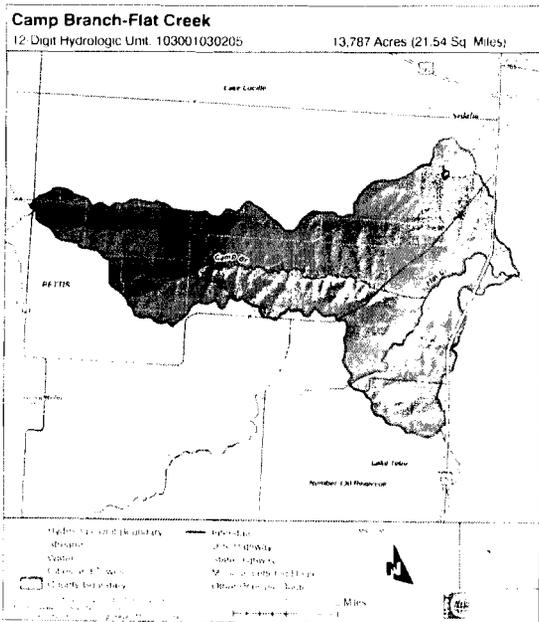
The process of rewriting the 2013 Stormwater Management Plan has ultimately resulted in changes to the basket of BMPs within the six Minimum Control Measures (MCMs). Although the new BMPs will differ somewhat from the original BMPs, the fundamental goals of the new BMPs will maintain compliance with permit standards and should prove to be more effective in getting the permit executed to the satisfaction of all concerned.

Key features of the 2013 Stormwater Management Plan include; 1, streamlining effective programs into manageable units; 2, using an increased frequency of inspections and information dissemination practices; and 3, developing an effective construction and post-construction management unit. Finally, measurement of water quality improvements will be documented by utilizing a watershed audit approach along with an increased effort in water quality monitoring activities.

Watersheds, History, Notes, Outfalls, and Water Quality

The City of Sedalia is a part of the Lamine River watershed (8-digit HUC 10300103). The City of Sedalia is surrounded by five 12-digit HUC watersheds (Shaver Creek 0407, Walnut Creek – Flat Creek 0301, Camp Branch – Flat Creek 0205, Coon Creek – Muddy Creek 0405, Sewer Branch – Muddy Creek 0205). Watershed maps are shown on the following pages.





Early History of Sedalia and notes on Muddy Creek

When the Osage Tribe lived in present day Pettis County, it was mostly open prairie. According to one history of Sedalia, there was waist high grass, Carolina parrots, passenger pigeons and plenty of bass in Pearl River, now called Sewer Branch, which runs through Sedalia. About 700 people lived in Pettis County when it was formed from west Cooper County and the southern two-thirds of Saline County on Jan. 28, 1833. The county was named for Spencer Pettis, who was the third representative to congress from Missouri and served from 1828 to 1831. Pettis was a protégé of Senator Thomas Hart Benton.

A settler named Thomas Wasson established a gristmill on Muddy Creek at Pin Hook. The settlement that grew there became the first county seat in 1833 and was called St. Helena. The county seat was moved to Georgetown (three miles north of present-day Sedalia) in 1837, and it was there that George R. Smith settled his large family when they moved to Missouri from Kentucky. Smith camped on Muddy Creek when he first arrived in November 1833. In 1857 he bought acreage, laid out the city of Sedalia and raised money to attract the Missouri Pacific Railroad to build across the high plain past Sedalia instead of along the Missouri River.

During the Civil War, both the Union and the Confederacy actively recruited in Sedalia. Even though no major battles were waged in Pettis County, civilians there suffered at the hands of both armies. The well-known benefactor of Sedalia, John H. Bothwell, arrived in 1871 at the age of 22. Sedalia's hospital, a hotel, a lodge and a rural school were all named after him. Of Muddy Creek, he commented that it was unfortunate a creek so important to the county had such a commonplace name. A picture of his niece, Ada Bothwell, appears on the cover of the book Pettis County, Missouri, A Pictorial History. She is shown canoeing a section of Muddy Creek below Bothwell Lodge around 1910. The caption reads, "When highway 65 was relocated in the early 1960s, the state dug a new creek channel which effectively drained and destroyed this idyllic spot."

On another note, untreated sewage was allowed to run into Flat and Muddy creeks until 1916. Brushy Creek is a tributary to Muddy Creek. It is also referred to as Brushy Fork and was listed as such on the 1998 303(d) list. On topographic maps and in Missouri's Water Quality Standards, however, it is called Brushy Creek. The name will be corrected in the 2002 303(d) list. This third order stream runs along the border of the prairie and the Ozark eco-regions. Its headwaters drain the west side of Sedalia and it flows northerly nearly four miles to Muddy Creek. This stream is Class P from its mouth upstream for 3.0 miles. The next one-half mile of the creek is Class C and above that it is unclassified.¹

Notes on the Pearl River (Sewer Branch)

According to a history written by W. A. McVey, the source of the Pearl River was a spring located just north of where 5th Street intersected the Katy tracks (Katy Trail). The Pearl River actually splits into two branches. One branch is the historic channel that flows through downtown, and the other flows through a pipe under the tracks and heads north where it picks up runoff from Crown Hill Cemetery. This branch of the Pearl River eventually rejoins the main stream north of Hubbard Park. As the Pearl River leaves Sedalia it widens into a substantial stream.

McVey's history described the historic path of the Pearl as heading west, then slightly north as it passed through downtown Sedalia. When the Pearl River reached downtown, it flowed through the alley between 2nd and 3rd Streets, crossed Ohio, and continued to the corner of 2nd and Kentucky. According to several versions of Sedalia's history, there was a small fish pond located at the corner of 2nd and Kentucky that was fed by the Pearl River as it flowed west and veered slightly to the north. From 2nd and Kentucky, the Pearl River ran west in close proximity to what is now Main Street, then curved north and ran along Grand until leaving the city limits and heading out into the countryside.

Citizens who lived and worked along the river had a tendency to toss trash and human wastes into the stream which eventually earned it the name "Stink Creek". Pigs also enjoyed wallowing in the water and mud which added to the stench and filth. The Pearl eventually become so rancid and disgusting the citizens of Sedalia insisted that it be directed into an underground sewer. Not only did our early townsfolk not want to see the river, they refused to call it by its proper name. Instead it bore the nicknames "Stink Creek", "S#!t Creek" and eventually the stream was officially renamed: Sewer Branch, which is how it appears on maps today.

The Pearl River has been in a state of distress since shortly after George R. Smith arrived on this prairie and founded Sedalia. Unfortunately, water quality tests have shown that only species capable of tolerating high levels of pollution currently inhabit the water. Restoring the Pearl River to health and protecting it from future contamination won't be easy. But learning about the river and participating in clean-up efforts is a great start in returning a little dignity to one of Sedalia's Historic waterways.²

The stormwater collection system constructed for the City of Sedalia has undergone significant changes over the past several years. Up until 2005 the downtown area was served by a combined sewer (in the old Pearl River watershed) which allowed the discharge of raw sewage during wet weather events at a combined sewer overflow structure (located at confluence of the two channels of the Pearl River described in the notes above) into the aptly named Sewer Branch. The stormwater and sanitary sewer systems were separated in the mid-2000s with a three phase \$4.5 million dollar project. The balance of the stormwater utility consists of a variety of ditches, curb and grate inlets, pipes, culverts, and concrete conveyances that collect and convey stormwater out of the City at 11 stormwater outfalls.

In 2009 the City of Sedalia was placed under Administrative Order on Consent #1002 to eliminate all sanitary sewer overflows and bypasses by 2016. The administrative order created the need for a comprehensive sanitary sewer system inspection effort and several sanitary sewer improvement projects. Since the sanitary sewer collection system is very closely related to the stormwater sewer collection system (MS4) in location and flow, as part of the compliance effort a stormwater master plan was developed. The stormwater master plan spawned the following projects that significantly improved MS4 permit compliance: GIS mapping, stormwater ordinances, and several planned stormwater capital improvement projects.

The stormwater collection system GIS mapping project was started in 2011. The project is approximately 90% complete. When the map is completed it will display the stormwater physical structures and how stormwater flows through the collection system. This information can be used to model flows and analyze system strengths and weaknesses so future growth can be effectively managed.

The City of Sedalia City Council passed a stormwater ordinance in July 2012 that addresses key issues regarding stream bank protection, construction, post-construction and illicit discharge detection/elimination. A significant number of BMPs in MCM 3, 4 & 5 were addressed by this ordinance

Several stormwater projects have been identified in the master plan. These projects are designed to prevent area flooding by either rerouting stormwater flows, increasing the flow capacity from one area to another, or by incorporating infiltration and/or storage devices within the collection area. The plan has defined areas where stream bank protection is appropriate.

Stormwater Outfalls

The 2008 Stormwater Management Plan listed 10 stormwater outfalls. After review there should be 11 stormwater outfalls listed in the Plan. The table below shows the outfall and their location for the 2008 and the 2013 plan. The outfall listed as 009 in the 2008 plan will be eliminated since the creek re-enters the City before leaving again at outfall #001. For reporting purposes the #009 will not be re-used. Outfall #011 and #012 will be added to the 2013 plan.

Outfall #	Location/Comment	Outfall location (UTM)		First Classified Stream	Enters Classified Stream (UTM)		303 d
		Easting	Northing		Easting	Northing	
001	28 th & New York	481917	4281907	Flat Creek	484696	4279737	No
002	Washington & 28 th	480436	4282004	Flat Creek	484696	4279737	No
003	32 nd & Kentucky	479726	4281628	Flat Creek	479992	4279299	No
004	W 32 nd & Erika	478373	4281711	Flat Creek	479992	4279299	No
011	35 th St. Terrace	479092	4281262	Flat Creek	479992	4279299	No
010	W 32 nd	476608	4281806	Flat Creek – Trib.	476388	4280551	No
005	Airport	485064	4284206	Shaver Creek	485530	4284394	No
006	Boonville	483084	4284804	Cedar Creek	482923	4287951	No
007	Sedalia Rd.	479060	4286206	Sewer Branch	479620	4290969	No
008	Central WWTP	477143	4285080	Brushy Creek	Same	Same	Yes
012	W Main	475694	4285128	Brushy Creek	476282	4286381	Yes

Water Quality

The following table shows the recent activity of Total Maximum Daily Load allocation studies that have been performed in Pettis County. Of the three TMDLs listed the one for Muddy Creek and Brushy Creek was the result of direct discharges from the City of Sedalia’s Sanitary Sewer System. Since the additions of enhanced treatment technology at the Central Wastewater Treatment plant (in 2000) the plant discharges have been protective of receiving stream designated uses.

Previous TMDLs

Year	WBID	Water Body	Pollutant	Source
2001	0856, 3490	Little Muddy Creek and Tributary to Little Muddy Creek	Temperature	Tyson Foods
2002	0855, 0859	Muddy Creek and Brushy Creek	BOD, NH ₃ -N, NFR	Central WWTP
2006	865	Flat Creek, Pettis and Benton Counties	Sediment	AG

Every two years a proposed list of impaired waters is sent to the EPA for consideration to be put on the 303d list. In 2012 a new list was created by the Department of Natural Resources. The water bodies from Pettis County that made the list are shown on the table below. The

water body shown on the list that could be influenced by the Sedalia MS4 is Muddy Creek. It is not clear at this time how the Central WWTP can be discharging chlorides. The answer to this question will become a goal for the Sedalia Water Pollution Control staff over the next several years. Since chloride is more of an MS4 issue (compared to a sanitary treatment issue) the goal of finding out why chloride is an issue will be incorporated into the Stormwater Management Plan. The BMP developed for the chloride study will be placed into the 3rd MCM – Illicit Discharge Detection.

2012 303d list of impaired waters located in Pettis County

WBID	Source	Pollutant	Imp. Use	Water Body	Imp. Dist.	Up X (UTM)	Up Y (UTM)
848.00	Unknown	DO	AQL	Heath's Creek	21.0 M	481322	4306311
3490.00	Tyson Foods	C	AQL	T to L Muddy	1 M	473619	4290956
853.00	Unknown	AMB	AQL	Muddy Creek	1.8 M	475958	4289290
853.00	Central WWTP	C	AQL	Muddy Creek	62.2 M	458158	4281745

DO – Dissolved Oxygen; C – Chloride; AMB - Aquatic Macroinvertebrate Bioassessments

Congruent to the 303d list, a schedule for performing TMDLs has been proposed by the State of Missouri. This list can be found in the annual 305b water quality report. There are five TMDLs proposed for 2014, three of those affect water bodies influenced by the City of Sedalia's small MS4. As mentioned before, a BMP for the 2013 SMP will be to conduct chloride studies on Brushy creek (a tributary to Muddy Creek); to determine if the Sedalia small MS4 has an impact on chloride levels in Muddy Creek. This information will be shared with the MDNR.

Scheduled TMDLs

Year	WBID	Water Body	Pollutant	Impaired Uses	Distance Impaired
2014	3490	Trib. to Little Muddy Creek	Chloride	AQL	1 M
2014	3490	Trib. to Little Muddy Creek	Color	General	1 M
2014	853	Muddy Creek	Chloride	AQL	39 M
2014	853	Muddy Creek	Unknown	AQL, General	62.2 M
2014	853	Muddy Creek	Color	General	1 M

Historic Water Quality Measurements

Over the past three years several samples have been collected at the City's stormwater outfalls and tested for temperature, dissolved oxygen, pH, and ammonia. The data collected is used to serve as an indication of illicit discharges. To determine if there is evidence of an illicit discharge, ranges have been constructed for each parameter tested. For example: the range set for ammonia is 0 to 2 mg/l. Any value over 2.0 may trigger an investigation to find a possible source of the high ammonia value. The table below shows data collected from the significant stormwater outfalls in the city's small MS4.

