

14TH YEAR
NPDES ANNUAL REPORT
PERMIT # MO-0130516
May 2018 through April 2019



Submitted by
KC Water
4800 East 63rd Street
Kansas City, Missouri 64130

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ACRONYMS

APWA	American Public Works Association
ARAP	Assumptions & Attainment Plan
AE&RMS	Archibus Environmental & Risk Management System
BMPs	Best Management Practices
BOD	Biochemical oxygen demand
CERC	Columbia Environmental Research Center
City	City of Kansas City, Missouri
COD	Chemical oxygen demand
CPD	City Planning & Development
EMC	Event-mean concentration
ERMS	Archibus Environmental & Risk Management System
GIS	Geographical Information System
HHW	Household Hazardous Waste
KCEEN	Kansas City Environmental Education Network
LDD	Land Development Division
MARC	Mid-America Regional Council
MCMs	Minimum Control Measures
MDNR	Missouri Department of Natural Resources
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollution Discharge Elimination System
OEQ	Office of Environmental Quality
P&R	Parks and Recreation Department
Permit, the	MO State Operating Permit MO-0130516
PHFs	Pesticides, herbicides, and fertilizers
PWD	Public Works Department
SPCC	Spill prevention control and countermeasures
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TSD	Treatment, storage and disposal
USACE	U.S. Army Corp of Engineers
UST	Underground storage tanks
WE KC Program	Water Education for Kansas City Program
WLA	Wasteload Allocation

CERTIFICATION

As required in Part H, Section 1 of Missouri State Operating Permit No. MO-0130516, annual reports shall be signed in accordance with 40 CFR 122.22 and 10 CSR 20-6.010(2)(B) and include the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

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City of Kansas City, Missouri

Date

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INTRODUCTION

This report is submitted to the Missouri Department of Natural Resources (MDNR) by the City of Kansas City, Missouri (hereafter referred to as the City) pursuant to the conditions of the National Pollutant Discharge Elimination System (NPDES) Missouri State Operating Permit MO-0130516 (the Permit) for stormwater discharges from its municipal separate storm sewer system (MS4). The report provides an update on the permit activities conducted during the City's fiscal year May 1, 2018 through April 30, 2019 (the reporting period).

During the reporting period, the City went through a transition from its expired MS4 permit condition to a renewed permit condition. The City's first MS4 Permit cycle was September 2004 through August 2009. The City's 2nd MS4 Permit cycle started in September 2018. During the nine-year gap between 2009 and 2018, the City operated under the condition of the expired first permit. Accordingly, this report covers both the activities conducted May through August 2018 under the expired first permit condition and those from September 2018 through April 2019 under the second permit condition.

The City submitted an updated plan for its Stormwater Management Program (SWMP) in 2017. The SWMP was prepared in anticipation of the upcoming second MS4 Permit; however, the final version of the Permit contains a few changes beyond the 2017 SWMP. The City is updating the SWMP to ensure its compliance with the new permit.

The report is presented to be consistent with the layout of the requirements in the second permit and with reference to the 2017 SWMP. For each of the nine minimum control measures (MCMs) required in the Permit, a list of relevant BMPs is provided to include a description of individual BMPs, a summary of compliance status, assessment of BMPs, implementation status, plan for the next reporting cycle, any planned changes to the effective Stormwater Management Program (SWMP), as well as a summary of monitoring results, where applicable. The last part of the report are the appendices of supporting data or documents.

SECTION 1. TOTAL MAXIMUM DAILY LOAD

A. Permit Reference C. (Status: inactive) Total Maximum Daily Load (TMDL)

Per Part III, Rationale for General Terms and Conditions in the Fact Sheet of the Permit, no Total Maximum Daily Load (TMDL) has been established that include MS4 wasteload allocations, prior to the issuance of the current MS4 Permit. The Permit only requires action from the permittee when the receiving stream has an approved or established TMDL.

Should any area of the MS4 is identified in an EPA-approved or established TMDL with an applicable wasteload allocation (WLA) in the future, the City will develop a TMDL Assumption and Requirements Attainment Plan (ARAP). They will implement steps toward attainment of applicable WLA in accordance with 40 CFR 122.44(k)(2) and (3) as implemented through this permit. Pertinent activities will be captured in the annual report.

SECTION 2. MINIMUM CONTROL MEASURES (MCMs)

1. Public Education and Outreach of Stormwater Impacts

A. Permit Reference E.1-a.i. Informing the public about the stormwater impacts and helpful actions; a description of how the public is targeted

E.1-a.i. BMP 1. Utilize the Department's *What's on Tap?* newsletter sent to every water customer in their monthly water bill as a tool for wide-spread dissemination of relevant information/education

KC Water sends out a *What's on Tap?* newsletter to its water customers every other month. The newsletter is a tool to disseminate educational messages and information. During the reporting period, the following messages were delivered: *Keep Yard Waste out of the Street*; *Large Hazardous Wasteloads Accepted by Appointment*; *Leaf and Brush Collection Continues*; *Leaf-Brush Pickup Set for April*, and *Hazardous Waste Facility Ready to Serve*.

Measurable Goal: Ongoing use of the resource to provide relevant information

Status: Met goal

Next Step: Continue to use the resource to educate and reach out to the public

E.1-a.i. BMP 2. Utilize KC Water's website to provide information on stormwater management and water quality matters

During the reporting period, KC Water revamped its website, including its education page (<https://www.kcwater.us/education/>). The page currently lists various links and resources covering teacher resources, community outreach, water quality, tours, printed materials, videos, and water quality grants.

Measureable Goal: Ongoing use of the resource

Status: Met goal

Next Step: Continue to use and improve the resource

E.1-a.i. BMP 3. Use of the *KC to the Sea* curriculum in City schools

The curriculum was designed to help educate 4th through 6th grade students on the role of stormwater management in protecting the water quality in local rivers, lakes, and streams. During the reporting period, the curriculum was taught in 46 schools and 1 summer camp, reaching a total of 4,267 students in 11 different school districts.

Measureable Goal: Annual implementation during the school year.

Status: Met goal

Next Step: Continue the practices

B. Permit Reference E.1-a.ii. 1. Informing the public about the stormwater impacts and helpful actions; a list of pollutants to be addressed, including the application of pesticides, herbicides, and fertilizers

Measureable Goal: Established in the SWMP

Status: NA

E.1-a.ii.1. BMP 1. Freddy the Fish

Under the WE KC Program, KC Water staff taught *the Freddy the Fish* class to young children to educate them about various pollutants brought by human activities the Freddy will encounter during his adventure. Pesticides, oil and gasoline are among the listed pollutants. The class was taught in 19 schools, 5 summer and Girl Scout camps, and one disabled adult learning facility, reaching 1,750 students.

E.1-a.ii.1. BMP 2. Water Quality Small Grant (WQSG) Program

KC Water administers the WQSG Program to support local nonprofits in projects and activities related to water quality protection, improvement, and education within the city limits of Kansas City, Missouri. One of the grant recipients is StoneLion Puppet Theatre, an organization that is dedicated to expanding environmental education through the art of puppetry. During the reporting period, StoneLion Puppet Theatre performed a show, “The Little Red Hen’s Garden” that focuses on the effect of pesticides, herbicides, and fertilizers on waterways.

Next Step: KC Water will continue to conduct this program.

C. Permit Reference E.1-a.ii. 2. Informing the public about the stormwater impacts and helpful actions; a list of pollutants to be addressed, including the management and disposal of used oil and toxic materials

Measureable Goal: Established in the SWMP

Status: NA

E.1-a.ii.2. BMP 1.

See Section E.1.a.i. BMP 1 for details

E.1-A.ii.2. BMP 2. KC Water hosts a Trash Tally

Trash Tally is a program provided for Grades 2 and 3. It incorporates graphing and storm drain locations, and it is usually a prelude to a litter pickup or other service project. It is designed to educate students about the downhill movement of stormwater towards storm drains, as well as the types of trash commonly found in the runoff (oil, chemicals, metals are on the list). During the reporting period, Trash Tally was taught in 9 schools and reached 643 students.

Next Step: Continue to conduct these programs

D. Permit Reference E.1-a.iii. Informing the public about the stormwater impacts and helpful actions; a description of activities and materials specific to targeted audiences and pollutants

Measureable Goal: Continue the established efforts

Status: Ongoing

Next Step: KC Water will continue these activities

E.1-a.iii. BMP 1. See TABLE 1. A list of public education activities

Next Step: KC Water will continue these activities

TABLE 1. A LIST OF PUBLIC EDUCATION ACTIVITIES

Programs/ Partnerships	Achievement During this Report Period
KC Green	<ul style="list-style-type: none"> • For Earth Day, April 22, 2019, the KC Green Education and Outreach Team held a Recycling Reboot at City Hall in conjunction with Kansas City's renewed recycling initiative. They taught staff the proper way to recycle materials through three stations: 1) a list of recycling/waste reduction FAQs; 2) a recycling video featuring our City Manager; and 3) a game that taught the differences between recyclables and trash. Over 100 employees attended. • The KC Green Education and Outreach Team partnered for the 4th annual Trash Bash. On Earth Day, 52 employees removed over 1,600 pounds of trash and 20 tires from the neighborhood surrounding the Swope Campus where KC Water and the Parks & Recreation (P&R) Departments are headquartered.
Green Infrastructure Tours	<ul style="list-style-type: none"> • KC Water offers educational tours of its public green infrastructure facilities and Green Storm Infrastructure demonstration parking lot at its Swope Campus headquarters. • KC Water hosted 5 tours of the Swope Campus, reaching 120 people and 1 tour of public GSI in the Marlborough Pilot Project area for 7 students from Pittsburgh State University.
Water Education for Kansas City (WE KC Program)	<ul style="list-style-type: none"> • The program empowers youth organizations and after school groups to make good water quality choices for their future through hands-on learning and facilitation of stewardship projects. • Facilitated 18 litter pickups reaching 1,814 students and cleaning up over 3,400 pounds of trash and 10 tires • Facilitated 2 storm drain marking events, reaching 32 students and marking 53 storm drains • Held 10 watershed education events reaching 787 students
Water Quality Small Grant Program	See TABLE 2. <u>2.a.ii. BMP 5. Administer the annual Water Quality Education grant program</u>
Stormwater: From KC to the Sea	Stormwater curriculum was taught to a total of 4,267 students (4 th to 6 th grades) from 46 schools and 1 summer camp in 11 different school districts.
Stormwater Plinko	Stormwater Plinko, an educational tool, was played at 8 outreach events, reaching about 1,603 people.