Number of values that were out of range at major stormwater outfalls over the past three years:

Parameter	Outfall	1		4		7		8		10	
		N	OOOR								
Temperature	0 to 30	11	0	10	0	12	0	12	0	7	0
pH	6.0 to 9.0	11	0	10	0	12	0	12	0	7	0
Dissolved Oxygen	>5.0	11	2	10	0	12	1	11	2	7	1
Ammonia	<2.0	10	0	9	1	11	0	11	0	6	0

N = number of samples

OOOR = Out Of Range

Coupled with water quality data is the collection of invertebrate data during spring and fall stream team activities. The following table shows data collected from the Stream Team 3168 on Breakfast Branch located at stormwater outfall 001. A new location for the invertebrate collections was started in the fall of 2012. This location assures year round water flow and takes in a larger watershed than the previous location. Another Stream Team (#2800) has been active in the Pearl River watershed. It is a goal of the Stormwater Management Plan to increase the number of stream teams working in Sedalia and to expand the invertebrate sampling to include at least the following streams: Breakfast Branch, Pearl (Sewer Branch), Brushy Creek, and the Tributary to Flat Creek.

Stream Team (#3168) Invertebrate Data

Date	Location	WQ Score	Poor	Fair	Good	Excellent
			<12	12-17	18-23	>23
5-23-10	BB	13		X		
10-24-10	BB	18			X	
4-6-11	BB	12		X		
10-5-11	BB	5	X			
4-4-12	BB	10	X			
11-16-12	BBN	5	X			

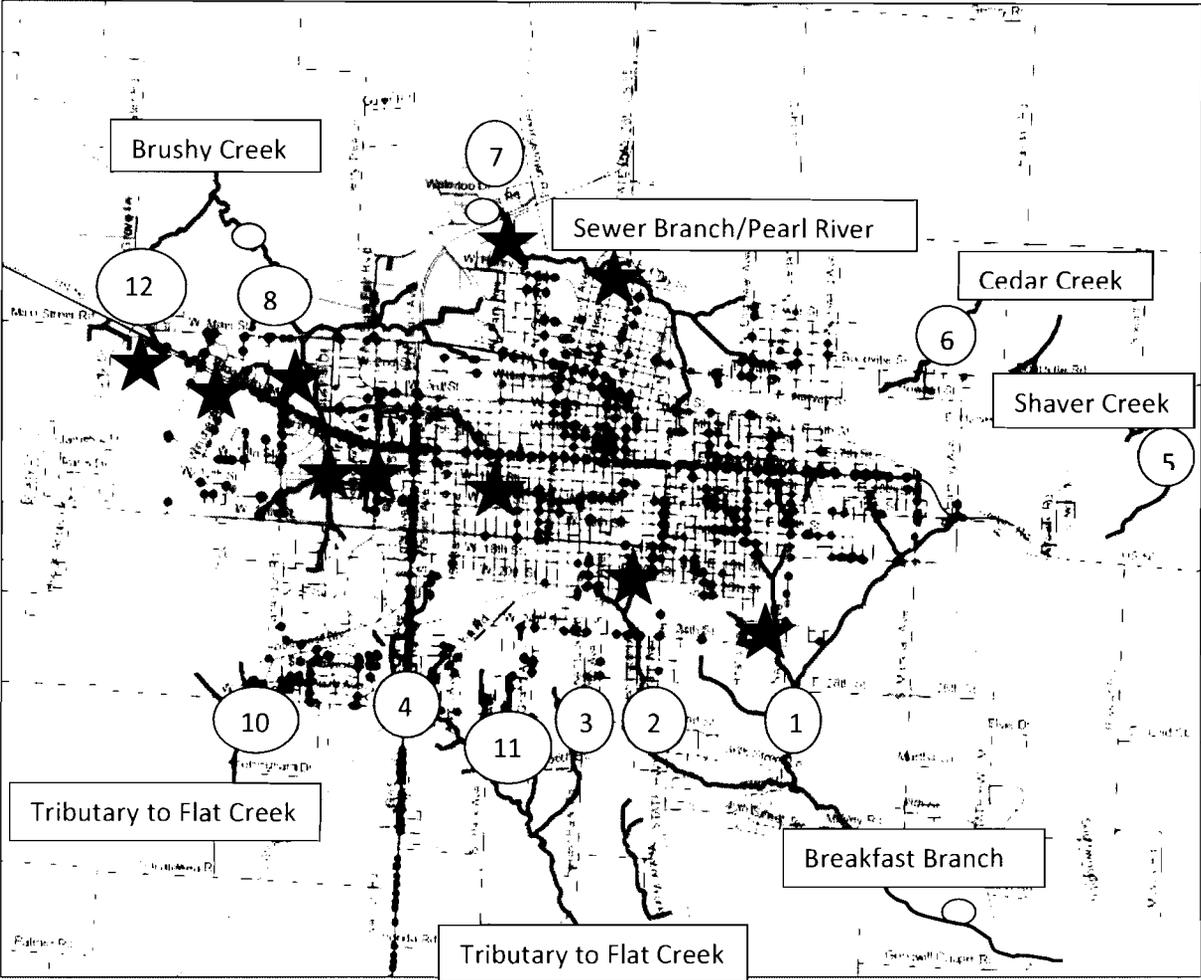
BB=Breakfast Branch (Outfall #1)

BBN=Breakfast Branch downstream from the SE Wastewater Treatment plant

As an educational component to the City's SWMP an emphasis will be placed on getting more stream teams involved in collecting data from the major watersheds located in Sedalia. The following table lists the active stream teams and the needs of the SWMP.

12 Digit HUC	Stream	Location	Stream Team
103001030301	Breakfast Branch	SE WWT plant	3168
103001030406	Pearl River	Outfall #7	2800
103001030405	Brushy Creek	Outfall #8	
103001030205	Trib. to Flat Creek	Outfall #10	

Sedalia MS4 Map



- # Representative Stormwater Outfalls
- Active WQ Test Sites (Breakfast Branch and Pearl River)
- Future WQ Test Site (Brushy Creek Chloride study & possible invertebrate sampling site)
- ★ Open Conveyance Sites
- ★ Ambient Sites

Minimum Control Measures

MCM1 Public Education

Narrative

Public Education and Outreach on Stormwater Impacts will rely on two main focus areas: first, the dissemination of information written for specific groups of people for the purpose of presenting Best Management Practices regarding the effective management of the waste that those groups have tendencies to produce; and second, an education program designed to reach three focus groups: K-12 students, the development community, and construction site workers.

The Pollutants of Concern (along with the target groups) are:

1. trash (residents, large trash dumpster users, trash collection companies, municipal employees)
2. yard waste (residents, lawn care companies, municipal employees)
3. oil and grease (restaurant employees, automotive shop employees)
4. sediments (construction site workers)
5. thermal (post construction, redevelopment, new development – developers planners etc... break up impervious surfaces)
6. nutrients/fertilizers (residents, lawn care employees, municipal employees)
7. chlorides (municipal employees)
8. pesticides (residents, pest control employees, municipal employees)
9. pet waste (pet owners)
10. hazardous chemicals (residents, municipal employees)

The strategy for providing information to the groups identified above is:

- Residents – bilingual flyer (published 3 times per year will feature a POC in 7 issues, IDD in five issues, and general stormwater information in 3 issues over the next 5 years).
- Lawn care employees – an annual letter is sent to lawn care companies about yard waste.
- Municipal employees – bilingual flyer, routine stormwater training, WPC give monthly training, this should be reduced to the same frequency as the bilingual flyer.
- Restaurant employees – restaurants should be inspected once per year, information (in the form of a flyer) is distributed during these inspections training will be offered to restaurant employees on the proper management of grease and oil waste.
- Automotive shop employees – automotive shops should be inspected once per year, information (in the form of a flyer) is distributed during these inspections.
- Construction site workers – develop and distribute a flyer that gives construction site workers tips on how to manage solids runoff from construction sites; this flyer can be distributed to contractors when construction permits are processed by City officials.
- Large trash dumpster users – if trash dumpsters are cited for improper use (lids open, etc...)
- Trash collection companies – if trash dumpsters are cited for problems (missing drain plugs, missing or damaged covers, etc...) the trash company can be contacted and given notice to correct the problems.
- Development community – training on improving the water quality of post construction runoff

Education Plan

Four targeted groups for education:

1. Residents
2. School Aged (Kindergarten)
3. Development Community (including construction site workers, developers, planners, contractors, and anyone involved in developing and redeveloping property that meets MS4 criteria)
4. Municipal Employees

Education shall be provided to Sedalia residents through the distribution of a bilingual flyer. The bilingual flyer shall be distributed twice per year.

Education shall be presented to Kindergarten classes within the Sedalia school system with a focus on pollutants of concern, trash, watersheds and stormwater policy.

Along with the education programs offered to Sedalia school children, an ongoing effort will be made to meet with Boy Scouts, Girl Scouts and youth groups to provide both a stormwater educational experience and try to get volunteers from these groups to stencil storm drains, help with watershed trash cleanups, and perform other worthwhile work.

An education program shall be developed for members of the development community who are responsible for new and in-fill construction with the City of Sedalia. An education program shall be developed for construction site workers with an emphasis placed on best management practices for erosion and soil control; and other waste management practices on construction sites.

An education program shall be developed for municipal workers. This program shall be administered twice per year; once in the spring and once in the fall.

In other areas:

The City provides a stormwater hotline for residents to call. The stormwater hotline is: 660-827-7830; people can also call 660-827-7820 to make stormwater complaints. The phone number for the hotline appears in the City's website and on most printed material that comes from the City on stormwater related issues.

The City also provides alternate information sources through the City's webpage, flyers, etc... This information will include the current edition of the City's Stormwater Management Plan, the "After the Storm" brochure, the "Restaurant" brochure, the "Automotive Shop" brochure, the stormwater hotline, and information on volunteer activities.

MCM1 BMP1 - Distribute information using the following sources: Bilingual Flyer, Web Page, BMP brochures (After the Storm, Restaurant, Automotive Shop, etc...), and SED-DRAIN newsletter.

Utilize a bilingual flyer (English & Spanish) to provide education on common Pollutants of Concern (POC) and other important storm water issues. The bilingual flyer shall be published two times per year with the utility bill that is sent to all water and sewer utility users. The bilingual flyers are published in May and September each year.

Suggested Topics

	September	May
2013-2014	Managing Yard Waste - Leaves	Managing Yard Waste - Grass
2014-2015	Managing Soil	Managing Yard Waste – Grass
2015-2016	Hazardous Chemicals	Nutrients/Fertilizers
2016-2017	Rain Barrels and Rain Gardens	Managing Oil and Grease
2017-2018	Recycling	Adopt a Storm Drain

The person responsible for this BMP is: WPC Manager

MCM1 BMP2 – Conduct education programs to the Kindergarten classes.

Kindergarten classes at Parkview, Skyline, Washington, Horace Mann, Huber Hunt, St. Paul’s, and Sacred Heart schools; and the Environmental Science classes at Smith-Cotton High School; these classes shall be given on an annual basis. The kindergarten class consists of reading a coloring/story book “Adventures of Water Drop”, and introducing students to pollutants of concern using the Water Drop Bag. Another Theme covered in the kindergarten class is “Take Care of Your Trash”. The kindergarten students are given a copy of the book along with a coloring sheet that has the message “Take Care of Your Trash”.

The person responsible for this BMP is: WPC Manager

MCM1BMP3 - Development Community Education

Stormwater policy and procedure materials shall be developed to educate developers, planners, registered architects, engineers, contractors, landscapers, construction site workers, and others involved in activities that affect the construction and post construction minimum control measures. The City of Sedalia has adopted several policies, procedures, and a basket of approved BMPS that are designed to mimic preconstruction hydrology,

MCM1BMP4 - Municipal Employee Education

Municipal employees shall receive stormwater education on an annual basis. This training shall reach all positions that have the potential to pollute stormwater.

Measurements

June 2013 to June 2014

1. Distribute a bilingual flyer in September 2013 and May 2014 the flyer shall address the management of a pollutant of concern, and also provide the storm water hotline, website address and upcoming stormwater events.
2. January through May 2014 – teach Kindergarten classes in the Sedalia School District, Sacred Heart School and Saint Paul School.
3. By June 2014 - Develop an education program for the Development Community
4. In September 2013 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
5. In May 2014 hold a stormwater training class for municipal employees in the parks and cemetery departments

June 2014 to June 2015

1. Distribute a bilingual flyer in September 2014 and May 2015 the flyer shall address the management of a pollutant of concern, and also provide the storm water hotline, website address and upcoming stormwater events.
2. January through May 2015 – teach Kindergarten classes in the Sedalia School District, Sacred Heart School and Saint Paul School.
3. Hold a reception for developers, contractors, and anyone interested in the construction and post construction minimum control measures for the purpose of providing information and education on construction and post construction policy
4. In September 2014 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
5. In May 2015 hold a stormwater training class for municipal employees in the parks and cemetery departments

June 2015 to June 2016

1. Distribute a bilingual flyer in September 2015 and May 2016 the flyer shall address the management of a pollutant of concern, and also provide the storm water hotline, website address and upcoming stormwater events.
2. January through May 2016 – teach Kindergarten classes in the Sedalia School District, Sacred Heart School and Saint Paul School.
3. Hold a reception for developers, contractors, and anyone interested in the construction and post construction minimum control measures for the purpose of providing information and education on construction and post construction policy
4. In September 2015 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
5. In May 2016 hold a stormwater training class for municipal employees in the parks and cemetery departments

June 2016 to June 2017

1. Distribute a bilingual flyer in September 2016 and May 2017 the flyer shall address the management of a pollutant of concern, and also provide the storm water hotline, website address and upcoming stormwater events.
2. January through May 2017 – teach Kindergarten classes in the Sedalia School District, Sacred Heart School and Saint Paul School.
3. Hold a reception for developers, contractors, and anyone interested in the construction and post construction minimum control measures for the purpose of providing information and education on construction and post construction policy
4. In September 2016 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
5. In May 2017 hold a stormwater training class for municipal employees in the parks and cemetery departments

June 2017 to June 2018

1. Distribute a bilingual flyer in September 2017 and May 2018 the flyer shall address the management of a pollutant of concern, and also provide the storm water hotline, website address and upcoming stormwater events.
2. January through May 2018 – teach Kindergarten classes in the Sedalia School District, Sacred Heart School and Saint Paul School.
3. Hold a reception for developers, contractors, and anyone interested in the construction and post construction minimum control measures for the purpose of providing information and education on construction and post construction policy
4. In September 2017 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
5. In May 2018 hold a stormwater training class for municipal employees in the parks and cemetery departments

MCM2 Public Participation

Narrative

The Citizens' Committee for Smart Growth (CCSG) will be responsible for evaluating the stormwater program on its successes and providing periodic guidance on how to improve the stormwater program. It is important to have the CCSG involved in stormwater affairs because the committee is approved by City Ordinance and stormwater is listed as one of its concerns. There shall be one public meeting every year where the stormwater program is evaluated and time is given for questions and answers to all concerned citizens. This meeting shall take place in June, sometime before the stormwater annual report is submitted to the State of Missouri.