Additional Education Initiatives	<ul style="list-style-type: none"> • <i>Freddy the Fish</i>. KC Water used a modified version of <i>Freddy the Fish</i> to educate 1,750 Kindergarten through 2nd grade students, spanning 19 schools, 5 summer and Girl Scout camps, 1 disabled-adult learning facility and 1 community center. • <i>Trash Tally</i>. The program was developed to educate students on how litter gets to storm drains; what types of litter are commonly seen; and how everyone can help. The program was taught at 9 schools, reaching 643 2nd and 3rd grade students. • Macro Monitoring. The class was designed to educate students on how human activities can affect the bottom dwellers in streams. The class was taught to 708 students in eleven schools and 4 additional scout and after-school groups.
The Regional Water Quality Public Education Program (MARC)	<ul style="list-style-type: none"> • KC Water continues to be a leading stakeholder for this program. • Developed a new database of homeowner and neighborhood association organizations to more directly engage citizens with information about how to prevent stormwater runoff and pollution in their communities. An email blast sharing ways to improve water quality in neighborhoods reached more than 500 homeowners and neighborhood associations. • Conducted the 8th biennial public attitude survey to gauge the public's knowledge of and attitudes about water quality in the metropolitan area. View the full report at www.marc.org/Environment/Water-Resources/Reports-and-Publications/Reports. • Hosted six webinars broadcast by the Center for Watershed Protection. Topics included stormwater runoff education, BMPs, and green Infrastructure. • \$21,000 in grant money was awarded to five local nonprofit and educational organizations for education and outreach events related to reducing stormwater runoff and improving water quality in area creeks and streams.
KC STEM Fest	<ul style="list-style-type: none"> • KC Water participated in this event hosted by Science Pioneers on September 23, 2018. The event informed kindergarten through 12th grade teachers to experience hands-on learning opportunities for their students. KC Water gave out information on the <i>KC to the Sea</i> curriculum and the <i>WE KC</i> water quality education program to over 150 area teachers. • KC Water participates in the MARC's Kansas City Environmental Educational Network (KCEEN) hosted by MARC. The mission of MARC's KCEEN is to improve environmental education for students throughout the Kansas City region by raising awareness, providing opportunities for action, and coordinating information and resources. KCEEN serves pre-K through 12th grade educators through professional development opportunities and events.

E.1-a.iii. BMP 2. Active participation and financial support for the MARC's Water Quality Education Committee (WQEC)

The City continues to be a leading stakeholder and sponsor for MARC's water quality education effort. The City paid a \$45,000 membership fee this year. KC Water staff attended the full quarterly meetings and subcommittee meetings, as appropriate, during the reporting period.

In 2018, the program developed a new database of homeowner and neighborhood association organizations to more directly engage citizens with information about how to prevent stormwater runoff and pollution in their communities. In November an email blast sharing ways to improve water quality in neighborhoods reached more than 500 homeowners and neighborhood associations. The messaging also informed readers about WQEC's mini-grant program, and featured a new animated video addressing litter, starring the water quality droplet character.

Measureable Goal: Active participation in monthly meetings and committee work

Status: Met goal

Next Step: KC Water will continue to support MARC's effort by providing the appropriate resources.

E.1-a.iii. BMP 3. Continue KC Water's participation and support for American Public Works Association's (APWA) efforts to improve and update various development standards that benefit water quality

KC Water continued to participate in the efforts by the Kansas City Metropolitan Chapter of APWA to revise stormwater-related standards that include APWA Division II. Sec. 2600 Storm Sewers and Sec. 5600 Storm Drainage Systems & Facilities, as well as Manual of Best Management Practices for Stormwater Quality through MARC.

Measurable Goal: Active participation in scheduled committee meetings and efforts.

Status: Met goal

Next Step: The City will go through the appropriate process to adopt the updated standards or manual.

E. Permit Ref. E.1.a.iv. Public reporting of illicit discharges or water quality impacts from MS4 discharges

E.1.a.iv. BMP 1. Promote, publicize, and facilitate public reporting of illicit discharges

The City uses a centralized system to provide multiple venues for residents to access City services, including addressing illicit discharges. Residents used any of the ten following reporting methods as they appear on the City's website:

1. Call the City Services hotline 311 or (816) 513-1313
2. [Report a problem online by pointing on a map](#) or typing an address
3. Download the 311 mobile app ([iOS](#) and [Android](#)) to report problems
4. Report a problem using our [online form](#)
5. City Hall Self-Service Station on the 1st floor with a phone to contact 311

6. If a citizen needed assistance, they could walk-in at 414 E. 12th St., Kansas City, MO 64106, weekdays from 8:00 AM - 5:00 PM
7. Twitter: Follow@KCMO311
8. [Fax or Mail Service Request Form](#)
9. Mail: 311, City Hall, First Floor, 414 E. 12th St., Kansas City, MO 64106
10. Fax: (816) 513-1303

Requests received through these venues receive a case number, are logged by category and routed to the appropriate City department for follow-up and resolution.

Measureable Goal: Ongoing use of the resources to provide relevant information

Status: Met goal

Next Step: Continue to use these resources to address this requirement

2. Public Involvement and Participation

A. Permit Ref. 2.a.i. Public involvement in the development of the SWMP

2.a.i. BMP 1. Opportunities for public involvement in the development of the SWMP

During the reporting period, KC Water was updating its SWMP that was prepared prior to the issuance of the Second Permit.

Measureable Goal: Adequate opportunities for involvement

Status: NA

Next Step: Public involvement in the development of the SWMP will be scheduled in the summer of 2019

B. Permit Ref. 2.a.ii. Public participation in implementation activities

2.a.ii. BMP 1. Utilize the Department's *What's On Tap?* newsletter to disseminate educational information

During the reporting period, approximately 161,500 newsletters were mailed out each time. In addition, the content was emailed to about 39,700 accounts.

Measureable Goals: At least two stormwater-focused articles per year

Status: Met goal

Next Step: Continued use of this resource to educate and reach out to the public

2.a.ii. BMP 2. Utilize KC Water's website to provide information on stormwater management and water quality matters

During the reporting period, KC Water revamped its website including its education page (<https://www.kcwater.us/education/>). This page lists various links and resources covering teacher resources, community outreach, water quality, tours, printer materials, videos and water quality grants.

Measureable Goal: Ongoing use of the resource

Status: Met goal

Next Step: Continue to use and improve the resource

2.a.ii. BMP 3. Work cooperatively with non-governmental organizations on educating and training students on stormwater management, water quality, and water quality testing through the True Blue program and KC to the Sea curriculum

Through KC Water's Water Quality Small Grant Program, KC Water continued to work with the Blue River Watershed Association, a nonprofit, grassroots community organization that engages Kansas Citians in protecting and restoring the area's watersheds.

Community Camp. During the reporting period, a series of *Saturday Community Camps* were held with youth and adults in the Seven Oaks neighborhood. The program held 11 community

day camps that included 3 field trips. A total of 185 residents, both youth and adults, participated in the camps.

KC to the Sea. During the reporting period, KC Water taught the *KC to the Sea* curriculum at 46 schools and 1 summer camp, reaching a total of 4,267 students in 11 different school districts.

Measureable Goal: Active participation and support of efforts

Status: Met goal

Next Step: Continue the practices

2.a.ii. BMP 4. Continue to participate in the MARC WQEC

KC Water staff attended the full quarterly meetings and subcommittee meetings during the FY 18/19.

Measurable Goal: Attend monthly meetings and participate in committee work

Status: Met goal

Next Step: Continue to participate in MARC's activities

2.a.ii. BMP 5. Administer KC Water's Annual Water Quality Education Grant (WQEG) program

During the reporting period, KC Water continued to work with the organizations that received the grant in 2017. See TABLE 2 for the achievements made.

In January 2019, KC Water selected seven proposals from seven organizations to provide a total \$81,026 in grant money to support projects and activities related to water quality protection, improvement, and education. The organizations and their proposals were:

1. Stone Lion Puppet Theater; *SPLASH – 2019 KC Water Education Program*
2. Green Works in Kansas City; *Mighty Missouri SOS*
3. Bridging the Gap; *Business Outreach and Stream Clean-up Project*
4. Friends of Kaw Point Park; *Hydrocaching and Watershed Education*
5. Little Blue River WS Coalition/Healthy Rivers Partnership; *Project Blue River Rescue*
6. Little Blue River WS Coalition; *The Missouri River and Blue at the Zoo Watershed Festivals*
7. The Barstow School; *Watt's Mill Water Quality Project.*

Measurable Goal: Completion of another round of solicitation, review, and award of grants.

Status: Met goal

Next Step: KC Water will continue to administer this program.

TABLE 2. WQEG PROGRAM ACHIEVEMENT SUMMARY

Organization (Project completed during the Report Period)	Achievements
Blue River Watershed Association (Saturday Community Camps)	<ul style="list-style-type: none"> • Participants learn about water pollution and litter; then participate in stewardship activities • 11 community day camps were held, including 3 field trips • 185 residents participated in the camps
Bridging the Gap (Business Outreach and Stream Clean-up Project)	<ul style="list-style-type: none"> • Reach out to businesses about how their operations may impact water quality • Completed 6 clean-ups, recruited 84 volunteers, collected 5,000 lbs. of trash • Engaged 76 businesses in litter management education • Provided supplies for an additional 19 community cleanups held by others
Friends of Kaw Point Park (Hydrocaching and Runoff to Rivers)	<ul style="list-style-type: none"> • Updated and maintained the existing caches at 10 locations along local waterways and near constructed BMPs • Set up additional 10 caches • 558 geocachers have located the caches • Taught 14 <i>From Runoff to Rivers</i> classes in 9 local middle and high schools. Reached 336 students • 10 classes hosted litter pick-ups around their schools, collecting a combined 877 lbs. of trash
Healthy Rivers Partnership/ Little Blue River Watershed Coalition (Project Blue River Rescue)	<ul style="list-style-type: none"> • 900 volunteers participated in the April 6, 2019 event • Collected and disposed of over 25 tons of trash and 400 used tires from 17 different worksites • Removed invasive honeysuckle from 2.5 acres • Planted 500 native trees along the Blue River
Little Blue River Watershed Coalition (Blue at the Zoo)	<ul style="list-style-type: none"> • Educated scouts and their accompanying adults about the adverse impacts of stormwater runoff and water pollution • Provided hands-on learning opportunities, exhibits, and displays • April 20, 2019 (Scout Weekend) event attracted 350 visitors • 10 different booths hosted by local environmental partners
StoneLion Puppet Theatre (<i>Illuminated Waters: Shedding a light on the need for clean water</i>)	<ul style="list-style-type: none"> • Expanded environmental education through the art of puppetry • Made available 3 water-quality puppet shows: “The Little Red Hen’s Garden;” “Down the Drain;” and “Reflections” • Performed 1 of 3 shows at 18 local schools; reached 5,586 students • Held the <i>Illuminated Waters</i> festival on May 25-26, 2018, featuring 15 local environmental and art groups; reached an estimated of 7,000 attendees

3. Illicit Discharge Detection and Elimination

Permit Ref. E.3.a.i. Maintain and update a storm sewer map that includes outfalls and receiving waterbodies

Measureable Goal: Add all new outlets as established and systematically review historical system for gaps

Status: Ongoing

E.3.a.i. BMP 1.

KC Water maintains a geographical information system (GIS) database that can map all known constructed outfalls and locations of all receiving waterbodies.

The City's resources for the outfalls information include:

- a) City-wide watershed studies conducted between 1997 and 2007
- b) Levee sewer outfall inspection reports conducted prior to 2002
- c) Investigations conducted under the City's Combined Sewer Overflow Program
- d) Data for the City's wastewater sewer systems

E.3.a.i. BMP 2.

Currently KC Water does not track the number of the outfalls that were added to the existing mapping system. But as KC Water receives As-Built from various sources, newly-constructed outfalls are added to the map. In addition, KC Water may also make a correction or addition on the outfall locations if a review of archived As-Built or easement indicates any error. Such a review is usually conducted per a customer's request for information.

Next Step: Continue to maintain and update the system

Permit Ref. E.3.a.ii. A plan to prohibit illicit discharges and implement enforcement procedures and actions

Measurable Goal: To be addressed in the 2019 SWMP

Status: Ongoing

E.3.a.ii. BMP 1.

The City adopted an ordinance for Stormwater Discharge Control Regulations (Chapter 61. Article III.) in 2007. The article specifically regulates the contribution of pollutants to the stormwater drainage system by any user, prohibits illicit connections, and establishes legal authority to carry out all inspections, surveillances, monitoring and enforcement procedures necessary.

Next Step: Continue to implement the ordinance

Permit Ref. E.3.a.iii. Inspection and investigation procedures for detection and eliminating illicit discharges

Measurable Goal: 100 percent resolution of potential illegal connections and related issues

Status: Ongoing

E.3.a.iii. BMP 1

KC Water is responsible for investigating reports of illicit discharges. The investigation procedure follows the manual, Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments, developed by the Center for Watershed Protection and Robert Pitt. During the reporting period, KC Water investigated 17 incidents of suspicious illicit discharges. All were resolved

Next Step: Continue to investigate, as needed

Permit Ref. E.3.a.iv. Conduct a field screening program

Measurable Goal: Complete a minimum of 100 screenings annually

Status: Completed

E.3.a.iv. BMP 1.

KC Water had completed the field screening of the major outfalls in the watersheds north of the Missouri River in the previous years. During the reporting period, KC Water started to screen the outfalls in the watersheds south of the River and those functioning as a component of the City's separate storm sewer system. A total of 118 outfalls and 6 watersheds were screened.

The field inspector utilized the City's GIS to identify the sites for screening and followed the procedure detailed in the 2017 SWMPP.

Next Step: Continue to implement the program

Permit Ref. E.3.a.v. Procedures to minimize, contain, and respond to spills

Measurable Goal: Minimize the impact of the spill on water quality through timely and effective response

Status: Ongoing

E.3.a.v. BMP 1.

The Fire Department implements the following guidelines that address the potential impact on stormwater from a spill:

- a) HazMat Response General Operational Guideline for Fuel Spills. The Guideline encourages using dry absorption as the preferred method to clear a spill and taking measures to protect stormwater drains. It also provides direction on how to properly dispose of water and avoid discharge into storm drains if flushing is the option.
- b) HazMat response General Operational Guideline for First Responders. The Guideline requires the flush water must be confined after it has been used and then disposed of properly.

The Fire Department responded to a total of 338 incidents for fluid cleanup (331) or hazardous materials (7) during the reporting period. Hazardous material-related incidents referred to here may not necessarily be about liquid spills (e.g., chemical odors emitted from structures). Also note the total number does not include incidents that may have fluids spilled but were classified as a higher level of calls (i.e., emergency calls for injuries in vehicular accidents, etc.).

Next Step: The Fire Department will continue to implement the guidelines.

Permit Ref. E.3.a.vi. Limit infiltration of seepage from municipal sanitary sewers

Measurable Goal: To be addressed in the 2019 SWMP

Status: NA

E.3.a.vi. BMP 1.

KC Water maintains the City's sanitary sewer system through a joint effort by different divisions.

<u>Wastewater Maintenance Division</u>		<u>Engineering Division (estimated)</u>	
143	sewers televised (miles)	14.9	sewers televised/cleaned (miles)
659	sewers cleaned (miles)	3	manholes rehabilitated
2,088	public sewers repaired (feet)	33	manholes installed
5,366	private sewers repaired (feet)	33.3	sewer line rehabilitated (miles)
182	manholes repaired	407	sewer repair jobs
164	stoppages opened		

<u>Overflow Control Group (Smart Sewer Program)*</u>			
168 miles	sewers televised		
5 miles	laterals	repaired/replaced/rehabilitated	
37 miles	sewer mains	repaired/replaced/rehabilitated	
1,582	# of inlets	repaired/replaced/rehabilitated	
162 miles	sewers cleaned		

Next Step: The City will continue to implement the above programs to limit infiltration and inflow from sanitary sewers.

Permit Ref. (NA) Support efforts and programs that encourage proper management of materials or wastes

Measurable Goal: Reported quantities from various efforts and programs

Status: Ongoing

E.3. (NA) BMP 1.

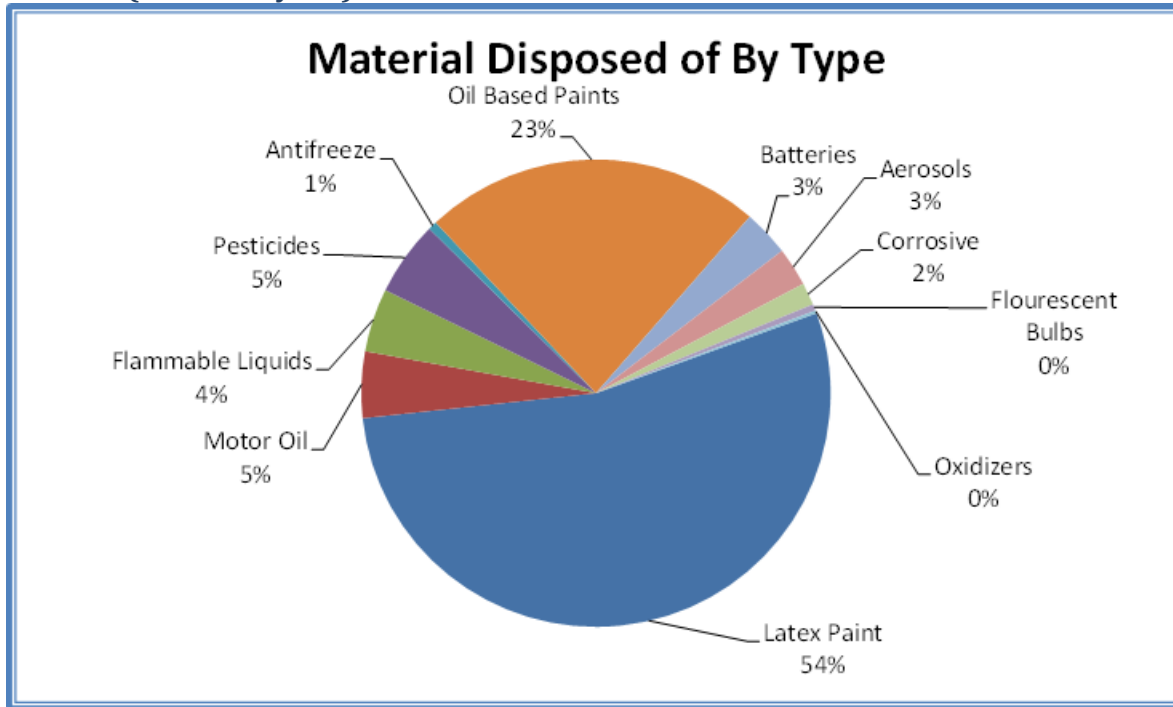
The City operated several waste management programs that encourage proper disposal, as well as preventing and addressing illegal dumping. See Table 3, Fig. 1 and Fig. 2 for details.