Citizens will be encouraged to volunteer for a variety of stormwater events (listed below)

1. Pearl River Cleanup – several sites are available
2. Pearl River Watershed Stenciling
3. Pearl River WQ Monitoring
4. Brushy Creek Cleanup - main site is located north of Starbucks
5. Brushy Creek Watershed Stenciling
6. Brushy Creek WQ Monitoring
7. Flat Creek Outfall #4 Cleanup
8. Breakfast Branch Watershed Cleanup – two potential sites are: 28th and New York, and the Southeast Wastewater Treatment Plant outfall area
9. Breakfast Branch Watershed Stenciling
10. Breakfast Branch WQ Monitoring

Volunteers will be coordinated using City staff (when appropriate) to help on a variety of stormwater projects. The projects are all designed to clean up watersheds and raise watershed awareness. Historically, the main source of volunteers is either through the schools (Smith Cotton, Sacred Heart Catholic, and Saint Paul Lutheran), religious based youth groups, or the Boy Scouts and Girl Scouts. The field coordination for these groups comes from the teacher or the group leader. The city will provide initial guidance and education to these groups and may even employ resources for large trash pickup. The City may also provide trash bags, gloves, and vests to volunteers.

MCM2 BMP1 – There shall be one public meeting held annually for the purpose of reporting on the state of the stormwater program and receiving an evaluation of the program from the Citizens’ Committee for Smart Growth.

A general meeting shall be called by the Smart Growth Committee for the purpose of hearing a report by MS4 Plan Administrators on the accomplishments over the past year. The meeting shall be advertised and open to the public.

The person responsible for this BMP is: WPC Manager

MCM2 BMP2 – Events will be available for members of the community to volunteer for. The focus of these events is in three watersheds: Breakfast Branch, Pearl River, & Brushy Creek.

Event participation is encouraged through advertisement in the bilingual flyer and in the City’s website. The following list of events will be sponsored and advertised by the City. The City shall sponsor a minimum of two events per year.

1. Pearl River Cleanup – several sites are available
2. Pearl River Watershed Stenciling
3. Pearl River WQ Monitoring
4. Brushy Creek Cleanup - main site is located north of Starbucks
5. Brushy Creek Watershed Stenciling
6. Brushy Creek WQ Monitoring
7. Flat Creek Outfall #4 Cleanup
8. Breakfast Branch Watershed Cleanup – two potential sites are: 28th and New York, and the Southeast Wastewater Treatment Plant outfall area
9. Breakfast Branch Watershed Stenciling
10. Breakfast Branch WQ Monitoring

The person responsible for this BMP is: WPC Manager

Measurements

June 2013 to June 2014

1. The Smart Growth Committee holds an annual stormwater meeting in June 2014; the meeting is open to the public.
2. The City sponsors a fall cleanup event in 2013
3. The City sponsors a spring cleanup event in 2014

June 2014 to June 2015

1. The Smart Growth Committee holds an annual stormwater meeting in June 2015; the meeting is open to the public.
2. The City sponsors a fall cleanup event in 2014
3. The City sponsors a spring cleanup event in 2015

June 2015 to June 2016

1. The Smart Growth Committee holds an annual stormwater meeting in June 2016; the meeting is open to the public.
2. The City sponsors a fall cleanup event in 2015
3. The City sponsors a spring cleanup event in 2016

June 2016 to June 2017

1. The Smart Growth Committee holds an annual stormwater meeting in June 2017; the meeting is open to the public.
2. The City sponsors a fall cleanup event in 2016
3. The City sponsors a spring cleanup event in 2017

June 2017 to June 2018

1. The Smart Growth Committee holds an annual stormwater meeting in June 2018; the meeting is open to the public.
2. The City sponsors a fall cleanup event in 2017
3. The City sponsors a spring cleanup event in 2018

MCM3 Illicit Discharge Detection and Elimination

Narrative

A GIS map of the City's MS4 system was developed in 2011-2012. The map has a storm water layer that shows the inlets and open conveyances that make up the stormwater collection system. Information will be placed on the map that will help stormwater program administrators better manage the permit; this information will include: stormwater outfalls, watersheds, stormwater pollution priority areas, occurrences of Illicit Discharge Detection, stenciling activities, adopt a storm drain activities, and other information deemed. The map is mostly completed; the final stages of map completion will include the mapping of all stormwater outfalls.

The City of Sedalia provides several opportunities for its citizens to remove potential sources of pollution from the storm water collection system. The following examples show the direction the City has chosen to take over the past two years:

- The City sponsors a "Pick up on Demand" collection that can be scheduled twice per year for all residents. Waste removed from residential areas from using this service can be significant. Another program adopted by the City in 2013 is the Clean Sedalia Initiative. In the first of several phases a 15 square block area of the City was cleaned by over 60 volunteers. Much of the trash removed was laying in alleys and storm ditches.
- The City has operated a yard waste drop off facility for several years. Yard waste including leaves, grass clippings, and waste tree branches are deposited at the facility year round.
- A recycling center was established in a partnership between the City and the Center for Human Services. The Recycling Center has expanded to include a drop off facility located at the Thompson Hill Shopping Center. The amount of most materials collected at the recycling center and drop off site has increased every year. Report on it
- The City partners with the County in holding an annual Hazardous Waste Pickup.

The City also provides funding and oversight on the following activities:

1. Pearl River Project - a \$30,000 project designed to rehabilitate the Pearl River watershed through the use of stream bank restoration, trash removal, and storm drain stenciling activities.
2. Chloride Study – a project that will be developed to study the levels of chloride in Brushy Creek; a TMDL is being developed in Brushy Creek for Chloride and the City is very interested in tracking Chloride levels in Brushy Creek to determine what can be done about reducing chloride levels, if in fact the levels are found to be high.
3. Stream Team Water Quality Monitoring – the City encourages active participation of stream teams in the various watersheds surrounding the City; currently there are two active stream teams that perform water quality monitoring, these teams provide a tremendous educational opportunity

MCM2BMP1

Complete the GIS map and map all stormwater outfalls

The person responsible for this BMP is the Public Works Project Manager

MCM3BMP2

Review the Illicit Discharge Detection Elimination Ordinance to determine if it is adequate to meet the MS4 permit; and that it has adequate enforcement power to control Illicit Discharges

The person responsible for this BMP is the Public Works Director

MCM3BMP3

Implement an illicit discharge identification and elimination plan (IDDE) that develops protocols for inspections and the steps that will be taken to locate and remove illicit discharges from the stormwater collection system; a part of the plan will be devoted to developing procedures for locating and monitoring priority areas within the City. The plan will address permit section 3.3.

The person responsible for this BMP is Water Pollution Control Manager

MCM3BMP4

Screen 20% of all outfalls annually and contributing source areas

The person responsible for this BMP is the Water Pollution Control Manager

MCM3BMP5

Continue to respond to public complaints track complaint and responses

The person responsible for this BMP is the Water Pollution control Manager

MCM3BMP6

Educate municipal employees on the procedures and protocol for IDDE

The person responsible for this BMP is the Water Pollution control Manager

MCM3BMP7

Provide education to the general public on Illicit Discharge Detection and Elimination

The person responsible for this BMP is the Water Pollution control Manager

Measurements

June 2013 to June 2014

1. Complete storm water outfall mapping
2. Review Ordinance
3. Develop written procedures for location and removal of pollutant sources (IDDE plan)
4. Inspect 20 % of the stormwater outfalls
5. Cross reference education with MCM1

June 2014 to June 2015

1. Implement IDDE plan
2. Make necessary changes to ordinance
3. Track complaints and responses
4. Inspect 20 % of the stormwater outfalls
5. Cross reference education with MCM1

June 2015 to June 2016

1. Track complaints and responses
2. Inspect 20 % of the stormwater outfalls
3. Cross reference education with MCM1

June 2016 to June 2017

1. Track complaints and responses
2. Inspect 20 % of the stormwater outfalls
3. Cross reference education with MCM1

June 2017 to June 2018

1. Track complaints and responses
2. Inspect 20 % of the stormwater outfalls
3. Cross reference education with MCM1

MCM4 Construction Site Storm Water Runoff Control

Narrative

The City of Sedalia passed a stormwater ordinance regulating construction site activities. The ordinance was passed on July 2, 2012. This ordinance references construction site waste controls and outlines enforcement methods.

The following BMPS have been developed to regulate construction site approval inspection and education.

MCM4BMP1

Develop written requirements, policies, procedures, and protocols for construction site stormwater management

The person responsible for this BMP is

MCM4BMP2

Adopt formal construction site BMP manual; and Department's Protecting Water Quality Field Guide

The person responsible for this BMP is

MCM4BMP3

Inspector training

The person responsible for this BMP is

MCM4BMP4

Contractor training

The person responsible for this BMP is

MCM4BMP5

Develop written instructions for a formal inspection plan

The person responsible for this BMP is

Measurements

June 2013 to June 2014

1. Develop written requirements, policies, procedures, and protocols for construction site stormwater management
2. Adopt formal construction site BMP manual
3. Develop written instructions for a formal construction site inspection plan
4. Provide one training class for construction site inspectors
5. Provide one training class for construction site workers
6. Track construction site inspections

June 2014 to June 2015

1. Provide one training class for construction site inspectors
2. Provide one training class for construction site workers
3. Track construction site inspections

June 2015 to June 2016

1. Provide one training class for construction site inspectors
2. Provide one training class for construction site workers
3. Track construction site inspections

June 2016 to June 2017

1. Provide one training class for construction site inspectors
2. Provide one training class for construction site workers
3. Track construction site inspections

June 2017 to June 2018

1. Provide one training class for construction site inspectors
2. Provide one training class for construction site workers
3. Track construction site inspections

MCM5 Post –Construction Storm Water Management in New Development and Redevelopment

Narrative

The City of Sedalia passed an ordinance on July 2, 2012 that covered post construction stormwater management. During this process 2 public meetings were held and 2 developer meetings were held. A contracted engineer was hired to write the ordinance based on current practice, permit compliance and community input.

The City will spend the next 5 years implementing and perfecting the practices and procedures required by the ordinance.

The City partnered with the contract engineer and developed a stormwater master plan. This plan included a massive information gathering campaign from residents, site specific investigations, stormwater modeling, a plan for flood control and future post construction activities in 4 districts within the city.

The following BMPS have been developed to regulate post construction site activities, also to implement new stormwater design criteria.

MCM4 BMP1

Adequate leadership for this particular program: i.e. Planning, Community/Economic Development. This is one program that the Public Works Director should not have to lead directly, but rather collaboratively.

The person responsible for this BMP is

MCM4BMP2

Performance criteria and long term O&M requirements; the MS4 permit requires a mandate for mimicking pre-construction runoff conditions (the water quality component) in all new 1+ acre land-disturbance projects (even smaller parcels if part of a common plan.) The post-construction program has to also include an incremental improvement in the redevelopment projects of one acre or more. Therefore the adoption of APWA 5600 will need to ensure that items are mandated not just recommended or allowed. In addition, we recommend that the City adopt the Missouri Guide to Green Infrastructure as a strategizing tool, because this document was written specifically for MS4 regulated MS4s to comply with the post-construction runoff control program.

The person responsible for this BMP is

MCM4MBP3

Ensure permit requirements are in the ordinance, along with adequate enforcement.

The person responsible for this BMP is

MCM4 BMP4

Ensure criteria are included in review and approval process up front; a sure change from past practice.

The person responsible for this BMP is

MCM4BMP5

Training for City Planners

The person responsible for this BMP is

MCM4 BMP6

Cross reference training/education of development community with MCM1

The person responsible for this BMP is

Measurements

June 2013 to June 2014

1. Develop a leadership position for this MCM
2. Review ordinance to determine if it meets permit requirements and provided adequate long term maintenance and enforcement.
3. Develop written instructions for plan review and approval
4. Provide one training session for City planners
5. Provide one training reception for the development community

June 2014 to June 2015

1. Adopt changes to the ordinance if necessary
2. Provide one training session for City planners
3. Provide one training reception for the development community

June 2015 to June 2016

1. Provide one training session for City planners
2. Provide one training reception for the development community

June 2016 to June 2017

1. Provide one training session for City planners
2. Provide one training reception for the development community

June 2017 to June 2018

1. Provide one training session for City planners
2. Provide one training reception for the development community

MCM6 Pollution Prevention/Good Housekeeping for Municipal Operations

Narrative

The Metropolitan Sewer District in St. Louis MO has adopted an Operation and Maintenance Manual that addresses the key permit requirements of this MCM. Administrators of the City's MS4 permit have been aware of the MSD manual for several years and use it regularly to help write stormwater pollution prevention plans, and for staff training. In order for the City to adopt the manual there will have to be revisions made to specific information on facility names and locations, and review of the best management practices. The administrators of the MS4 program recommend that the MSD manual get changed where necessary and then be presented to department heads for their comment. A final editing of the manual will be necessary and then it can be formally adopted as the framework for meeting the elements of MCM 6.

The City currently inspects several facilities on a monthly basis, provides training to WPC staff, and has written SWPP Plans for the wastewater treatment plants, the public works campus, and the 7 parks (including 2 swimming pools.) The City also regularly maintains several stormwater inlet structures, sweeps several streets, disposes of waste properly, and is cognizant of reducing the amount of pesticides it uses.

One of the keys for a successful municipal pollution prevention program is to increase the frequency of facility inspections; the city has seen positive results in both the public and the private sector when facilities are inspected and problems noted and discussed with responsible individuals. The facilities that are routinely inspected will be public facilities identified in the table below.

Facility Name	Department	SWPPP	POC	IF
WPC Shop	Public Works	Yes	O&G; T; HC	1/month
North WWTP		Yes	N&F, P, O&G, T, HC	
Central WWTP		Yes	N&F, P, O&G, T, HC	
Southeast WWTP		Yes	N&F, P, O&G, T, HC	
Compost Facility		No	N&F, O&G, T	
Lab		Yes	T, HC	
Upper Barn		Yes	O&G; T; HC	
Lower Barn		Yes	O&G; T; HC	
Sanitation-Wash Bay		Yes	C, O&G, T,	
Salt Barn		Yes	C	
Vehicle Maintenance		Yes	O&G, T, HC	
Liberty Park	Park & Rec.	No	N&F; P; T; YW	
Liberty Park Shop		No	O&G, T, HC	
Liberty Park Pool		No	T; HC	
Centennial Park		No	N&F; P; T; YW	
Centennial Park Shop		No	O&G, T, HC	
Centennial Park Pool		No	T; HC	
Clover Dell Park		No	N&F; P; T; YW	
Clover Dell Park Shop		No	O&G, T, HC	
Vermont Park		No	N&F; P; T; YW	
Hubbard Park		No	N&F; P; T; YW	
Howsel Park		No	N&F; P; T; YW	
Katy Park		No	N&F; P; T; YW	
Cemetery Shop	Cemetery	No	T; HC	
Building Maintenance Shop	City Hall	No	T; HC	

S=solids; N&F=nutrients and fertilizers; C=chlorides; P=pesticides; O&G=oil and grease; T=trash; YW=yard waste; HC=hazardous chemicals

MCM6 BMP1 –

Adapt then formally adopt the Operations and Maintenance Manual (O&MM) written for the communities within the St. Louis Metropolitan Sewer District. The manual will contain written policies and best management practices that will satisfy the permit requirements for this minimum control measure. The process required to complete this BMP is to first review and edit the O&MM to make it appropriate for Sedalia. The next step will be to present the manual to the Park Board and the Water Board for their approval and finally the smart Growth Committee and City Council for formal adoption.

The person responsible for this BMP is the WPC Manager

MCM6 BMP2 – Develop and maintain stormwater pollution prevention plans for municipal facilities that are inspected on a routine basis (these facilities are listed in the narrative). The SWPPP are an extension of the Operations and Maintenance Manual and are written specifically for facilities of concern (high likelihood of non-stormwater discharges). The addendum filled out with the stormwater annual report lists several facilities within the SWPPP section.

These facilities are:

1. Public parks (including ball fields) – Liberty, Centennial, Clover Dell, Vermont, Katy, Housel, & Hubbard
2. Municipal construction activities (including those disturbing less than one acre)
3. Municipal turf/landscape activities
4. Municipal fueling – fueling facility in public works campus
5. Operation and maintenance activities
6. Municipal maintenance yards – WPC pipe yard, Street/Sanitation yard, Liberty Park yard
7. Municipal waste handling and disposal areas – Compost sludge storage site, North plant drying bed (Vacuum truck debris), Central plant drying bed (Vacuum truck debris), Mill Street (street sweeper), Water Department dump site (waste material from excavations)
8. Other municipal operations

The person responsible for this BMP is the WPC Manager

MCM6 BMP3

Cross reference with MCM1 - Municipal Employee Training

The person responsible for this BMP is the WPC Manager

Measurements

June 2013 to June 2014

1. Review O&MM and make changes where needed to adapt the manual to the Sedalia municipal MS4
2. Review, develop and adapt SWPPPs for the following activities:
 - a. Public parks (including ball fields) – Liberty, Centennial, Clover Dell, Vermont, Katy, Housel, & Hubbard
 - b. Municipal construction activities (including those disturbing less than one acre)
3. In September 2013 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
4. In May 2014 hold a stormwater training class for municipal employees in the parks and cemetery departments

June 2014 to June 2015

1. Formally adopt the revised O&MM
2. Review, develop and adapt SWPPPs for the following activities:
 - a. Municipal turf/landscape activities
 - b. Municipal fueling – fueling facility in public works campus
3. Perform annual audits on SWPPPS hat have been developed
4. In September 2014 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
5. In May 2015 hold a stormwater training class for municipal employees in the parks and cemetery departments

June 2015 to June 2016

1. Review, develop and adapt SWPPPs for the following activities:
 - a. Operation and maintenance activities
 - b. Municipal maintenance yards – WPC pipe yard, Street/Sanitation yard, Liberty Park yard
2. Perform annual audits on SWPPPS hat have been developed
3. In September 2015 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
4. In May 2016 hold a stormwater training class for municipal employees in the parks and cemetery departments

June 2016 to June 2017

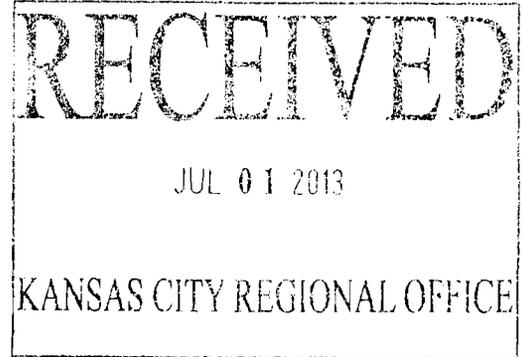
1. Review, develop and adapt SWPPPs for the following activities:
 - a. Municipal waste handling and disposal areas – Compost sludge storage site, North plant drying bed (Vacuum truck debris), Central plant drying bed (Vacuum truck debris), Mill Street (street sweeper), Water Department dump site (waste material from excavations)
 - b. Other municipal operations
2. Perform annual audits on SWPPPs that have been developed
3. In September 2016 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
4. In May 2017 hold a stormwater training class for municipal employees in the parks and cemetery departments

June 2017 to June 2018

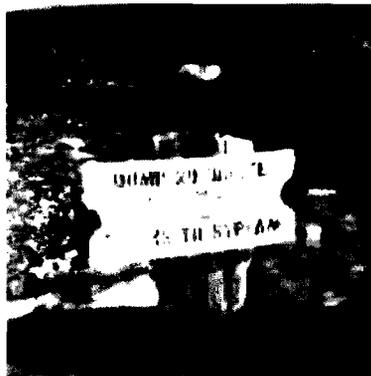
1. Perform annual audits on SWPPPs that have been developed
2. In September 2017 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
3. In May 2018 hold a stormwater training class for municipal employees in the parks and cemetery departments

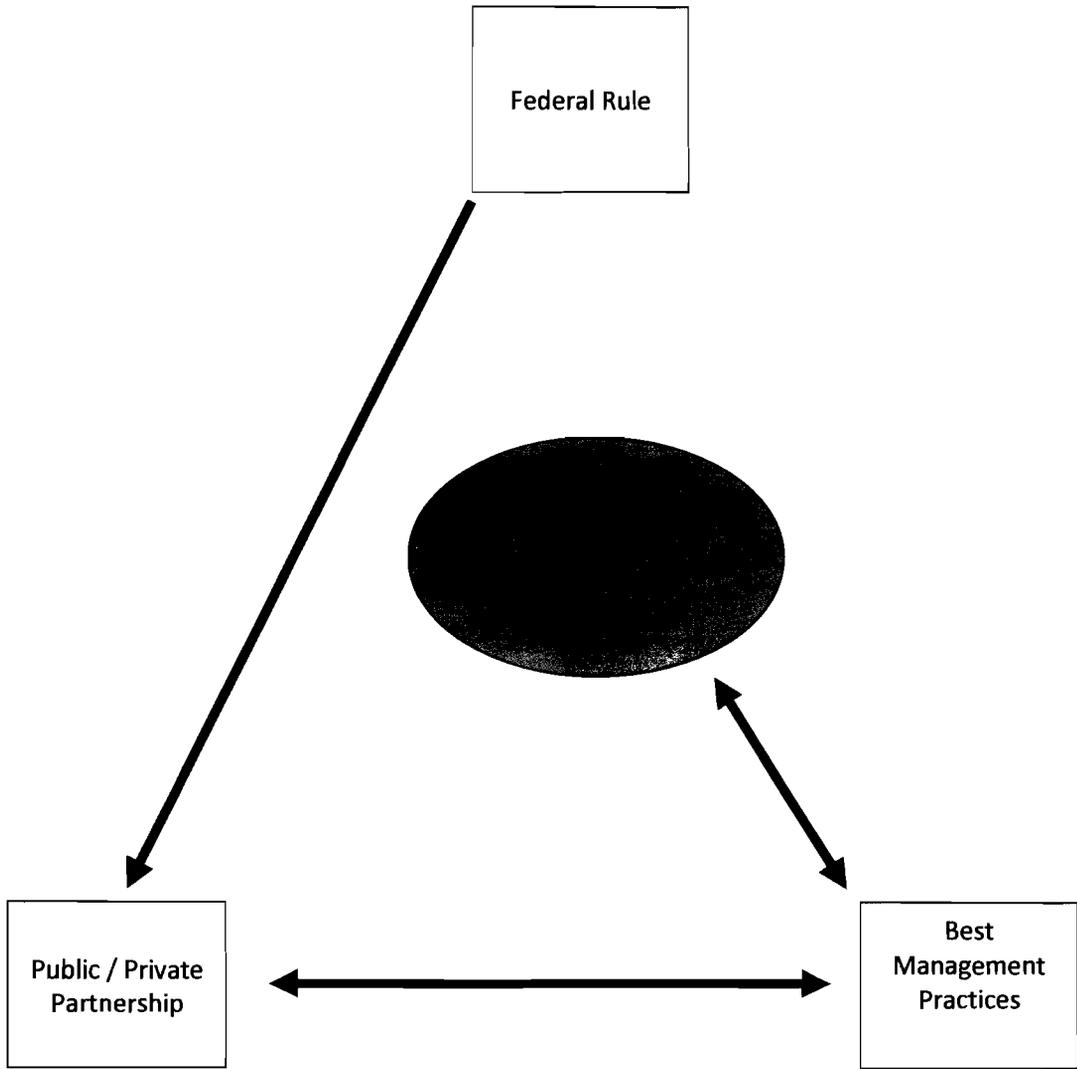
References

- 1 - Missouri Department of Natural Resources Water Pollution Control Program, TMDL for Muddy Creek and Brushy Creek, Pettis County Missouri 12-27-2001.
- 2 - Pearl River - Sedalia's Historic Waterway; Power Point Presentation; written by Mona McCormack; presented to the City of Sedalia City Council, July 2012.



Stormwater Management Plan
Sedalia Missouri





MS4 Fact Sheet

Permittee	City of Sedalia
Contact Name	Bill Beck
Address	200 S Osage Ave. Sedalia MO 65301
Phone Number	660.827.3000
Area	Approximately 13 square miles
Watersheds	Coon Creek – Muddy Creek 12DHUC - 103001030405
	Camp Branch – Flat Creek 12DHUC - 1030010205
	Walnut Creek – Flat Creek 12DHUC - 103001030301
	Shaver Creek 12DHUC - 103001030407
	Sewer Branch – Muddy Creek 12DHUC - 103001030406
Principle Streams	Breakfast Branch
	Brushy Creek
	Shaver Creek
	Pearl River (Sewer Branch – Cedar Creek)
	Tributary to Flat Creek
County	Pettis
Impaired Streams	Muddy Creek
Impairment(s)	Chlorides, Aquatic Macroinvertebrate Bioassessments
Sinkhole Discharge	NO

Introduction

The original Stormwater Management Plan written in 2003 served the purpose of getting the stormwater permit compliance effort in the City of Sedalia started. During the first ten years of the Municipal Separate Storm Sewer System (MS4) permit the following milestones were accomplished: 1, adopting key stormwater ordinances (stream bank protection, construction, post-construction, and illicit discharge detection elimination); 2, GIS mapping of the stormwater and sanitary sewer collection systems; 3, developing and implementing an Illicit Discharge Detection and Elimination Plan; 4, developing and implementing a multi-faceted public education/public participation program; and 5, making significant progress in municipal facility inspections, stormwater pollution prevention plans, and municipal employee education. With these milestones accomplished, the Sedalia Stormwater Program will move forward with a set of Best Management Practices (BMPs) that are crafted to build on the progress made in the previous 10 years.

The primary focus used to develop the 2013 Stormwater Management Plan was to create new BMPs that use the permit as the frame-work, and the past 10 years of experience, to create a concise and effective frame-work for reducing stormwater pollution discharges from the City of Sedalia to the maximum extent practicable.