Next Step: Continue the existing programs

TABLE 3. Comprehensive waste management program achievements

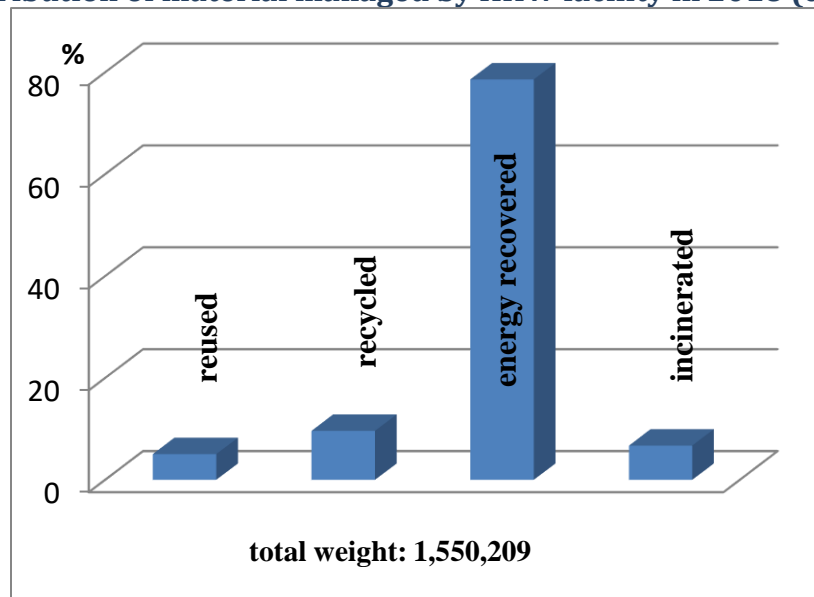
Quantity (in Tons)	Program
KC Recycles (FY 2018/19)	
537 tons	Community recycling drop-off centers
15,569 tons	Curbside recycling
Bulky Items Collection (FY 2018/19)	
6,164 tons	Bulky items
Leaves and Brush Collection (FY 2018/19)	
1,211 tons	Curbside
Illegal Dumping Cleanup (FY 2018/19)	
3,061 tons	Material collected
	19 cameras placed at 15 locations
Neighborhood Cleanup Assistance (FY 2018/19)	
124 tons	Tires collected in neighborhoods and during special events, or received at drop-off centers (# = 11,253)
Household Hazardous Waste (HHW) 2018 Calendar Year	
637 tons	HHW Facility
177 tons	Mobile Outreach
	11,374 vehicles delivering
	3,013 vehicles delivering
39 tons	Total materials reused in Swap Shop
75 tons	Total materials recycled
609 tons	Total materials sent for energy recovery
52 tons	Total materials incinerated

Fig. 1. Material by type disposed of by Household Hazardous Waste (HHW) facility in 2018 (calendar year)



- Total weight of the materials disposed of (not collected) was 1,550,209 pounds.
- Total weights are only materials that were reused, recycled, energy incinerated, and recovered.
- Percentages reflect the HHW numbers associated with Kansas City, Independence, Lee's Summit, and MARC-participating communities.

Figure 2. Distribution of material managed by HHW facility in 2018 (calendar year)



Total weight of the materials includes additional interagency materials not only associated with MARC communities.

4. Construction Site Runoff Control

Permit Ref. 4.a.i. Develop and Implement ordinances to require erosion and sediment control BMPs at construction sites

Measureable Goal: Ongoing implementation of requirements as any development occurs

Status: The measurable goal has been met.

4.a.i. BMP 1.

The City implements the City Code Chapter 63 Erosion and Sediment Control. Division 4 of this chapter is about enforcement that which includes enforcement activities, suspension or revocation of permit, action against the security, as well as fines and penalties. See the link below.

https://library.municode.com/mo/kansas_city/codes/code_of_ordinances?nodeId=COORKAMIV_OII_CH63ERSECO

Next Step: The City will continue its current practice.

Permit Ref. 4.a.ii. Requirements for control of construction site waste

Measureable Goal: To be addressed in the 2019 SWMP

Status: Completed

4.a.ii. BMP 1.

For City-funded construction projects, the City developed a template of Stormwater Pollution Prevention Plan (SWPPP) to address sediment and erosion controls. The Plan contains requirements to manage construction site-related wastes, including but limited to, solid waste, liquid waste, concrete waste (washout area), hazardous waste, etc.

4.a.ii. BMP 2.

For privately funded construction projects (≥ 1 acre), the Land Development Division (LDD) of City Planning and Development (CPD) Department requires that a concrete washout is reflected on each site disturbance plan. Requirements for other site-related construction wastes are not currently in place.

Next Step: The LDD of CPD will continue its current practices with sediment and erosion control.

Permit Ref. 4.a.iii. Requirements for review of all construction site stormwater pollution prevention plans (SWPPPs)

Measureable Goal: Review all submitted SWPPPs

Status: Ongoing

4.a.iii. BMP 1. City-funded construction projects

For City-funded construction projects, KC Water reviews each SWPPP. During the reporting period, KC Water reviewed 44 SWPPPs submitted by project managers from different City Departments.

4.a.iii. BMP 2. Privately-funded construction projects

For privately-funded construction projects (≥1 acre), the LDD of CPD Department only inspects the approved site disturbance plan and does not maintain a copy of the SWPPP for any permit.

Next Step: The City will continue its current practices

Permit Ref. 4.a.iv. Procedures to receive and respond to public reporting of the discharge of pollutants

Measureable Goal: To be addressed in the 2019 SWMP

Status: NA

4.a.iv. BMP 1. City's 311 System for Centralized Reporting

The City has a centralized 311 system to provide residents with multiple venues to access City services, including addressing illicit discharges from construction sites. Once the report is logged into the system, the appropriate department or division will be assigned to investigate the issue. Once the issue is resolved, the department or division will close the issue in the system. The public can check online about the status of their report or they can request to receive an email notification. See E.1.a.IV. BMP 1. for details.

Next Step: The City will continue to use the system to address all public reporting.

Permit Ref. 4.a.v. Procedures for inspection and enforcement

Measureable Goals

For City-funded projects, KC Water provides monthly oversight inspections for active sites. For privately-funded projects, the LDD of CPD provides for a minimum of two inspections; additional inspections are as needed, depending on the scope and scale of the project.

Status: Ongoing

4.a.v. BMP 1. City-funded projects.

Inspection starts the month that KC Water receives the notice of the project and related Stormwater Pollution Prevention Plan sent by a project manager. The inspection ends the month after KC Water is notified the project is 100 percent completed. The inspector uses an Erosion & Sediment Control Report form to document the process.

If there is any issue identified during the inspection, the inspector sends notification to the relevant project manager, who subsequently will inform the contracted construction manager. If the issue does not get resolved within a reasonable timeframe, the project manager can withhold the payment to the contractor until the issue is resolved.

During the reporting period, KC Water conducted 273 inspections. Issues identified during the inspection were all resolved in time.

4.a.v. BMP 2. For privately-funded projects (>1 acre)

The LDD of CPD conducts biweekly inspections on sites with active permits. More than 1,547 inspections were conducted during the reporting period.

4.a.v. BMP 3: For privately-funded projects (< 1 acre)

The Division of Inspections with CPD conducts investigations and enforces the ordinance. During the reporting period, the Division conducted 130 investigations, sent out 40 notices of violation, wrote 10 tickets, and issued 1 stop work order.

Next Step: The City will continue its current practices.

Permit Ref. 4.a.vi. A plan to ensure compliance with the erosion and sediment control ordinance

Measureable Goal: To be addressed in the 2019 SWMP

Status: Ongoing

4.a.vi. BMP 1. City-funded projects

The department that manages the construction work is responsible for the compliance with the erosion and sediment control ordinance. KC Water provides regular inspections to ensure the compliance.

4.a.vi. BMP 2. Privately-funded projects

CPD is responsible for compliance with the ordinance that outlines the enforcement options.

Next Step: The City will continue the practice.

Permit Ref. 4.a.vii. Education and training measures for site operators

Measureable Goal: Continue the established training procedures

Status: Ongoing

4.1.vii. BMP 1

A City employee earned the *Qualified Compliance Inspector of Stormwater* online recertification provided through [Stormwaterone.com](https://stormwaterone.com).

4.1.vii. BMP 2.

Seven inspectors and plan reviewers with the LLD of CPD received in-house training from a fellow employee, who is a certified inspector of sediment and erosion control.

4.1.vii. BMP 3

In addition to the seven above-referenced staff inspectors and plan reviewers, seven new hire inspectors with the Division of Inspections of CP&D received in-house training based on the Department's Erosion and Sedimentation Control Requirements in its information bulletin No. 128 (version 2012).

Next Step: The City will continue to provide its employees with training on this topic.

5. Post-Construction Stormwater Management in New Development and Redevelopment

Permit Ref. 5.a.i. Develop ordinances to address post-construction runoff from the new development and redevelopment projects

Measureable Goal: Ongoing implementation of the requirements during development reviews

Status: The measureable goal was met

5.a.i. BMP 1

The City enacted a revised Zoning and Development code in 2009. The revised version promotes more open space and greater natural resource protection by incorporating the Stream Buffer Regulations and Conservation and Open Space Development Regulations. No significant stormwater-related changes have been made since.

5.a.i. BMP 2

The LDD of CPD continued to require developments' adherence to the adopted APWA Standards and Supplements that include the Manual of Best Management Practices for Stormwater Quality and compliance with stream buffer regulations during the initial planning stages of new development/redevelopment, as well as during the construction of the projects. These standards require developments to mitigate their impacts for post-construction above predevelopment conditions by including permanent water quality BMPs, stream buffers, and maintenance instruments for all sites within the MS4. In addition, KC Water also provides BMPs guidance during the plan review and approval process.

5.a.i. BMP 3

Multiple City departments worked together to update the APWA 5600 Standard (*Storm Drainage Systems & Facilities*) and APWA 2600 Standard (*Storm Sewers*). A draft was prepared for further review and adoption.

Next Step: The City will continue to review the updated APWA 5600 and 2600 draft standards and work on adopting the updated version.

Permit Ref. 5.a.ii. Develop a plan to ensure adequate long-term operation and maintenance of selected BMPs

Measureable Goal: Utilize the established maintenance protocols

Status: Plan in place

5.a.ii. BMP 1

For new development or redevelopment-related BMPs, CP&D continues to use three covenants applicable to stormwater BMP maintenance scenarios: *Stormwater Detention Covenant for Maintenance*; *Stormwater Detention & BMP Covenant for Maintenance*; and *Conveyance of Easement for BMPs*. These documents are intended to require developers or property owners to take responsibility for maintenance, repair, and restoration of detention basins or BMP structures.

5.a.ii. BMP 2

For projects built under the Overflow Control Program, the BMPs are generally maintained for the first three years by the contractors that build the projects, and then they are subsequently maintained by the KC Water Green Solutions crew. There are also a couple of exceptions, such as the currently under-construction BMPs on Veterans Administration property and Kansas City Public Schools property. Agreements are in place for the property owners to take over the maintenance responsibility after the initial three-year maintenance provided by the construction contractors who build them.

5.a.ii. BMP 3

For BMPs built through other stormwater projects (e.g., funded by Public Improvement Advisory Committee), the KC Water Green Solutions crew is responsible for maintenance.

Next Step: The City will continue to conduct maintenance as described above.

Permit Ref. 5.a.iii. Strategies to minimize water quality impacts, minimize stormwater pollution, and/or utilize BMPs

Measureable Goal: To be addressed in the 2019 SWMP

Status: Ongoing

5.a.iii. BMP 1.

The CPD requires macro/micro stormwater drainage study for a development. A developer must submit a stormwater drainage study for a plat application as required by the City Code Chapter 66, Section 43 Preliminary plat and Section 45 Review of final plat by City Council. A general stormwater management plan must be submitted for the entire development when the preliminary plat is submitted. The plan must depict the concept for stormwater detention, BMPs, volume controls, or treatment areas as appropriate. A macro/micro drainage study must be submitted for the entire development when the first plat is submitted; a detailed micro drainage study must be submitted for approval before the issuance of any building permits; a macro storm drainage study for the entire development must be submitted with a micro stormwater drainage study for each phase during final platting. Refer to Permit Ref. 5.a.i for required adherence to Stream Buffer Ordinance and BMP manual.

5.a.iii. BMP 2.

On August 21, 2008, the Kansas City, Missouri City Council adopted a stream setback ordinance and a companion conservation development ordinance. The ordinances are intended to protect life and property and promote healthy stream corridors while providing flexibility and development options in stream corridors and City-wide. The stream setback and conservation development ordinances became effective on February 14, 2009 and apply to new development, redevelopment, and construction and infrastructure projects near streams.

Stream setbacks are based on the stream's actual characteristics, including the 100-year floodplain or flood conveyance; adjacent steep slopes (greater than 15 percent grades) and mature, native vegetation (such as woodlands). Three zones are specified, with more restrictions closer to the stream. For details, see the 2009 MS4 report.

Currently, the City does not have a requirement for preservation of undisturbed natural areas, trees, and steep slope, except for those specified in the Stream Buffer Ordinance.

5.a.iii. BMP 3.

City Ordinance Chapter 28 addresses Floodplain Management. In Article IV. Provisions for Flood Hazard Reduction Sec. 28-51., general standards are set for:

- 1) Storage, material, and equipment. Specifically, the storage or processing of materials within the special flood hazard area that are in time of flooding buoyant, flammable, explosive, or could be injurious to human, animal, or plant life is prohibited
- 2) Hazardous materials. All hazardous material storage and handling sites shall be located out of the floodplain.

5.a.iii. BMP 4.

KC Water has been working on the Green Stormwater Infrastructure Manual, which is intended to guide the developments of future of stormwater management infrastructure. The manual will provide the tools, design guidelines, and detail construction specifications, as well as establishment and maintenance procedures for green infrastructures.

Next Step: The City will continue to implement the current ordinance and policies. KC Water will complete the Green Stormwater Infrastructure Manual within the next permit year and will seek council approval to adopt the manual City-wide.

Permit Ref. E5.a.iv. Inspect post-construction BMPs for proper functions

Measureable Goal: All facilities inspected prior to occupancy; inspect one-fifth of private stormwater facilities annually

Status: The measurable goals were met.

5.a.iv. BMP 1.

During the reporting period, KC Water inspected 20 stormwater detention/retention basins. There are 99 basins on the inspection list.

Next Step: KC Water will continue to inspect the private stormwater detention/retention basins

6. Pollution Prevention and Good Housekeeping for Municipal Operations

Permit Ref. 6.a.i. An employee training program to prevent or reduce stormwater pollution

Measureable Goal: To be addressed in the 2019 SWMP

Status: Ongoing

6.a.i. BMP 1.

For employee training related to land disturbance, refer to [Section 4. Construction Site Stormwater Runoff Control](#)

6.a.i. BMP 2.

For the staff who maintain the City's fueling stations or service the fleets, supervisors conduct daily housekeeping reviews with them. In addition, staff is required to have annual HazMat (Level-1) and Spill Prevention, Control, and Countermeasure training.

6.a.i. BMP 3.

The City uses three DVDs for stormwater pollution prevention education for employees regarding municipal operations. Each is designed for stormwater pollution prevention by Excal Visual for employees working outdoors with materials or wastes that could potentially lead to pollution. The titles are: *Stormwatch; A Drop in the Bucket; Rain Check*.

Next Step: The City will continue to provide training and education to its employees based on their job responsibilities.

Permit Ref. 6.a.ii. Maintenance of BMPs...for structural controls to reduce floatables and other pollutants in discharges from the MS4

Measureable Goal: Continue the established protocols

Status: Ongoing

6.a.ii. BMP 1.

KC Water continues to maintain City-owned Green Stormwater Infrastructure, allowing them to function at an optimal level. Currently, KC Water maintains a total footprint of 28 acres of Green Stormwater Infrastructure that includes but is not limited to rain gardens, bioretention cells, detention basins, and permeable pavements.

Next Step: The City will continue to conduct inspections.

6.a.ii. BMP 2.

The Stormwater Maintenance group inspected and maintained the public detention basins at 6013 North Strathbury Road, 300 Chestnut Trafficway, 3913 North Kensington Road, Stillwell Avenue, Gardner Avenue (now a retention basin), and 81st and Troost. The City owns and the City's Board of Police Commissioners maintains multiple detention basins at several police

department patrol stations that include Central, Metro, South, East Patrol, and Shoal Creek stations.

Next Step: The City will continue to conduct inspections as described above.

6.a.ii. BMP 3.

KC Water continues to administer the Detention Basin Credit program to encourage the use of detention/retention basins. Routine inspections were conducted to the listed basins and owners of the properties can receive the credit in their monthly stormwater bills. During the reporting period, KC Water inspected 20 basins.

Next Step: The City will continue to conduct inspections as described above.

Permit Ref. 6.a.iii.1. Management of deicing chemicals

Measureable Goals: Amount of deicing materials used annually

Status: Ongoing monitoring of usage

6.a.iii. BMP 1.

The City's Public Works Department (PWD) has deicing chemical and material storage facilities at each of its three districts and two outlying salt storage facilities. The facilities vary in size, and their storage capacities range from 6,000-12,000 tons of materials. Rock salt is stored in dome structures at three locations. The domes were constructed on asphalt slabs and consist of wooden and concrete structural materials, capable of containing deicing chemicals during periods of extended storage. The two additional salt storage facilities are **Cover-All** buildings with ten-foot high concrete walls constructed on an asphalt slab. Salt brine and calcium chloride solutions are also used as deicing agents for the public streets, and both are stored in tanks. During the reporting period, the City used a total of 200,000 gallons of salt brine, 9,000 gallons of liquid calcium chloride, and 29,151 tons of salt to keep the City streets safe for cars and passengers.

Next Step: PWD is in the process of replacing one dome with a **Cover-All** building.

6.a.iii. BMP 2.

The City's General Services Department, which manages about 160 City sites, used deicing material mostly sourced from PWD (the amount was included in the above 6.a.iii. BMP 1.). In addition, it applied a total of two tons of ice-melt, sourced from a retail vendor, on the sidewalks of the buildings for pedestrians' safety.

Next Step: The department will continue the practice to ensure pedestrians' safety.

Permit Ref. 6.a.iii.2. Street sweepings

Measureable Goals: Sweep entire City according to schedule (approx. 20,000 curb miles annually); three seasonal collections per year (two in the fall, one in the spring).

Status: The measurable goals have been met for the reporting period.

6.a.iii.2. BMP 1.

The City uses Elgin Eagles for street sweeping. A total of 10,172 miles of streets were swept with a collection of 1,250 tons of sweepings.

6.a.iii.2. BMP 2.

The City collected 4,624 tons of leaf and brush through three cycles of curbside collection during FY 18/19.

Permit Ref. 6.a.iii.3. Street design/construction/maintenance practices that reduce discharge of pollutants to the MS4

Measureable Goals: Continue to apply the established standards

Status: NA

6.a.iii.3. BMP 1.

For street design, construction and maintenance, the City follows the Kansas City Metropolitan Chapter of the APWA standards with the supplements. See <http://kcmo.gov/publicworks/design-construction-standards/>

Permit Ref. 6.a.iii.4. Routinely clean stormwater inlets

Measureable Goals: Complete 15,000 cleanings per year

Status: The measurable goal has been met.

6.a.iii.4. BMP 1.

KC Water inspected and cleaned 19,598 stormwater inlets that included 1,307 inlets cleaned through 311 service requests. In addition, KC Water also repaired 345 stormwater inlets.

Next Step: KC Water will continue to maintain the stormwater inlets.

Permit Ref. 6.a.iv. Storage of paints, solvents, petroleum products and waste not to be exposed; sufficient practices of spill prevention, control, and/or management; containment system material to be compatible with the content and minimizing the contamination of groundwater

Measureable Goals: Will be addressed in the 2019 SWMP

Status: Ongoing

6.a.iv. BMP 1.

The City implements the Environmental Management System (EMS) as a good environmental stewardship into all of its organizational activities. Chapter 5. Chemical Management specifically

addresses management of chemicals, including storage of paints, solvents, petroleum-related products. For example:

Section 5.03.02.a.7: *Storage Surface.* Containers storing hazardous substances should be stored on an impermeable surface with no cracks, drains, or sumps nearby that would allow a spill to escape.

Section 5.03.02.c.4: *Protection From the Elements.* Storage areas should be shielded from exposure to the elements. A protective covering that prevents snow, rain, direct sunlight, etc., from compromising the integrity of the storage containers is recommended.