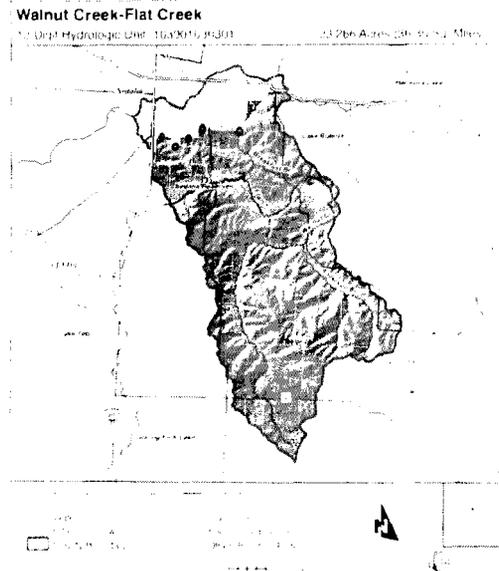
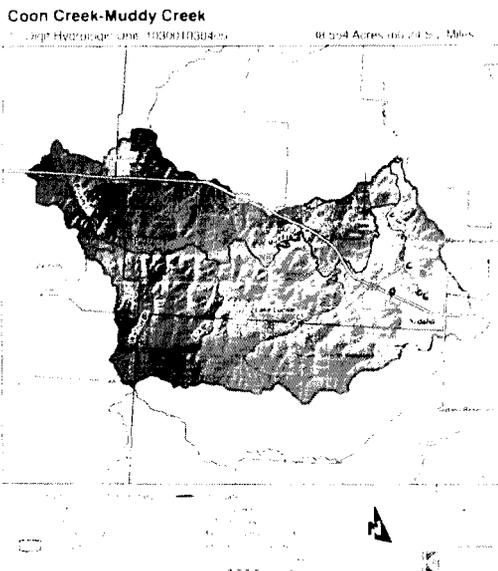
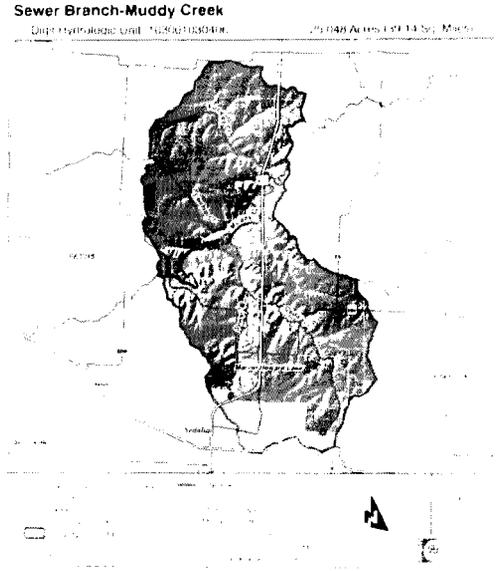
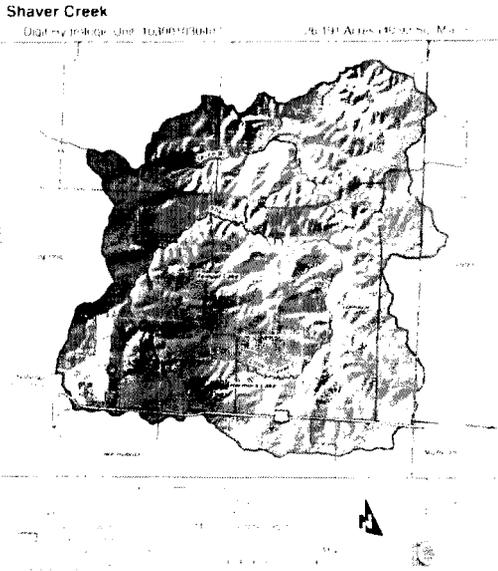
The secondary focus used to develop the 2013 Stormwater Management Plan was to create a basket of BMPs that are more streamlined, more effective, and easier to manage than the BMPs written into previous plans. This effort required that some of the old BMPs be combined and enhanced to increase the overall effectiveness of the program.

The process of rewriting the 2013 Stormwater Management Plan has ultimately resulted in changes to the basket of BMPs within the six Minimum Control Measures (MCMs). Although the new BMPs will differ somewhat from the original BMPs, the fundamental goals of the new BMPs will maintain compliance with permit standards and should prove to be more effective in getting the permit executed to the satisfaction of all concerned.

Key features of the 2013 Stormwater Management Plan include; 1, streamlining effective programs into manageable units; 2, using an increased frequency of inspections and information dissemination practices; and 3, developing an effective construction and post-construction management unit. Finally, measurement of water quality improvements will be documented by utilizing a watershed audit approach along with an increased effort in water quality monitoring activities.

Watersheds, History, Notes, Outfalls, and Water Quality

The City of Sedalia is a part of the Lamine River watershed (8-digit HUC 10300103). The City of Sedalia is surrounded by five 12-digit HUC watersheds (Shaver Creek 0407, Walnut Creek – Flat Creek 0301, Camp Branch – Flat Creek 0205, Coon Creek – Muddy Creek 0405, Sewer Branch – Muddy Creek 0205). Watershed maps are shown on the following pages.



Early History of Sedalia and notes on Muddy Creek

When the Osage Tribe lived in present day Pettis County, it was mostly open prairie. According to one history of Sedalia, there was waist high grass, Carolina parrots, passenger pigeons and plenty of bass in Pearl River, now called Sewer Branch, which runs through Sedalia. About 700 people lived in Pettis County when it was formed from west Cooper County and the southern two-thirds of Saline County on Jan. 28, 1833. The county was named for Spencer Pettis, who was the third representative to congress from Missouri and served from 1828 to 1831. Pettis was a protégé of Senator Thomas Hart Benton.

A settler named Thomas Wasson established a gristmill on Muddy Creek at Pin Hook. The settlement that grew there became the first county seat in 1833 and was called St. Helena. The county seat was moved to Georgetown (three miles north of present-day Sedalia) in 1837, and it was there that George R. Smith settled his large family when they moved to Missouri from Kentucky. Smith camped on Muddy Creek when he first arrived in November 1833. In 1857 he bought acreage, laid out the city of Sedalia and raised money to attract the Missouri Pacific Railroad to build across the high plain past Sedalia instead of along the Missouri River.

*During the Civil War, both the Union and the Confederacy actively recruited in Sedalia. Even though no major battles were waged in Pettis County, civilians there suffered at the hands of both armies. The well-known benefactor of Sedalia, John H. Bothwell, arrived in 1871 at the age of 22. Sedalia's hospital, a hotel, a lodge and a rural school were all named after him. Of Muddy Creek, he commented that it was unfortunate a creek so important to the county had such a commonplace name. A picture of his niece, Ada Bothwell, appears on the cover of the book *Pettis County, Missouri, A Pictorial History*. She is shown canoeing a section of Muddy Creek below Bothwell Lodge around 1910. The caption reads, "When highway 65 was relocated in the early 1960s, the state dug a new creek channel which effectively drained and destroyed this idyllic spot."*

On another note, untreated sewage was allowed to run into Flat and Muddy creeks until 1916. Brushy Creek is a tributary to Muddy Creek. It is also referred to as Brushy Fork and was listed as such on the 1998 303(d) list. On topographic maps and in Missouri's Water Quality Standards, however, it is called Brushy Creek. The name will be corrected in the 2002 303(d) list. This third order stream runs along the border of the prairie and the Ozark eco-regions. Its headwaters drain the west side of Sedalia and it flows northerly nearly four miles to Muddy Creek. This stream is Class P from its mouth upstream for 3.0 miles. The next one-half mile of the creek is Class C and above that it is unclassified.¹

Notes on the Pearl River (Sewer Branch)

According to a history written by W. A. McVey, the source of the Pearl River was a spring located just north of where 5th Street intersected the Katy tracks (Katy Trail). The Pearl River actually splits into two branches. One branch is the historic channel that flows through downtown, and the other flows through a pipe under the tracks and heads north where it picks up runoff from Crown Hill Cemetery. This branch of the Pearl River eventually rejoins the main stream north of Hubbard Park. As the Pearl River leaves Sedalia it widens into a substantial stream.

McVey's history described the historic path of the Pearl as heading west, then slightly north as it passed through downtown Sedalia. When the Pearl River reached downtown, it flowed through the alley between 2nd and 3rd Streets, crossed Ohio, and continued to the corner of 2nd and Kentucky. According to several versions of Sedalia's history, there was a small fish pond located at the corner of 2nd and Kentucky that was fed by the Pearl River as it flowed west and veered slightly to the north. From 2nd and Kentucky, the Pearl River ran west in close proximity to what is now Main Street, then curved north and ran along Grand until leaving the city limits and heading out into the countryside.

Citizens who lived and worked along the river had a tendency to toss trash and human wastes into the stream which eventually earned it the name "Stink Creek". Pigs also enjoyed wallowing in the water and mud which added to the stench and filth. The Pearl eventually become so rancid and disgusting the citizens of Sedalia insisted that it be directed into an underground sewer. Not only did our early townfolk not want to see the river, they refused to call it by its proper name. Instead it bore the nicknames "Stink Creek", "S#!t Creek" and eventually the stream was officially renamed: Sewer Branch, which is how it appears on maps today.

The Pearl River has been in a state of distress since shortly after George R. Smith arrived on this prairie and founded Sedalia. Unfortunately, water quality tests have shown that only species capable of tolerating high levels of pollution currently inhabit the water. Restoring the Pearl River to health and protecting it from future contamination won't be easy. But learning about the river and participating in clean-up efforts is a great start in returning a little dignity to one of Sedalia's Historic waterways.²

The stormwater collection system constructed for the City of Sedalia has undergone significant changes over the past several years. Up until 2005 the downtown area was served by a combined sewer (in the old Pearl River watershed) which allowed the discharge of raw sewage during wet weather events at a combined sewer overflow structure (located at confluence of the two channels of the Pearl River described in the notes above) into the aptly named Sewer Branch. The stormwater and sanitary sewer systems were separated in the mid-2000s with a three phase \$4.5 million dollar project. The balance of the stormwater utility consists of a variety of ditches, curb and grate inlets, pipes, culverts, and concrete conveyances that collect and convey stormwater out of the City at 11 stormwater outfalls.

In 2009 the City of Sedalia was placed under Administrative Order on Consent #1002 to eliminate all sanitary sewer overflows and bypasses by 2016. The administrative order created the need for a comprehensive sanitary sewer system inspection effort and several sanitary sewer improvement projects. Since the sanitary sewer collection system is very closely related to the stormwater sewer collection system (MS4) in location and flow, as part of the compliance effort a stormwater master plan was developed. The stormwater master plan spawned the following projects that significantly improved MS4 permit compliance: GIS mapping, stormwater ordinances, and several planned stormwater capital improvement projects.

The stormwater collection system GIS mapping project was started in 2011. The project is approximately 90% complete. When the map is completed it will display the stormwater physical structures and how stormwater flows through the collection system. This information can be used to model flows and analyze system strengths and weaknesses so future growth can be effectively managed.

The City of Sedalia City Council passed a stormwater ordinance in July 2012 that addresses key issues regarding stream bank protection, construction, post-construction and illicit discharge detection/elimination. A significant number of BMPs in MCM 3, 4 & 5 were addressed by this ordinance.

Several stormwater projects have been identified in the master plan. These projects are designed to prevent area flooding by either rerouting stormwater flows, increasing the flow capacity from one area to another, or by incorporating infiltration and/or storage devices within the collection area. The plan has defined areas where stream bank protection is appropriate.

Stormwater Outfalls

As part of the GIS mapping effort a period of time will be spent during the first year of the new MS4 permit cycle (2013 to 2014) identifying all the stormwater outfalls in the City of Sedalia MS4. The definition of an outfall is any concentrated flow of stormwater that is exiting the Sedalia City limits. Criteria used for identifying outfalls will be: flow that is concentrated in a ditch, pipe, or other structure specifically designed to carry stormwater. After identification, all stormwater outfalls will be listed on the GIS map and a schedule will be developed for screening them once per permit cycle (5 years).

Major Stormwater Outfalls

The 2008 Stormwater Management Plan listed 10 major stormwater outfalls. After review there should be 11 major stormwater outfalls listed in the Plan. The table below shows the outfall and their location for the 2008 and the 2013 plan. The outfall listed as 009 in the 2008 plan will be eliminated since the creek re-enters the City before leaving again at outfall #001. For reporting purposes the #009 will not be re-used. Outfall #011 and #012 will be added to the 2013 plan.

Outfall #	Location/Comment	Outfall location (UTM)		First Classified Stream	Enters Classified Stream (UTM)		303 d
		Easting	Northing		Easting	Northing	
001	28 th & New York	481917	4281907	Flat Creek	484696	4279737	No
002	Washington & 28 th	480436	4282004	Flat Creek	484696	4279737	No
003	32 nd & Kentucky	479726	4281628	Flat Creek	479992	4279299	No
004	W 32 nd & Erika	478373	4281711	Flat Creek	479992	4279299	No
011	35 th St. Terrace	479092	4281262	Flat Creek	479992	4279299	No
010	W 32 nd	476608	4281806	Flat Creek – Trib.	476388	4280551	No
005	Airport	485064	4284206	Shaver Creek	485530	4284394	No
006	Boonville	483084	4284804	Cedar Creek	482923	4287951	No
007	Sedalia Rd.	479060	4286206	Sewer Branch	479620	4290969	No
008	Central WWTP	477143	4285080	Brushy Creek	Same	Same	Yes
012	W Main	475694	4285128	Brushy Creek	476282	4286381	Yes

Water Quality

The following table shows the recent activity of Total Maximum Daily Load allocation studies that have been performed in Pettis County. Of the three TMDLs listed the one for Muddy Creek and Brushy Creek was the result of direct discharges from the City of Sedalia's Sanitary Sewer System. Since the additions of enhanced treatment technology at the Central Wastewater Treatment plant (in 2000) the plant discharges have been protective of receiving stream designated uses.

Previous TMDLs

Year	WBID	Water Body	Pollutant	Source
2001	0856, 3490	Little Muddy Creek and Tributary to Little Muddy Creek	Temperature	Tyson Foods
2002	0855, 0859	Muddy Creek and Brushy Creek	BOD, NH ₃ -N, NFR	Central WWTP
2006	865	Flat Creek, Pettis and Benton Counties	Sediment	AG

Every two years a proposed list of impaired waters is sent to the EPA for consideration to be put on the 303d list. In 2012 a new list was created by the Department of Natural Resources. The water bodies from Pettis County that made the list are shown on the table below. The water body shown on the list that could be influenced by the Sedalia MS4 is Muddy Creek. It is not clear at this time how the Central WWTP can be discharging chlorides. The answer to this question will become a goal for the Sedalia Water Pollution Control staff over the next several years. Since chloride is more of an MS4 issue (compared to a sanitary treatment issue) the goal of finding out why chloride is an issue will be incorporated into the Stormwater Management Plan. The BMP developed for the chloride study will be placed into the 3rd MCM – Illicit Discharge Detection.

2012 303d list of impaired waters located in Pettis County

WBID	Source	Pollutant	Imp. Use	Water Body	Imp. Dist.	Up X (UTM)	Up Y (UTM)
848.00	Unknown	DO	AQL	Heath's Creek	21.0 M	481322	4306311
3490.00	Tyson Foods	C	AQL	T to L Muddy	1 M	473619	4290956
853.00	Unknown	AMB	AQL	Muddy Creek	1.8 M	475958	4289290
853.00	Central WWTP	C	AQL	Muddy Creek	62.2 M	458158	4281745

DO – Dissolved Oxygen; C – Chloride; AMB - Aquatic Macroinvertebrate Bioassessments

Congruent to the 303d list, a schedule for performing TMDLs has been proposed by the State of Missouri. This list can be found in the annual 305b water quality report. There are five TMDLs proposed for 2014, three of those affect water bodies influenced by the City of Sedalia's small MS4. As mentioned before, a BMP for the 2013 SMP will be to conduct chloride studies on Brushy creek (a tributary to Muddy Creek); to determine if the Sedalia small MS4 has an impact on chloride levels in Muddy Creek. This information will be shared with the MDNR.

Scheduled TMDLs

Year	WBID	Water Body	Pollutant	Impaired Uses	Distance Impaired
2014	3490	Trib. to Little Muddy Creek	Chloride	AQL	1 M
2014	3490	Trib. to Little Muddy Creek	Color	General	1 M
2014	853	Muddy Creek	Chloride	AQL	39 M
2014	853	Muddy Creek	Unknown	AQL, General	62.2 M
2014	853	Muddy Creek	Color	General	1 M

Historic Water Quality Measurements

Over the past three years several samples have been collected at the City's stormwater outfalls and tested for temperature, dissolved oxygen, pH, and ammonia. The data collected is used to serve as an indication of illicit discharges. To determine if there is evidence of an illicit discharge, ranges have been constructed for each parameter tested. For example: the range set for ammonia is 0 to 2 mg/l. Any value over 2.0 may trigger an investigation to find a possible source of the high ammonia value. The table below shows data collected from the significant stormwater outfalls in the city's small MS4.

Number of values that were out of range at major stormwater outfalls over the past three years:

Parameter	Outfall	1		4		7		8		10	
		N	OOOR								
Temperature	0 to 30	11	0	10	0	12	0	12	0	7	0
pH	6.0 to 9.0	11	0	10	0	12	0	12	0	7	0
Dissolved Oxygen	>5.0	11	2	10	0	12	1	11	2	7	1
Ammonia	<2.0	10	0	9	1	11	0	11	0	6	0

N = number of samples

OOOR = Out Of Range

Coupled with water quality data is the collection of invertebrate data during spring and fall stream team activities. The following table shows data collected from the Stream Team 3168 on Breakfast Branch located at stormwater outfall 001. A new location for the invertebrate collections was started in the fall of 2012. This location assures year round water flow and takes in a larger watershed than the previous location. Another Stream Team (#2800) has been active in the Pearl River watershed. It is a goal of the Stormwater Management Plan to increase the number of stream teams working in Sedalia and to expand the invertebrate sampling to include at least the following streams: Breakfast Branch, Pearl (Sewer Branch), Brushy Creek, and the Tributary to Flat Creek.

Stream Team (#3168) Invertebrate Data

Date	Location	WQ Score	Poor	Fair	Good	Excellent
			<12	12-17	18-23	>23
5-23-10	BB	13		X		
10-24-10	BB	18			X	
4-6-11	BB	12		X		
10-5-11	BB	5	X			
4-4-12	BB	10	X			
11-16-12	BBN	5	X			

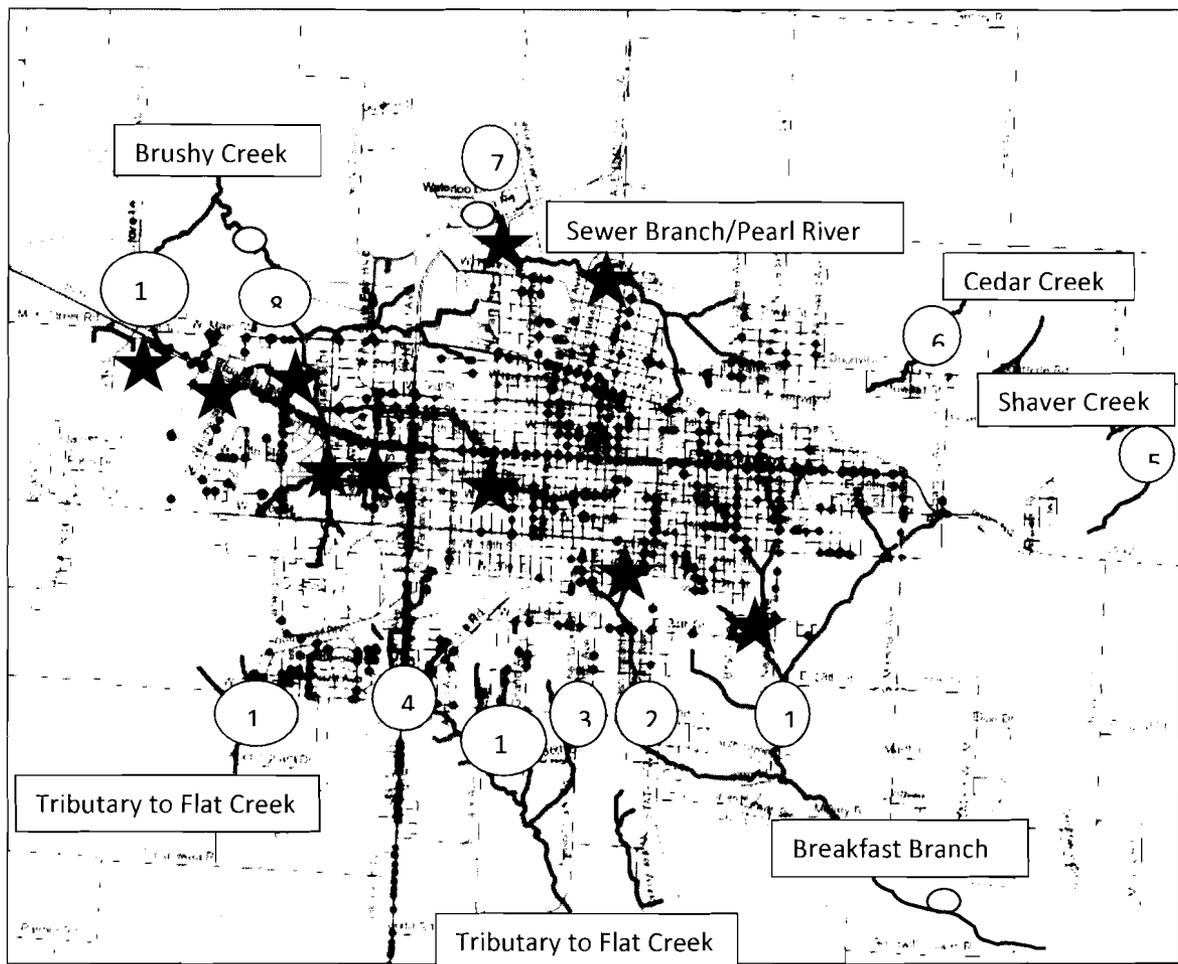
BB=Breakfast Branch (Outfall #1)

BBN=Breakfast Branch downstream from the SE Wastewater Treatment plant

As an educational component to the City's SWMP an emphasis will be placed on getting more stream teams involved in collecting data from the major watersheds located in Sedalia. The following table lists the active stream teams and the needs of the SWMP.

12 Digit HUC	Stream	Location	Stream Team
103001030301	Breakfast Branch	SE WWT plant	3168
103001030406	Pearl River	Outfall #7	2800
103001030405	Brushy Creek	Outfall #8	
103001030205	Trib. to Flat Creek	Outfall #10	

Sedalia MS4 Map



- ⊕ Major Stormwater Outfalls
- Active WQ Test Sites (Breakfast Branch and Pearl River)
- Future WQ Test Site (Brushy Creek Chloride study & possible invertebrate sampling site)
- ★ Open Conveyance Sites – Concrete ditches that may be routinely inspected for evidence of illicit discharges.
- ★ Ambient Sites – Sites that may have a higher potential for pollution (from dumping or parking lot wastes)

Minimum Control Measures

MCM1 Public Education

Narrative

Public Education and Outreach on Stormwater Impacts will rely on two main focus areas: first, the dissemination of information written for specific groups of people for the purpose of presenting Best Management Practices regarding the effective management of the waste that those groups have tendencies to produce; and second, an education program designed to reach three focus groups: K-12 students, the development community, and construction site workers.

The Pollutants of Concern (along with the target groups) are:

1. trash (residents, large trash dumpster users, trash collection companies, municipal employees)
2. yard waste (residents, lawn care companies, municipal employees)
3. oil and grease (restaurant employees, automotive shop employees)
4. sediments (construction site workers)
5. thermal (post construction, redevelopment, new development – developers planners etc... break up impervious surfaces)
6. nutrients/fertilizers (residents, lawn care employees, municipal employees)
7. chlorides (municipal employees)
8. pesticides (residents, pest control employees, municipal employees)
9. pet waste (pet owners)
10. hazardous chemicals (residents, municipal employees)

The strategy for providing information to the groups identified above is:

- Residents – bilingual flyer (published 3 times per year will feature a POC in 7 issues, IDD in five issues, and general stormwater information in 3 issues over the next 5 years).
- Lawn care employees – an annual letter is sent to lawn care companies about yard waste.
- Municipal employees – bilingual flyer, routine stormwater training, WPC give monthly training, this should be reduced to the same frequency as the bilingual flyer.
- Restaurant employees – restaurants should be inspected once per year, information (in the form of a flyer) is distributed during these inspections training will be offered to restaurant employees on the proper management of grease and oil waste.
- Automotive shop employees – automotive shops should be inspected once per year, information (in the form of a flyer) is distributed during these inspections.
- Construction site workers – develop and distribute a flyer that gives construction site workers tips on how to manage solids runoff from construction sites; this flyer can be distributed to contractors when construction permits are processed by City officials.
- Large trash dumpster users – if trash dumpsters are cited for improper use (lids open, etc...)
- Trash collection companies – if trash dumpsters are cited for problems (missing drain plugs, missing or damaged covers, etc...) the trash company can be contacted and given notice to correct the problems.
- Development community – training on improving the water quality of post construction runoff

Education Plan

Four targeted groups for education:

1. Residents
2. School Aged (Kindergarten)
3. Development Community (including construction site workers, developers, planners, contractors, and anyone involved in developing and redeveloping property that meets MS4 criteria)
4. Municipal Employees

Education shall be provided to Sedalia residents through the distribution of a bilingual flyer. The bilingual flyer shall be distributed twice per year.

Education shall be presented to Kindergarten classes within the Sedalia school system with a focus on pollutants of concern, trash, watersheds and stormwater policy.

Along with the education programs offered to Sedalia school children, an ongoing effort will be made to meet with Boy Scouts, Girl Scouts and youth groups to provide both a stormwater educational experience and try to get volunteers from these groups to stencil storm drains, help with watershed trash cleanups, and perform other worthwhile work.

An education program shall be developed for members of the development community who are responsible for new and in-fill construction with the City of Sedalia. An education program shall be developed for construction site workers with an emphasis placed on best management practices for erosion and soil control; and other waste management practices on construction sites.

An education program shall be developed for municipal workers. This program shall be administered twice per year; once in the spring and once in the fall.

In other areas:

The City provides a stormwater hotline for residents to call. The stormwater hotline is: 660-827-7830; people can also call 660-827-7820 to make stormwater complaints. The phone number for the hotline appears in the City's website and on most printed material that comes from the City on stormwater related issues.

The City also provides alternate information sources through the City's webpage, flyers, etc... This information will include the current edition of the City's Stormwater Management Plan, the "After the Storm" brochure, the "Restaurant" brochure, the "Automotive Shop" brochure, the stormwater hotline, and information on volunteer activities.

MCM1 BMP1 - Distribute information using the following sources: Bilingual Flyer, Web Page, BMP brochures (After the Storm, Restaurant, Automotive Shop, etc...), and SED-DRAIN newsletter.

Utilize a bilingual flyer (English & Spanish) to provide education on common Pollutants of Concern (POC) and other important storm water issues such as Illicit Discharge Detection Elimination (IDDE). The basic format used in the bilingual flyer shall be used to deliver information on a POC, effective Best Management Practices for controlling the POC, information on a specific aspect of IDDE, and an advertisement for community activism for upcoming cleaning/stenciling opportunities. The bilingual flyer shall be published two times per year with the utility bill that is sent to all water and sewer utility users. The bilingual flyers are published in May and September each year.

Suggested Topics

	September	May
2013-2014	Managing Yard Waste - Leaves	Managing Yard Waste - Grass
2014-2015	Managing Soil	Managing Yard Waste – Grass
2015-2016	Hazardous Chemicals	Nutrients/Fertilizers
2016-2017	Rain Barrels and Rain Gardens	Managing Oil and Grease
2017-2018	Recycling	Adopt a Storm Drain

The person responsible for this BMP is: WPC Manager

MCM1 BMP2 – Conduct education programs to the Kindergarten classes.