6.a.iv. BMP 2.

EMS Chapter 6 Waste Management, addresses specific requirements for latex paint, used oil contaminated materials, as well as used oil.

6.a.iv. BMP 3.

EMS Chapter 5 Section 04 addresses tank management. Regarding spill prevention, Section 5.04.02.a. specifically states for Portable Tanks' Condition, all portable tanks should be in "good" condition. This means that the container should not be rusted, have structural defects, or leak. If any of these conditions exist, the hazardous substance should be transferred to a portable tank in good condition and any contamination should be cleaned up. Section 5.04.04.c.3. for petroleum Tank Requirements, Spills and Overfill Prevention states, both new and existing tanks must be equipped with catchment basins and one of the following (unless the underground storage tank [UST] never receives more than 25 gallons at one time): Automatic shutoff devices; Overfill alarms; Ball float valves.

In addition, Chapter 5 Section 05 addresses spill prevention, control and countermeasures (SPCC). It details conditions requiring SPCC, SPCC plan specifications, chemical use, and transportation guidelines.

Chapter 7 addresses spill prevention and response. It specifies job training and provides clear performance direction.

6.a.iv. BMP 4.

Chapter 5 Section 04 addresses tank management. Regarding containment system material, Section 5.04.02.d. states: Portable Tanks should be made of, or lined with, a material that will not react with the substance being stored. Section 5.04.03.a. states (for aboveground and on-ground storage tanks) tanks shall be designed and built in accordance with recognized good engineering standards for the material of construction being used. The tank construction material shall be compatible with the liquid to be stored. For specific guidance on design and installation specifications refer to NFPA Code 30.

6.a.iv. BMP 5.

Chapter 5 Section 04 addresses tank management. Regarding minimizing the contamination of groundwater, Section 5.04.04.e Leak Detection states: All USTs must meet the federal leak detection requirements. The EPA has identified leak detection methods that UST owners and operators can use to meet the federal requirements for detecting leaks from portions of both tanks and piping that routinely contain products.

6.a.iv. BMP 6.

The City's Office of Environmental Quality (OEQ) conducted annual inspections at 348 sites that are either owned or operated by the City. The inspection was done in compliance with the EMS and tracked in the Archibus Environmental and Risk Management System (AE&RMS). An automated report is generated on monthly a basis to provide a summary of environmental compliance recommendations for each department.

Next step: The City continues using and following the AE&RMS and EMS, respectively

Permit Ref. 6.a.v. A plan to reduce pollutants related to pesticides, herbicides, and fertilizers (PHFs), by using appropriate measures

Measureable Goals: To be addressed in the 2019 SWMP

Status: Ongoing

6.a.v. BMP 1.

There are multiple chapters in the City's EMS that address the application of pesticides, herbicides, or fertilizers (PHFs). Section 2.05.01 states that pesticides, used throughout City facilities and its landscapes, are regulated by the Missouri Department of Agriculture that certifies commercial, noncommercial, and public pesticide applicators.

Section 5.07.06 specifies persons engaged to apply pesticides for commercial, noncommercial, private, and public entities are certified. It states that City departments that apply or utilize the services of those who apply PHFs should put into place BMPs to reduce their run-off before and after the products have been applied.

Section 9.03.03 lists chemicals that are not allowed in the storm water system. The list includes pesticides.

6.1.v. BMP 2.

The City's General Services Department, which manages about 160 City sites, does not use PHFs to maintain lawn or other landscape.

6.1.v. BMP 3.

P&R crews maintain over 40 miles of park roads, hundreds of parking lots, 2,008-acres and 135 miles of boulevards, parkways, and streets. Except in the effort to save the healthiest Ash trees from the Emerald Ash Borer, the department does not use pesticides in these rights-of-ways. Herbicides and fertilizers are used sparingly and only as needed on specific areas which require a higher level of maintenance.

6.1.v. BMP 4.

P&R crews continue to maintain, improve, and protect thousands of acres of land that provide wildlife habitat and contribute to reducing stormwater runoff and water pollution throughout the City. These properties include:

- a) >6,500 acres protected as woodlands throughout the parks system
- b) >150 acres in the reduced mowing program
- c) >290 acres of natural areas on 36 sites, consisting of restored and remnant prairies, glades, butterfly gardens, bio-swales, and rain gardens

6.1.v. BMP 5.

P&R crews continue to use environmental BMPs and procedures for its five golf courses: Hodge Park, Shoal Creek, Swope Memorial, Minor Park, and Heart of America. The contracted management teams from Kemper Sports and Orion Management Solutions continue to reduce pesticide and fertilizer usage at the above courses by:

- a) Maintaining a native buffer near water bodies and sensitive areas wherever possible
- b) Allowing the outer rough areas that were once mowed and irrigated at each course to return to their native habitats (approximately 15 to 20 acres)

In addition, Shoal Creek Golf Course is designated as a *Certified Audubon Sanctuary* through the International Audubon Cooperative Sanctuary Program for golf courses. This ecologically-based program promotes both responsible land management and conservation of natural resources.

6.1.v. BMP 6.

For the approximately 28 acres of BMP sites that KC Water maintains, staff or contractors are required to have a Missouri Pesticide Applicator License. For P&R's property maintenance, the Department requires its general supervisors, landscape technicians, and one of its Conservation Corps maintenance workers to have Pesticide/Herbicide Applicator licenses.

Next Step: The City will continue the current practices regarding pesticide, herbicide, and fungicide management.

7. Industrial and High Risk Runoff

Permit Ref. 7.a.i. Identify facilities that discharge into the MS4

Measureable Goal: Review list and add or remove facilities, as warranted

Status: The measurable goal was met.

7.a.i. BMP 1. Municipal landfills

The 87th Street solid waste dump site remains on the list. The City ceased operations of solid waste dump sites in 1974. These closed sites were operated by the City during various periods from 1950 to 1974. The 87th Street site is within the boundary of the MS4-served area and is thus subject to the MS4 permit. This site has been closed from dumping since 1972 and is currently the site of a City Wastewater Pumping Station. The OEQ, in consultation with several departments, continues to monitor this inactive dump site for compliance with the MS4 Permit and in general for issues that may pose a threat to public health or safety, threaten environmental protection, or that may create a nuisance condition.

The OEQ performed periodic walk-through inspections for 87th Street site. Visual observations during the inspection include evaluations for: (1) cap integrity and vegetative cover; (2) water ponding on the cap surface of the site; (3) fill material exposure; and (4) evaluate continued active seepage present at this site. The inspection results are documented and further investigations undertaken if warranted.

The OEQ established a maintenance program for the City's dump sites. All maintenance activities are geared toward maintaining the integrity of the landfill cap and minimizing the infiltration of water into the interred waste. The program may include surface waste removal and cap maintenance.

Next Step: The OEQ will continue periodic landfill inspections, consider remedial options and determine a course of action (if necessary), and implement the maintenance plans based on the results of the inspections.

7.a.i. BMP 2. Hazardous waste treatment, storage, and disposal (TSD) facilities; Title III Section 313 facilities; other facilities that contribute a substantial loading of pollutants to the MS4

During the reporting period, four TSD facilities, seven Title III Section 313 facilities, and two other facilities were added to the inventory. Seven facilities were removed from the inventory, either due to the closure of the business, relocation, or the decreased risk of stormwater contamination.

Next Step: KC Water will continue to update the inventory as needed.

Permit Ref. 7.a.ii. Inspections and enforcement control measures

Measureable Goal: Complete a minimum of 30 inspections per year.

Status: Met goal

7.a.ii. BMP 1.

KC Water inspected a total of 54 sites. The inspected sites included 21 municipally-operated sites, 29 private industrial sites, and 4 commercial sites. Inspection priority was given to the facilities depending on:

1. Time since last inspection
2. A history of stormwater issues
3. The nature of the industrial operation

Next Step: KC Water will continue to evaluate the inventory for inspection priority and conduct the inspection based on the evaluation result.

Permit Ref. 7.a.iii. Monitoring

Measureable Goal: Annual review of all self-assessment reporting

Status: Met goal

7.a.iii. BMP 1. KC Water continues to collect monitoring data from the facilities that hold state permits, and they continue to conduct monitoring at the previously selected industrial area that is located south of Worlds of Fun. In addition, another industrial area that is near the intersection of Front Street and Universal Avenue, was added to the monitoring list. (TABLE 4).

KC Water continues to implement the Stormwater Self-assessment Program at 19 participating facilities.

Status: Ongoing

7.a.iii BMP 2.

KC Water continued to implement the Stormwater Self-assessment Program. The program was created in 2008 with the intent to help high-risk industrial operations to take preventive measures, improve housekeeping practices, and utilize BMPs to minimize stormwater pollution. KC Water continued to implement the Stormwater Self-assessment Program at 19 participating facilities.

Next Step: KC Water will continue to implement the Stormwater Self-assessment Program.

7.a.iii BMP 3.

During the reporting period, KC Water was able to collect one round of samples at both selected locations. The data results are in TABLE 5. All of the results, except lead concentrations in both samples, were within the ranges of the levels shown for the stormwater runoff in local urban areas.

Next Step: KC Water will continue monitoring.