Kindergarten classes at Parkview, Skyline, Washington, Horace Mann, Huber Hunt, St. Paul’s, and Sacred Heart schools; and the Environmental Science classes at Smith-Cotton High School; these classes shall be given on an annual basis. The kindergarten class consists of reading a coloring/story book “Adventures of Water Drop”, and introducing students to pollutants of concern using the Water Drop Bag. Another Theme covered in the kindergarten class is “Take Care of Your Trash”. The kindergarten students are given a copy of the book along with a coloring sheet that has the message “Take Care of Your Trash”.

The person responsible for this BMP is: WPC Manager

MCM1BMP3 - Development Community Education

Stormwater policy and procedure materials shall be developed to educate developers, planners, registered architects, engineers, contractors, landscapers, construction site workers, and others involved in activities that affect the construction and post construction minimum control measures. The City of Sedalia has adopted several policies, procedures, and a basket of approved BMPS that are designed to mimic preconstruction hydrology,

The person responsible for this BMP is: Public Works Project Manager

MCM1BMP4 - Municipal Employee Education

Municipal employees shall receive stormwater education on an annual basis. This training shall reach all positions that have the potential to pollute stormwater.

The person responsible for this BMP is: WPC Manager

Measurements

June 2013 to June 2014

1. Distribute a bilingual flyer in September 2013 and May 2014 the flyer shall address the management of a pollutant of concern, and also provide the storm water hotline, website address and upcoming stormwater events.
2. January through May 2014 – teach Kindergarten classes in the Sedalia School District, Sacred Heart School and Saint Paul School.
3. By June 2014 - Develop an education program for the Development Community
4. In September 2013 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
5. In May 2014 hold a stormwater training class for municipal employees in the parks and cemetery departments

June 2014 to June 2015

1. Distribute a bilingual flyer in September 2014 and May 2015 the flyer shall address the management of a pollutant of concern, and also provide the storm water hotline, website address and upcoming stormwater events.
2. January through May 2015 – teach Kindergarten classes in the Sedalia School District, Sacred Heart School and Saint Paul School.
3. Hold a reception for developers, contractors, and anyone interested in the construction and post construction minimum control measures for the purpose of providing information and education on construction and post construction policy
4. In September 2014 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
5. In May 2015 hold a stormwater training class for municipal employees in the parks and cemetery departments

June 2015 to June 2016

1. Distribute a bilingual flyer in September 2015 and May 2016 the flyer shall address the management of a pollutant of concern, and also provide the storm water hotline, website address and upcoming stormwater events.
2. January through May 2016 – teach Kindergarten classes in the Sedalia School District, Sacred Heart School and Saint Paul School.
3. Hold a reception for developers, contractors, and anyone interested in the construction and post construction minimum control measures for the purpose of providing information and education on construction and post construction policy
4. In September 2015 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
5. In May 2016 hold a stormwater training class for municipal employees in the parks and cemetery departments

June 2016 to June 2017

1. Distribute a bilingual flyer in September 2016 and May 2017 the flyer shall address the management of a pollutant of concern, and also provide the storm water hotline, website address and upcoming stormwater events.
2. January through May 2017 – teach Kindergarten classes in the Sedalia School District, Sacred Heart School and Saint Paul School.
3. Hold a reception for developers, contractors, and anyone interested in the construction and post construction minimum control measures for the purpose of providing information and education on construction and post construction policy
4. In September 2016 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
5. In May 2017 hold a stormwater training class for municipal employees in the parks and cemetery departments

June 2017 to June 2018

1. Distribute a bilingual flyer in September 2017 and May 2018 the flyer shall address the management of a pollutant of concern, and also provide the storm water hotline, website address and upcoming stormwater events.
2. January through May 2018 – teach Kindergarten classes in the Sedalia School District, Sacred Heart School and Saint Paul School.
3. Hold a reception for developers, contractors, and anyone interested in the construction and post construction minimum control measures for the purpose of providing information and education on construction and post construction policy
4. In September 2017 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments
5. In May 2018 hold a stormwater training class for municipal employees in the parks and cemetery departments

MCM2 Public Participation

Narrative

The Citizens' Committee for Smart Growth (CCSG) will be responsible for evaluating the stormwater program on its successes and providing periodic guidance on how to improve the stormwater program. It is important to have the CCSG involved in stormwater affairs because the committee is approved by City Ordinance and stormwater is listed as one of its concerns. There shall be one public meeting every year where the stormwater program is evaluated and time is given for questions and answers to all concerned citizens. This meeting shall take place in June, sometime before the stormwater annual report is submitted to the State of Missouri.

Citizens will be encouraged to volunteer for a variety of stormwater events (listed below)

1. Pearl River Cleanup – several sites are available
2. Pearl River Watershed Stenciling
3. Pearl River WQ Monitoring
4. Brushy Creek Cleanup - main site is located north of Starbucks
5. Brushy Creek Watershed Stenciling
6. Brushy Creek WQ Monitoring
7. Flat Creek Outfall #4 Cleanup
8. Breakfast Branch Watershed Cleanup – two potential sites are: 28th and New York, and the Southeast Wastewater Treatment Plant outfall area
9. Breakfast Branch Watershed Stenciling
10. Breakfast Branch WQ Monitoring

Volunteers will be coordinated using City staff (when appropriate) to help on a variety of stormwater projects. The projects are all designed to clean up watersheds and raise watershed awareness. Historically, the main source of volunteers is either through the schools (Smith Cotton, Sacred Heart Catholic, and Saint Paul Lutheran), religious based youth groups, or the Boy Scouts and Girl Scouts. The field coordination for these groups comes from the teacher or the group leader. The city will provide initial guidance and education to these groups and may even employ resources for large trash pickup. The City may also provide trash bags, gloves, and vests to volunteers.

MCM2 BMP1 – There shall be one public meeting held annually for the purpose of reporting on the state of the stormwater program and receiving an evaluation of the program from the Citizens' Committee for Smart Growth.

A general meeting shall be called by the Smart Growth Committee for the purpose of hearing a report by MS4 Plan Administrators on the accomplishments over the past year. The meeting shall be advertised and open to the public.

The person responsible for this BMP is: WPC Manager

MCM2 BMP2 – Events will be available for members of the community to volunteer for. The focus of these events is in three watersheds: Breakfast Branch, Pearl River, & Brushy Creek.

Event participation is encouraged through advertisement in the bilingual flyer and in the City's website. The following list of events will be sponsored and advertised by the City. The City shall sponsor a minimum of two events per year.

1. Pearl River Cleanup – several sites are available
2. Pearl River Watershed Stenciling
3. Pearl River WQ Monitoring
4. Brushy Creek Cleanup - main site is located north of Starbucks
5. Brushy Creek Watershed Stenciling
6. Brushy Creek WQ Monitoring
7. Flat Creek Outfall #4 Cleanup
8. Breakfast Branch Watershed Cleanup – two potential sites are: 28th and New York, and the Southeast Wastewater Treatment Plant outfall area
9. Breakfast Branch Watershed Stenciling
10. Breakfast Branch WQ Monitoring

The person responsible for this BMP is: WPC Manager

MCM2 BMP3 – Give an annual presentation to a Boy Scout and Girl Scout leader group for the purpose of soliciting interest in storm drain stenciling.

History has shown that meetings with Boy Scout and Girl Scout leaders have helped increase participation in storm drain stenciling activities. The most recent iteration of the stencil effort has resulted in a more focused approach on watershed awareness. Therefore, when stencil projects are developed the project will include storm inlets located a specific watershed. An education program is being developed that speaks to living in a watershed, what that means, how urbanization changes watersheds, and how the stormwater inlets serve as part of the connecting network for the urbanized watershed.

The person responsible for this BMP is: WPC Manager

Measurements

June 2013 to June 2014

1. The Smart Growth Committee holds an annual stormwater meeting in June 2014; the meeting is open to the public.
2. The City sponsors a fall cleanup event in 2013
3. The City sponsors a spring cleanup event in 2014
4. Meet with Boy Scout leaders
5. Meet with Girl Scout leaders

June 2014 to June 2015

1. The Smart Growth Committee holds an annual stormwater meeting in June 2015; the meeting is open to the public.
2. The City sponsors a fall cleanup event in 2014
3. The City sponsors a spring cleanup event in 2015
4. Meet with Boy Scout Leaders
5. Meet with Girl Scout leaders

June 2015 to June 2016

1. The Smart Growth Committee holds an annual stormwater meeting in June 2016; the meeting is open to the public.
2. The City sponsors a fall cleanup event in 2015
3. The City sponsors a spring cleanup event in 2016
4. Meet with Boy Scout leaders
5. Meet with Girl Scout leaders

June 2016 to June 2017

1. The Smart Growth Committee holds an annual stormwater meeting in June 2017; the meeting is open to the public.
2. The City sponsors a fall cleanup event in 2016
3. The City sponsors a spring cleanup event in 2017
4. Meet with Boy Scout leaders
5. Meet with Girl Scout leaders

June 2017 to June 2018

1. The Smart Growth Committee holds an annual stormwater meeting in June 2018; the meeting is open to the public.
2. The City sponsors a fall cleanup event in 2017
3. The City sponsors a spring cleanup event in 2018
4. Meet with Boy Scout leaders
5. Meet with Girl Scout leaders

MCM3 Illicit Discharge Detection and Elimination

Narrative

A GIS map of the City's MS4 system was developed in 2011-2012. The map has a storm water layer that shows the inlets and open conveyances that make up the stormwater collection system. Information will be placed on the map that will help stormwater program administrators better manage the permit; this information will include: stormwater outfalls, watersheds, stormwater pollution priority areas, occurrences of Illicit Discharge Detection, stenciling activities, adopt a storm drain activities, and other information deemed. The map is mostly completed; the final stages of map completion will include the mapping of all stormwater outfalls.

The City of Sedalia provides several opportunities for its citizens to remove potential sources of pollution from the storm water collection system. The following examples show the direction the City has chosen to take over the past two years:

- The City sponsors a "Pick up on Demand" collection that can be scheduled twice per year for all residents. Waste removed from residential areas from using this service can be significant. Another program adopted by the City in 2013 is the Clean Sedalia Initiative. In the first of several phases a 15 square block area of the City was cleaned by over 60 volunteers. Much of the trash removed was laying in alleys and storm ditches.
- The City has operated a yard waste drop off facility for several years. Yard waste including leaves, grass clippings, and waste tree branches are deposited at the facility year round.
- A recycling center was established in a partnership between the City and the Center for Human Services. The Recycling Center has expanded to include a drop off facility located at the Thompson Hill Shopping Center. The amount of most materials collected at the recycling center and drop off site has increased every year. Report on it
- The City partners with the County in holding an annual Hazardous Waste Pickup.

The City also provides funding and oversight on the following activities:

1. Pearl River Project - a \$30,000 project designed to rehabilitate the Pearl River watershed through the use of stream bank restoration, trash removal, and storm drain stenciling activities.
2. Chloride Study – a project that will be developed to study the levels of chloride in Brushy Creek; a TMDL is being developed in Brushy Creek for Chloride and the City is very interested in tracking Chloride levels in Brushy Creek to determine what can be done about reducing chloride levels, if in fact the levels are found to be high.
3. Stream Team Water Quality Monitoring – the City encourages active participation of stream teams in the various watersheds surrounding the City; currently there are two active stream teams that perform water quality monitoring, these teams provide a tremendous educational opportunity

MCM3BMP1

Complete the GIS map and map all stormwater outfalls

The person responsible for this BMP is: Public Works Project Manager

MCM3BMP2

Review the Illicit Discharge Detection Elimination Ordinance to determine if it is adequate to meet the MS4 permit; and that it has adequate enforcement power to control Illicit Discharges

The person responsible for this BMP is: Public Works Director

MCM3BMP3

Implement an illicit discharge identification and elimination plan (IDDE) that develops protocols for inspections and the steps that will be taken to locate and remove illicit discharges from the stormwater collection system; a part of the plan will be devoted to developing procedures for locating and monitoring priority areas within the City. The plan will address permit section 3.3.

The person responsible for this BMP is: Water Pollution Control Manager

MCM3BMP4

Screen 20% of all outfalls annually and contributing source areas

The person responsible for this BMP is: Water Pollution Control Manager

MCM3BMP5

Continue to respond to public complaints track complaint and responses

The person responsible for this BMP is: Water Pollution Control Manager

MCM3BMP6

Educate municipal employees on the procedures and protocol for IDDE

The person responsible for this BMP is: Water Pollution Control Manager

MCM3BMP7

Provide education to the general public on Illicit Discharge Detection and Elimination

The person responsible for this BMP is: Water Pollution Control Manager

Measurements

June 2013 to June 2014

1. Complete storm water outfall mapping
2. Review Ordinance
3. Develop written procedures for location and removal of pollutant sources (IDDE plan)
4. Inspect 20 % of the stormwater outfalls
5. Cross reference education (general public MCM1BMP1, municipal employees MCM1BMP4) with MCM1

June 2014 to June 2015

1. Implement IDDE plan
2. Make necessary changes to ordinance
3. Track complaints and responses
4. Inspect 20 % of the stormwater outfalls
5. Cross reference education (general public MCM1BMP1, municipal employees MCM1BMP4) with MCM1

June 2015 to June 2016

1. Track complaints and responses
2. Inspect 20 % of the stormwater outfalls
3. Cross reference education (general public MCM1BMP1, municipal employees MCM1BMP4) with MCM1

June 2016 to June 2017

1. Track complaints and responses
2. Inspect 20 % of the stormwater outfalls
3. Cross reference education (general public MCM1BMP1, municipal employees MCM1BMP4) with MCM1

June 2017 to June 2018

1. Track complaints and responses
2. Inspect 20 % of the stormwater outfalls
3. Cross reference education (general public MCM1BMP1, municipal employees MCM1BMP4) with MCM1

MCM4 Construction Site Storm Water Runoff Control

Narrative

The City of Sedalia passed a stormwater ordinance regulating construction site activities. The ordinance was passed on July 2, 2012. This ordinance references construction site waste controls and outlines enforcement methods. This MS4 permit cycle will see a steady increase in the City of Sedalia's compliance effort in the MCM4 area. The City of Sedalia made fundamental improvements in laying the foundation for this compliance effort. First the ordinance was passed which establishes regulatory requirements soil and erosion control and for pollutant management in construction sites. Second, the City of Sedalia increased staff dedicated to monitor construction sites.

A recommendation to adopt a formal construction site BMP manual; and the Missouri Department of Natural Resources' Protecting Water Quality Field Guide will be considered during the MS4 permit cycle.

The following BMPS have been developed to regulate construction site approval, inspection, and education.

MCM4BMP1 - Develop written requirements, policies, procedures, and protocols for construction site stormwater management.

The person responsible for this BMP is: Public Works Project Manager

MCM4BMP2

Develop written instructions for a formal inspection plan.

The person responsible for this BMP is: Public Works Project Manager

MCM4BMP3 - Inspector Training – The City shall provide some type of training forum (by means of formal of classroom training, online training, and/or specialized conference attendance) for the staff that is involved in construction site inspections.

The person responsible for this BMP is: Public Works Project Manager

MCM4BMP4 - Contractor Training – The City shall provide an annual training forum for contractors and construction site workers. This training shall cover the policies and procedures that the City has developed for construction site stormwater management.

The person responsible for this BMP is: Public Works Project Manager

Measurements

June 2013 to June 2014

1. Develop written requirements, policies, procedures, and protocols for construction site stormwater management
2. Consider adopting a formal construction site BMP manual
3. Develop written instructions for a formal construction site inspection plan
4. Provide one training forum for construction site inspectors
5. Provide one training forum for construction site workers
6. Track construction site inspections

June 2014 to June 2015

1. Provide one training forum for construction site inspectors
2. Provide one training forum for construction site workers
3. Track construction site inspections

June 2015 to June 2016

1. Provide one training forum for construction site inspectors
2. Provide one training forum for construction site workers
3. Track construction site inspections

June 2016 to June 2017

1. Provide one training forum for construction site inspectors
2. Provide one training forum for construction site workers
3. Track construction site inspections

June 2017 to June 2018

1. Provide one training forum for construction site inspectors
2. Provide one training forum for construction site workers
3. Track construction site inspections

MCM5 Post –Construction Storm Water Management in New Development and Redevelopment

Narrative

The City of Sedalia passed an ordinance on July 2, 2012 that covered post construction stormwater management. During this process 2 public meetings were held and 2 developer meetings were held. A engineer was hired to write the ordinance based on current practice, permit compliance and community input. This MS4 permit cycle will see a steady increase in the City of Sedalia’s compliance effort in the MCM5 area. The City will spend the next 5 years implementing and perfecting the practices and procedures required by the ordinance. Emphasis will be placed on enforcing performance criteria and long term O&M requirements. The MS4 permit requires a mandate for mimicking pre-construction runoff conditions (the water quality component) in all new 1+ acre land-disturbance projects (even smaller parcels if part of a common plan.) The post-construction program has to also include an incremental improvement in the redevelopment projects of one acre or more. The Department of Natural Resources has gone on record to recommend that the City of Sedalia adopt the Missouri Guide to Green Infrastructure as a strategizing tool, because this document was written specifically for MS4 regulated MS4s to comply with the post-construction runoff control program.

The City partnered with the contract engineer (Olsson) and developed a stormwater master plan. This plan included a massive information gathering campaign from residents, site specific investigations, stormwater modeling, a plan for flood control and future post construction activities in 4 districts within the city.

The following BMPS have been developed to regulate post construction site activities, also to implement new stormwater design criteria.

MCM5 BMP1 - During the first year of the permit cycle (2013 to 2014) a leadership model shall be developed for this Minimum Control Measure. This is one program that the Public Works Director should not have to lead directly, but rather collaboratively with members of the economic development, municipal planning and municipal administrative staff.

The person responsible for this BMP is: City Administrator

MCM5BMP2 – Ensure that the adoption of APWA 5600 requires that policies, procedures, and BMPs are mandated not just recommended or allowed.

The person responsible for this BMP is: Public Works Director

MCM5MBP3 - Ensure permit requirements are in the ordinance, along with adequate enforcement.

The person responsible for this BMP is: Public Works Director

MCM5 BMP4 - Ensure criteria are included in review and approval process is presented and enforced at the initial phase of development planning.

The person responsible for this BMP is: Public Works Project Manager

MCM5BMP5 - Training for City Planners – train planners on what the requirements are for post-construction stormwater management.

The person responsible for this BMP is: Public Works Project Manager

MCM5 BMP6 - Cross reference training/education of development community with MCM1- The City shall provide an annual training session for any person who is a member of the development community (developers, bankers, contractors, economic developers, municipal planners, etc...). The training can take the form of an open house, formal training session, or whatever means the City chooses to distribute information on the post-construction MCM.

The person responsible for this BMP is: Public Works Project Manager

Measurements

June 2013 to June 2014

1. Assign a leadership position for this MCM (cannot be the Public Works Director)
2. Develop written instructions for plan review and approval
3. Provide one training forum for City planners
4. Provide one training forum for the development community

June 2014 to June 2015

1. Review ordinance to determine if it meets permit requirements and provided adequate long term maintenance and enforcement.
2. Provide one training forum for City planners
3. Provide one training forum for the development community

June 2015 to June 2016

1. Adopt changes to ordinance if necessary
2. Provide one training forum for City planners
3. Provide one training forum for the development community

June 2016 to June 2017

1. Provide one training forum for City planners
2. Provide one training forum for the development community

June 2017 to June 2018

1. Provide one training forum for City planners
2. Provide one training forum for the development community

MCM6 Pollution Prevention/Good Housekeeping for Municipal Operations

Narrative

The Metropolitan Sewer District in St. Louis MO has adopted an Operation and Maintenance Manual that addresses the key permit requirements of this MCM. Administrators of the City's MS4 permit have been aware of the MSD manual for several years and use it regularly to help write stormwater pollution prevention plans, and for staff training. In order for the City to adopt the manual there will have to be revisions made to specific information on facility names and locations, and review of the best management practices. The administrators of the MS4 program recommend that the MSD manual get changed where necessary and then be presented to department heads for their comment. A final editing of the manual will be necessary and then it can be formally adopted as the framework for meeting the elements of MCM 6.

The City currently inspects several facilities on a monthly basis, provides training to WPC staff, and has written SWPP Plans for the wastewater treatment plants, the public works campus, and the 7 parks (including 2 swimming pools.) The City also regularly maintains several stormwater inlet structures, sweeps several streets, disposes of waste properly, and is cognizant of reducing the amount of pesticides it uses.

One of the keys for a successful municipal pollution prevention program is to increase the frequency of facility inspections; the city has seen positive results in both the public and the private sector when facilities are inspected and problems noted and discussed with responsible individuals. The facilities that are routinely inspected will be public facilities identified in the table below.

Facility Name	Department	SWPPP	POC	IF
WPC Shop	Public Works	Yes	O&G; T; HC	1/Q
North WWTP		Yes	N&F, P, O&G, T, HC	1/Q
Central WWTP		Yes	N&F, P, O&G, T, HC	1/Q
Southeast WWTP		Yes	N&F, P, O&G, T, HC	1/Q
Compost Facility		No	N&F, O&G, T	1/Q
Lab		Yes	T, HC	A
Upper Barn		Yes	O&G; T; HC	1/M
Lower Barn		Yes	O&G; T; HC	1/M
Sanitation-Wash Bay		Yes	C, O&G, T,	1/M
Salt Barn		Yes	C	1/Q
Vehicle Maintenance		Yes	O&G, T, HC	1/M
Liberty Park	Park & Rec.	No	N&F; P; T; YW	1/M
Liberty Park Shop		No	O&G, T, HC	1/M
Liberty Park Pool		No	T; HC	1/M*
Centennial Park		No	N&F; P; T; YW	1/M
Centennial Park Shop		No	O&G, T, HC	A
Centennial Park Pool		No	T: HC	1/M*
Clover Dell Park		No	N&F; P; T; YW	1/M
Clover Dell Park Shop		No	O&G, T, HC	1/Q
Vermont Park		No	N&F; P; T; YW	1/Q
Hubbard Park		No	N&F; P; T; YW	1/Q
Howsel Park		No	N&F; P; T; YW	1/Q
Katy Park		No	N&F; P; T; YW	1/M
Cemetery Shop	Cemetery	No	T; HC	1/Q
Building Maintenance Shop	City Hall	No	T; HC	1/Q
City Hall Campus	City Hall	No	T; BS	A
Fire Station East	Fire	No	O&G	A
Fire Station West	Fire	No	O&G	A

S=solids; N&F=nutrients and fertilizers; C=chlorides; P=pesticides; O&G=oil and grease; T=trash; YW=yard waste; HC=hazardous chemicals

1/M=once per month; 1/M*=once per month (May, June, July August, September); 1/Q=once per quarter; A=annual.

MCM6 BMP1 –

Adapt then formally adopt the Operations and Maintenance Manual (O&MM) written for the communities within the St. Louis Metropolitan Sewer District. The manual will contain written policies and best management practices that will satisfy the permit requirements for this minimum control measure. The process required to complete this BMP is to first review and edit the O&MM to make it appropriate for Sedalia. The next step will be to present the manual to the Park Board and the Water Board for their approval and finally the smart Growth Committee and City Council for formal adoption.

The person responsible for this BMP is: WPC Manager

MCM6 BMP2 – Develop and maintain stormwater pollution prevention plans for municipal facilities that are inspected on a routine basis (these facilities are listed in the narrative). The SWPPP are an extension of the Operations and Maintenance Manual and are written specifically for facilities of concern (high likelihood of non-stormwater discharges). The addendum filled out with the stormwater annual report lists several facilities within the SWPPP section.

These facilities are:

1. Public parks (including ball fields) – Liberty, Centennial, Clover Dell, Vermont, Katy, Housel, & Hubbard
2. Municipal construction activities (including those disturbing less than one acre)
3. Municipal turf/landscape activities
4. Municipal fueling – fueling facility in public works campus
5. Operation and maintenance activities
6. Municipal maintenance yards – WPC pipe yard, Street/Sanitation yard, Liberty Park yard
7. Municipal waste handling and disposal areas – Compost sludge storage site, North plant drying bed (Vacuum truck debris), Central plant drying bed (Vacuum truck debris), Mill Street (street sweeper), Water Department dump site (waste material from excavations)
8. Other municipal operations

The person responsible for this BMP is: WPC Manager

MCM6 BMP3

Cross reference with MCM1 - Municipal Employee Training – Training materials will be taken from the O&MM and will focus on best management practices

Suggested Training Topics

	Topic
2013-2014	SWPPP and the O&MM
2014-2015	Material Handling and Storage/IDDE
2015-2016	Soil and Erosion Control/IDDE
2016-2017	Chemical Application/IDDE
2017-2018	Waste Disposal/IDDE

The person responsible for this BMP is: WPC Manager

Measurements

June 2013 to June 2014

1. Review O&MM and make changes where needed to adapt the manual to the Sedalia municipal MS4.
2. Review, develop and adapt SWPPPs for the following activities:
 - a. Public parks (including ball fields) – Liberty, Centennial, Clover Dell, Vermont, Katy, Housel, & Hubbard
 - b. Municipal construction activities (including those disturbing less than one acre)
3. In September 2013 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments.
4. In May 2014 hold a stormwater training class for municipal employees in the parks and cemetery departments.

June 2014 to June 2015

1. Formally adopt the revised O&MM.
2. Review, develop and adapt SWPPPs for the following activities:
 - a. Municipal turf/landscape activities
 - b. Municipal fueling – fueling facility in public works campus
3. Perform annual audits on SWPPPS hat have been developed.
4. In September 2014 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments.
5. In May 2015 hold a stormwater training class for municipal employees in the parks and cemetery departments.

June 2015 to June 2016

1. Review, develop and adapt SWPPPs for the following activities:
 - a. Operation and maintenance activities
 - b. Municipal maintenance yards – WPC pipe yard, Street/Sanitation yard, Liberty Park yard
2. Perform annual audits on SWPPPs that have been developed.
3. In September 2015 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments.
4. In May 2016 hold a stormwater training class for municipal employees in the parks and cemetery departments.

June 2016 to June 2017

1. Review, develop and adapt SWPPPs for the following activities:
 - a. Municipal waste handling and disposal areas – Compost sludge storage site, North plant drying bed (Vacuum truck debris), Central plant drying bed (Vacuum truck debris), Mill Street (street sweeper), Water Department dump site (waste material from excavations).
 - b. Other municipal operations
2. Perform annual audits on SWPPPs that have been developed.
3. In September 2016 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments.
4. In May 2017 hold a stormwater training class for municipal employees in the parks and cemetery departments.

June 2017 to June 2018

1. Perform annual audits on SWPPPs that have been developed.
2. In September 2017 hold a stormwater training class for municipal employees in the public works, vehicle maintenance, and building maintenance departments.
3. In May 2018 hold a stormwater training class for municipal employees in the parks and cemetery departments.

References

1 - Missouri Department of Natural Resources Water Pollution Control Program, TMDL for Muddy Creek and Brushy Creek, Pettis County Missouri 12-27-2001.

2 - Pearl River - Sedalia's Historic Waterway; Power Point Presentation; written by Mona McCormack; presented to the City of Sedalia City Council, July 2012.