TABLE 4. Stormwater runoff monitoring data at selected industrial areas

Location (land use in drainage area)	Sample collection date	Parameter (unit)										
		pH (SU)	Cond (µs/cm)	BOD (mg/L)	COD (mg/L)	O&G (mg/L)	<i>E. coli.</i> (MPN/100mL)	TSS (mg/L)	NO2+NO3 (mg/L)	TKN (mg/L)	Diss-P (mg/L)	TP (mg/L)
		Detection limit										
		NA	2.97	2	6.25	1.4	1	1	0.027	0.283	0.016	0.016
		Result										
SE 59th Terr. & Sterling Ave. (residential)	8/14/2018	7.97	318	12 ^a	63	1.9 ^f	17,329	31 ^a	0.759 ^f	1.9	0.23	0.33
	10/5/2018	9.01	404	7	35	ND	2,613	5 ^a	>0.213	0.9	0.12	0.15
	2/11/2019	8.06	1,117	10 ^{a,b}	122	3	6,300	110 ^a	>0.81 ^{e,h}	5	0.08 ^f	0.32
W. 135th St & Wyandotte St. (industrial)	1/11/2019	8.26	136	4	49	1.6 ^f	10	50	>0.163	1.7	0.06 ^f	0.09 ^f
	3/9/2019	8.23	898	7	78 ^e	1.7 ^{e,h}	740	170	>0.51 ^{e,h}	1.3	0.16	0.39
	4/29/2019	9.26	48.3	8 ^a	71	2.2	84	37 ^a	0.647 ^f	2.4	0.29	0.32
NW 107th Terr. & Pomona Ave. (industrial)	5/1/2018	8.01	1,610	22	134	2.4	9,208	52	1.314 ^f	2.5	0.352	0.483
	5/11/2018	7.72	1,149	14 ^{a,d}	100 ^d	2	22,800	35 ^{a,d}	1.58 ^{d,f}	1.4 ^d	0.26 ^d	0.29 ^d
	6/12/2018	7.82	543	7 ^{a,b}	77	ND	24,196	43 ^a	0.855 ^f	2	0.11	0.21
	8/7/2018	7.96	245	5 ^{a,d}	44 ^d	2.4	10,462	31 ^{a,d}	0.615 ^{d,f}	0.87 ^d	0.31 ^d	0.13 ^d
	1/11/2019	8.34	492	4 ^a	30	2.2	6,867	45 ^a	>0.498	1.9	0.03 ^f	0.08 ^f
	3/12/2019	8.6	626	4 ^a	74	2	1,553	110	>0.64 ^{e,h}	0.9	0.1	0.22
NE 51st Terr. & N. Michigan Ave. (residential)	5/1/2018	7.76	822	32 ^{a, c,d}	420 ^d	1.8 ^f	57,100	110 ^{a,d}	0.548 ^{d,f}	2.5 ^d	0.382 ^d	0.724 ^d
	5/11/2018	7.69	692	38 ^d	176 ^d	ND	54,600	97 ^d	0.659 ^{d,f}	3.7 ^d	0.39 ^d	0.73 ^d
	7/18/2018	8.25	57.7	10 ^a	60	23.2	9,804	56 ^a	1.214 ^f	1.9 ^e	0.29	0.48
	1/22/2019	7.94	21	9 ^{a,b}	28	3.9	2,413	54	>0.44 ^f	2.28	0.1	0.22
	3/12/2019	7.96	436	6	89 ^e	2.1 ^{e,f,h}	364	120 ^a	>0.44 ^f	2.7	0.23	0.41
	4/18/2019	8.04	185	29 ^a	119	1.6 ^f	7,270	250	0.475 ^f	22.1	0.38	0.78
W. 133 rd St & Inverness Dr. (commercial)	8/14/2018	8.01	118	4	28	ND	2,909	11	0.61 ^f	1.1	0.1	0.1
	12/1/2018	8.92	98	6 ^a	52	ND	75	99 ^a	0.294 ^f	2.2	0.062 ^f	0.124
	1/11/2019	8.22	295	9	38	4.5	20	53	>0.285	2.1	0.07 ^f	0.1
	2/11/2019	9.2	600	5	102	12.3	31	140	ND	0.97 ^e	0.04 ^f	0.21

Location (land use in drainage area)	Sample collection date	Parameter (unit)										
		pH (SU)	Cond (µs/cm)	BOD (mg/L)	COD (mg/L)	O&G (mg/L)	<i>E. coli.</i> (MPN/100mL)	TSS (mg/L)	NO2+NO3 (mg/L)	TKN (mg/L)	Diss-P (mg/L)	TP (mg/L)
		Detection limit										
		NA	2.97	2	6.25	1.4	1	1	0.027	0.283	0.016	0.016
		Result										
NW Barry Rd. & NW Barrybroke Dr. (commercial)	8/7/2018	7.83	264	15 ^d	71 ^d	1.8 ^f	8,664	15 ^d	>0.223 ^d	0.78 ^d	ND	0.11 ^d
	1/11/2019	8.43	500	20	124	3.8	420	130	>0.284 ^f	2.1	0.04 ^f	0.23
	2/23/2019	8.71	3.6	14 ^a	165	18.6	20	420 ^a	ND ^{e,h}	7.4	0.098 ^f	0.68
	4/18/2019	8.44	454	19 ^d	63 ^d	2.2	160	45 ^{a,d}	0.323 ^{d,f}	21.5 ^d	012 ^d	0.17 ^d

ABBREVIATIONS

Cond-conductivity

BOD-biochemical oxygen demand

COD-chemical oxygen demand

O&G-oil & grease

TSS-total suspended solids

NO2+NO3 -nitrate and nitrite

TKN-total Kjeldahl nitrogen

Diss-P - phosphorus, dissolved;

TP-phosphorus, total

^aValue is average of two or more analysis

^bdilution water blank exceeds 0.20 mg/L

^cQC data outside limits, estimated value

^dCompostie sampler missed some programmed aliquots

^eAnalyzed by contract laboratory

^fEstimated value, value may not be accurate

^gEstimated value, analyte outside calibration range

^hhold time exceeded

TABLE 5. Data summary of stormwater monitoring at the selected industrial areas

Parameter	Unit	Reporting Limit	Method Detection Limit	Commerce-3-28-2019	HWY210-3-28-2019	Average	Range of stormwater runoff*
Conductivity	us/cm	NA	2.97	30	46	38	NA
pH	SU	0	0	8.3	8.7	8.5	NA
Turbidity	NTU	0.01	0.01	27	27	27	NA
Alkalinity	mg/L	0	0	34	37	36	32-177
Biochemical Oxygen Demand (BOD)	mg/L	2	2	5	8 ^a	7	3-21
Chemical Oxygen Demand (COD)	mg/L	7	6.25	45	94	70	7-803
Total Hardness	mg/L	2	2	391	219	305	27-580
Ammonia	mg/L	0.2	0.13	ND	ND	NA	<0.13-4.72
Total Oil and Grease	mg/L	2	1.4	1.4 ^b	6.1	3.6	<1.4-24
Total Phenols	mg/L	0.01	0.002	0.056	0.051	0.054	<0.002-0.56
Total Dissolved Solids (TDS)	mg/L	1	1	230	190	210	22-4,940
Total Solids (TS)	mg/L	1	1	250 ^a	340	295	160-1,800
Total Suspended Solids (TSS)	mg/L	1	1	24 ^a	140	82	8-879
Volatile Suspended Solids (VSS)	%	1	1	19 ^a	18	19	NA
Silver, dissolved	mg/L	0.005	0.000744	ND	ND	NA	<0.0007-0.0053
Aluminum, dissolved	mg/L	0.025	0.000816	0.051	0.052	0.052	NA
Cadmium, dissolved	mg/L	0.002	0.00011	ND	ND	NA	<0.00011-0.078
Chromium, dissolved	mg/L	0.002	0.00026	0.001 ^b	0.001 ^b	0.001	<0.00026-0.02
Copper, dissolved	mg/L	0.002	0.00053	0.003	0.005	0.004	<0.00053-0.025
Nickel, dissolved	mg/L	0.002	0.0004	ND	0.001 ^b	NA	<0.0004-0.019
Lead, dissolved	mg/L	0.002	0.00214	ND	ND	NA	<0.00214-0.064
Zinc, dissolved	mg/L	0.002	0.00016	0.015	0.009	0.012	<0.00016-0.272
Silver	mg/L	0.005	0.000744	ND	ND	NA	NA
Aluminum	mg/L	0.015	0.00136	0.661	2.94	1.80	NA
Arsenic	mg/L	0.005	0.00166	0.006	0.01	0.01	NA
Cadmium	mg/L	0.002	0.00011	ND	0.001 ^b	NA	<0.00011-0.136
Chromium	mg/L	0.002	0.00026	0.002	0.008	0.050	<0.00026-0.110
Copper	mg/L	0.002	0.00053	0.005	0.022	0.014	0.00053-0.035
Iron	mg/L	0.002	0.00029	0.624	3.77	2.20	NA
Magnesium	mg/L	0.15	0.0295	1.64	2.98	2.31	NA
Manganese	mg/L	0.002	0.00008	0.023	0.177	0.100	NA
Molybdenum	mg/L	0.002	0.00057	ND	0.003	NA	NA

Parameter	Unit	Reporting Limit	Method Detection Limit	Commerce-3-28-2019	HWY210-3-28-2019	Average	Range of stormwater runoff*
Nickel	mg/L	0.002	0.0004	0.001 ^b	0.006	0.004	<0.0004-0.018
Lead	mg/L	0.002	0.00214	0.002	0.024	0.013	<0.00214-0.12
Zinc	mg/L	0.002	0.00016	0.061	0.153	0.107	0.01-0.473
Mercury	mg/L	0.0002	0.000025	ND	ND	NA	<0.000025-0.0002

*The ranges listed here were extracted from the ranges found for the stormwater runoff samples collected from representative residential, industrial, and commercial areas in the City from year 2005 to year 2015 per Part VI. Monitoring and Reporting Require

^aValue is average of two or more analysis

^bEstimated value, value may not be accurate

Permit Ref. 7.b. A list of municipal operations that need pollution prevention and good housekeeping

Measureable Goal: Maintain the existing inventory of facilities

Status: Ongoing

7.b. BMP 1.

The inventory of the industrial and high-risk runoff facility includes a list of 72 municipal operations. Of those 8 carry State NPDES permits, 29 sites have the City's Stormwater No-exposure Certificates, and 7 operations continue to implement the Stormwater Self-assessment Program.

Pollution prevention and good housekeeping measures will continue to be monitored at the remaining 35 sites. KC Water created a Stormwater Self-assessment Program in 2008. The program requires City facilities to establish good housekeeping measures and take steps to prevent pollution. MS4 staff continues to work with all City facilities on pollution prevention and good housekeeping measures.

Next Step: KC Water will update the list as needed.

8. Flood Control Projects and Devices

Permit Ref. 8.a. Develop and implement procedures to assess the impacts on water quality in the design of all new flood control projects

Measureable Goal: Continue the established procedures

Status: Ongoing

8.a. BMP 1

All the flood control projects in which the City is involved are collaborative efforts with U.S. Army Corps of Engineers (USACE). It is responsible for project design with an Environmental Assessment and/or an Environmental Impact Statement(s). The Stormwater Engineering Division of KC Water reviews the designs and provides input. The impact on water quality is one of the key elements considered in the review process.

Next Step: The City will continue the current practices.

8.a. BMP 2.

During the reporting period, Dodson Flood Damage Reduction Project was in its Phase V. This phase included constructing the tie-in levee to connect the Boone Creek Levee to the existing Bannister Levee. It also included constructing the earthen levee from Prospect Avenue to the previously constructed flood wall (Phase I) near 85th Street and Bruce R. Watkins Drive.

The borrow area located on the riverside of the levee was designed and constructed to maintain the water quality of the Blue River. The borrow area was at least 30-feet from the riverward toe of the levee. Hard points were on the levee side of the borrow areas to prevent erosion toward the levee during high flows. After levee construction was complete, the borrow area will become part of a required wetland mitigation plan that requires connecting the borrow area to the River and selectively vegetating the site with appropriate wetland and upland plant species. Slopes greater than 20 percent will be hydroseeded to minimize erosion. Grasses in the mitigation areas will not be fertilized. The other borrow area located on the land side of the levee will also be planted with native grasses and managed in a similar environmentally responsible manner.

Another feature of the project is the levee stone slope protection. It is included on the riverside of the levee to prevent or minimize erosion of the levee slope during rain or high river events. Stone slope protection will also be included for the gate structure, outfall channels and storm flow channels with the potential for high velocity flows which could cause erosion.

Next Step: The project is slated to be completed in 2020.

Permit Ref. 8.b. Develop and implement an evaluation procedure for retrofitting existing flood control devices to reduce stormwater pollutants

Measureable Goal: Continue the established procedures

Status: NA

8.b. BMP 1.

KC Water entered into an agreement with the USACE for the Lower Brush Creek Ecosystem Restoration Feasibility Study in February 2019.

Through Section 1135 of the **Water Resources Development Act of 1986**, USACE will review the need to modify any portions of Brush Creek between the Paseo Blvd. bridge and the confluence with the Blue River (inclusive of Lake of the Enshriners) in order to improve environmental quality and provide ecosystem restoration.

Potential modifications could:

- a) Address issues with sediment management within the Lake of the Enshriners
- b) Reduce goose habitat, while providing/improving habitat for native species of flora and fauna within and adjacent to the stream
- c) Improve water quality
- d) Provide ancillary improvements to flood control

The feasibility study will present potential solutions for ecosystem restoration, provide analysis of the costs, benefits, and environmental impacts of the alternatives, and recommend a selected plan. The City can subsequently elect to partner with the USACE to proceed with design and construction of the selected plan.

Next Step: KC Water will continue to partner with USACE to get the feasibility study completed.

8.b. BMP 2.

During the reporting period, KC Water was conducting an analysis for a pilot study in the Town Fork Creek watershed. This is part of the Town Fork Creek Phase II Watershed study, a federally cost-shared Section 22 Planning Assistance to state's study with the USACE Kansas City District. The analysis is to explore the feasibility of separating stormwater from a combined sewer system in the watershed, seeking alternative approaches using green infrastructure (e.g., bio-swales, bio-retentions) to manage and convey stormwater runoff. Conceptual BMPs were developed for a small pilot study area. Then, an initial hydrology and hydraulics modeling exercise was conducted using these BMPs to determine the feasibility of managing stormwater without the use of an extensive, subsurface storm sewer network.

Next Step: KC Water will complete the study in summer 2019 and evaluate the study result.

8.b. BMP 3.

KC Water is in the process of purchasing flood-prone commercial properties (400-600 W 103rd St.) abutting Indian Creek. The conditions of these properties, which occupy about 3.1 acres, were compromised by previous flooding. KC Water plans to demolish the buildings, remove the asphalt surface and convert the area into a green space with native landscaping.

Next Step: KC Water will continue to seek the opportunities to protect water quality in association with flood control projects.

Permit Ref. 8.c. Include the procedures required above or provide means to access the procedures in the SWMP document

Measureable Goal: Provide access to the required procedures

Status: Ongoing

8.c. BMP 1.

The 2019 SWMP includes the required procedures.

Next Step: The access to the required procedure will continue to be included in the future version of the SWMP.

9. Monitoring

Permit Ref. 9.a.i & ii. Collect stormwater samples from stormwater discharges for three storm events and at six locations

Measureable Goals: Stormwater samples are to be taken from runoff resulting from three qualified storm events at six designated locations

Status: The measurable goals were met.

9.a.i. & ii. BMP 1.

Monitoring was conducted at six designated locations for a minimum of three storm events that occurred at least one month apart. Monitoring included field measurements and sample collection. Samples were analyzed by KC Water Laboratory for physicochemical and microbiological parameters. All field sampling/measurements, sample handling, laboratory analysis, and data validation, as well as a quality assurance and quality control plan, follow the Standard Operational Procedure for the MS4 stormwater discharge monitoring program developed by the Department's laboratory.

Next Step: The City will continue to implement the monitoring program.

Permit Ref. 9.a.iii. Sample testing and recordkeeping

Measureable Goals: Complete sample testing; finalize the data; and conduct data analysis and interpretation.

Status: The measurable goals were met.

9.a.iii. BMP 1.

Samples were analyzed for the parameters required in the Permit. See TABLE 6 for a summary of the data results.

9.a.iii. BMP 2.

Storm event data records are maintained and include all analytical results, the date and duration (in hours) of the storm event(s), rainfall measurements or estimates (in inches) of the storm event that generated the runoff that was sampled, and the duration (in hours) between the storm event sampled and the end of the previous measurable (>0.1 inch rainfall) storm event.

TABLE 6. STORMWATER RUNOFF MONITORING DATA

Constituent	Units	Residential		Commercial		Industrial		Result Count	Detect Count	MDL**
		EMC Range	Avg.*	EMC Range	Avg.*	EMC Range	Avg.*			
Conductivity (Lab)	µS/cm	113-590	289	59-966	365	130-12,990	2,369	18	18	NA
pH	S.U.	7.1-8.3	7.6	7.3-8.6	7.9	6.8-8.6	7.9	18	18	NA
Chemical Oxygen Demand	mg/L	26-103	55	28-115	61	31-158	85	14	14	6.25
Biochemical Oxygen Demand (5-day)	mg/L	6-22	14	3-21	12	6-9	7	18	18	2
Total Suspended Solids	mg/L	11-120	71	7-97	45	163-301	102	18	18	8
Nitrate+Nitrite	mg/L	0.113-1.462	0.686	0.239-1.381	0.554	0.657-1.026	0.853	18	18	0.027
Nitrogen, total Kjeldahl	mg/L	0.9-3.6	1.7	0.1-2.1	1.2	0.5-2.0	1.4	18	18	0.283
Oil & Grease	mg/L	ND-2.4	1.0	ND-2.8	1.2	ND-2.7	1.7	18	7	1.4
Phosphorus, total	mg/L	0.19-0.83	0.46	0.10-0.33	0.19	0.10-0.45	0.26	18	18	0.016
Phosphorus, dissolved	mg/L	0.10-0.37	0.22	0.10-0.15	0.11	0.09-0.46	0.19	18	18	0.016
E. Coli	MPN/100 mL	1,246-101,700	31,612	323-24,196	7,894	97-19,863	6,815	18	18	1

* average is calculated based on detected values and half of the detection limits for those under their detection limits

** MDL (method detection limit)

***ND: the concentration of a specific parameter is below its detection limit.

Permit Ref. 9.b. Biological assessments

Measureable Goals: Conduct habitat assessment once per year; take biological samples once per year; complete sample identification; finalize data; and conduct data analysis utilizing contracted services.

Status: The measurable goals were associated with the old Permit.

9.b. BMP 1.

During the reporting period, KC Water maintained an existing collaborative agreement with the Columbia Environmental Research Center (CERC) of U.S. Geological Survey for implementing the bio-assessment program. The streams covered in the assessment include: East Fork Shoal Creek, Line Creek, Round Grove Creek, Brush Creek, Hickman Mills Creek, Searcy Creek, Buckeye Creek, North Brush Creek, Fishing River, Little Blue River, and Prairie Creek.

The CERC lab finalized the report for the samples collected in the fall of 2015 and Spring of 2016. It also completed sorting and processing the samples collected in 2017 and was conducting taxonomic identification and enumeration of macroinvertebrate specimens.

Results of the fall 2015 and spring 2016 sampling periods indicate that the previously observed trend in Missouri Stream Condition Index and fall score samples performing higher than expected and spring samples performing lower than expected is continuing. Overall, among the selected stream sites, some sites (e.g., North Brush Creek) are fully-supporting high biotic condition, others (Round Grove Creek) at or near the full and partial supporting boundary with intermediate biotic condition, and the remaining ones (Searcy Creek) with lower quality biotic condition and habitat are consistently rated partially-supporting or occasionally non-supporting.

Next step: KC Water will continue to work with CERC to complete the tasks set in compliance with the expired permit and listed in the existing agreements. KC Water will start to develop a sampling plan to address the current permit requirements.

Permit Ref. 9.c. Methodology of sample collection analysis

Measureable Goal: Will be addressed in the 2019 SWMP

Status: Ongoing

9.c. BMP 1.

The analytic methods utilized in sample testing are consistent with the methods specified in 40 CRF 136. Below is a list of the parameters and corresponding testing methods.

- Total suspended solids: SM 2540 D
- Specific conductivity: SM 2510 B
- Chemical oxygen demand: SM 5220 D
- Biochemical oxygen demand: SM5210 B
- Oil & grease: SM 5520 B
- *E. coli*. SM 9223A,B
- Total Kjeldahl nitrogen: SM 4500-Norg B
- Nitrate + nitrite: EPA 300.0
- Dissolved phosphorus, total phosphorus: SM 4500-P